IMPROVING MAIN CONTRACTORS' SITE COORDINATION IN THE HONG KONG BUILDING PROJECTS

by

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ABSTRACT

Construction industry is one of the main pillars of the economy of Hong Kong. Over the years, Hong Kong construction industry has earned a reputation for the rapid construction of quality high-rise first class building. It is a common practice of the main contractors to sublet most of their works to subcontractors in the HK building projects. The percentage gross value of main contract work performed by subcontractors increased from 57 per cent to 67 per cent during 1981 to 2005 according to government statistics for 2006 (Census and Statistics Department, 2007). It is anticipated that more numbers of subcontractors would be involved due to the rapid development of high-rise buildings in the last decade. As a result, the role of the main contractor has been gradually transformed from a constructor to a manager of subcontractors of the projects. The performance of the subcontractors is one of the most important factors governing project performance.

In recent years, there are increasing complaints from subcontractors that they cannot performance effectively and efficiently due to poor site coordination by main contractors. An average of 35.10 per cent of productivity wasted due to site coordination problems caused by main contractors was stated by the respondents of a questionnaire survey. The aim of this thesis is to formulate relationships in terms of multiple regression equations to explain how the performance of subcontractors is affected by the critical site coordination problems caused by main contractors, and to develop framework to improve site coordination. The following objectives are defined to achieve the aim of the study.

a. Identify and review the common criteria currently used by main contractors to evaluate the performance of subcontractor in HK building projects.

b. Identity and review the important factors influencing the performance of subcontractors.

c. Identify and analyze the critical site coordination problems caused by main contractors that adversely affect the performance of subcontractors.

d. Identity and analyze the essential causes of the site coordination problems.

e. Investigate how the site coordination problems affect subcontractors' performance.

f. Develop a framework and recommend actions to enhance site coordination leading to improved subcontractor performance.

The research findings were based upon literature surveys, well-structured in-depth interviews and questionnaire surveys. From these, this research produced the following achievements.

a. Through questionnaire survey, time, cost, quality, and safety and health are identified as the four principal criteria currently used by the main contractors to assess the performance of their subcontractors in the HK building projects.

b. Site coordination was identified as the most important factor governing subcontractors' performance through a series of well-structured in-depth interviews to industrial practitioners.

c. Six critical site coordination problems that have adversely impact to subcontractors' performance were identified and reviewed through questionnaire survey.

d. Twelve essential causes of the site coordination problems were identified and reviewed through questionnaire survey.

e. Twelve multiple regression equations for different type of subcontractors were generated by SPSS software that explain how the six critical site coordination problems affected subcontractors' performance.

f. Six multiple regression equations were generated to explain the contributions of the twelve essential causes to the six critical site coordination problems.

g. Eight 'most essential' causes of the four 'most critical' site coordination problems were identified through backward elimination multiple regression analysis method. A series of figures were constructed to link the 'most essential' causes to the site coordination problems and then to the project performance of subcontracts, that serve as a framework to main contractor to formulate strategy to improve their site coordination.

h. Based on the framework, four possible actions were recommended to main contractors to improve the site coordination.

CERTIFICATE OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this thesis, and that neither the thesis nor the original work contained therein has been submitted in support of an application for another degree or qualification at this or any other university or other institution of learning.

ACKNOWLEDGEMENT

My heartfelt thanks is expressed to my supervisor, Professor A. D. F. Price for his continuous encourage, excellent guidance and valuable advice in the development of this thesis. Although he has already been very busy in his teaching work, he has still assigned a lot of his time to supervise my work without any hesitation. Without his thoughtful comments and close supervision, my thesis would not be completed.

I would also express my thanks to the interviewees for sharing their views with me and my friends who have helped to distribute and collect the questionnaire.

I am very grateful to the continuous support of my wife Marine and my daughter Wing-Sum for tolerating me through this research.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction to subject matter

1.1.1 Construction industry today

Construction industry is one of the main pillars of Hong Kong's economy. It employed eight per cent of approximately three million working population and contributed to 3.4 per cent of Hong Kong's GDP according to government statistics for 2005 (Census and Statistics Department, 2006). As of June 2006, the industry employed 52,000 site workers. The employment level for the broader building, construction and real estate sectors is at around 250,000 and includes professionals such as architects, surveyors, structural engineers, building services engineers and civil engineers. The value of construction work performed by main contractors in the second quarter of 2006 was HK$22.4 billion. Public sector work accounted for 39.5 per cent of that gross construction work. Over the next five years, the Hong Kong Government has earmarked $29 billion a year on average for public projects expecting to create about 14,000 new construction jobs in 2006/07. As the prosperity of the economy of Hong Kong and its growth is heavily dependent upon the state of the construction industry, construction industry can be seen as a barometer of the Hong Kong' economy (Rowlinson and Walker, 1995).

Over the years, Hong Kong construction industry has earned a reputation for the rapid construction of quality high-rise first class buildings such as the 88-storey height

International Finance Centre II and the 62-storey Cheung Kong Centre. The industry is dominated by a small number of large local contractors and overseas contractors. A substantial number of companies are being both developers and contractors. Due to fluctuation of workload, there is a high level of subcontracting in the projects. Most of the local construction companies are small in size, about 97 per cent of them had less than HK$10 million gross value of construction work performed in 2004 (Hong Kong Trade Development Council, 2006). The majority of them are performing subcontractor role in the building projects.

1.1.2 Subcontracting system

Subcontracting system is very important to the local construction industry as labour-only subcontractors and fee subcontractors contributed 23 per cent and 44 per cent of the gross value of construction work performed in 2005 according to government statistics for 2005. Main contractors normally divide the project into work packages by trade and sublet them to the first layer trade subcontractors. The first layer trade subcontractors further divide their work packages into smaller packages and sublet them to the second layer subcontractors. The subletting process may sometimes go down several more layers and can be characterised as multilayered subcontracting. The workers actually tend not be employees of the first layer subcontractors, however, according to the principle of ultimate responsible, the first layer subcontractors should be accounted for the performance of their sub-subcontractors. A survey (Cheng and Law, 2005) to review the degree of subcontracting shows that 74 per cent, 15.6 per cent and 4.2 per cent of the respondents were usual second layer, third and fourth layer subcontractors.

This approach has been in operation for a long period of time in Hong Kong as a strategy to deal with long-term environmental uncertainties and to buffer the technical core of main contractors against short-term contingencies (Sozen, 1999). However, the approach creates problems, such as greater demand in coordination work and high mobility of the worker causing poor workmanship.

Due to the rapid development in terms of complexity and size of building projects, the use of subcontractors has rapidly increased. As a result, the role of main contractors have gradually transformed from a constructor to a manager of subcontractors of the project. Frisby (1990) defined the management of the subcontractors as one of the key functions of the main contractor. The performance of the subcontractor is one of the most important factors governing project performance.

1.1.3 Management of subcontractors

The subcontractor is an independent company and not an employee of the general contractor. It is necessary to establish and maintain a firm, but cooperative relationship with subcontractors to encourage such co-operation enables all parties to make money on the project, and can lead to other mutual benefits as well (Frisby, 1990). Unfortunately, most subcontractors in Hong Kong complain that they are unable to efficiently and effectively perform their site works due to the main contractors' poor site coordination. A survey has been conducted to identify the essential factors affecting the performance of the subcontractors in the building construction projects in Hong Kong. The key influencing factors identified can be classified into three main categories:

a. inherent project characteristics;

b. ability of the key participants; and

c. the influences of the participants to the subcontracts.

The survey showed that main contractor's site coordination was the most important factor governing the performance of subcontractors during the construction stage.

A survey to identify and rank the importance of the common site coordination problems caused by the main contractors that hinder subcontractors' performance has been developed. The survey results recommended that as a priority main contractors should improve the quality of construction information provided to subcontractors and ensure that the scope of interfacing works for each subcontract were clearly specified in the subcontract documents and well coordinated through the regular site meetings.

Nineteen common site coordination problems caused by the main contractors that can adversely affect subcontractors' performance were identified through literature review and advices from experienced industrial practitioners. According to their nature, these problems were classified into eight groups of problems critical to the successful site coordination of subcontractors work:

a. construction information;

b. working programme;

c. preparation for work place;

d. interfacing work;

e. material support;

f. plant support;

g. response to site problems; and

h. access to work place.

A follow-up questionnaire survey was conducted that filtered the nineteen common problems into six critical site coordination problems for detail study.

Sixteen key causes of site coordination problems relating to the main contractors were identified through literature review and advice from experienced industrial practitioners. According to their nature, these causes were classified into three groups of causes essential to the site coordination problems:

a. staffing;

b. technical; and

c. management system.

A follow-up questionnaire survey was conducted that filtered the sixteen key causes into twelve essential causes to the site coordination problems for detail study.

This thesis explains the impact of the site coordination problems to the performance of subcontractors and analysis the essential causes of the problems in the Hong Kong building projects.

1.2 Aim and objectives

1.2.1 Aim

The aim of this research is to establish the relationships between site coordination problems caused by main contractors and performance of subcontractors at the construction stage in the Hong Kong building projects. This involves an analysis of the essential causes of the problems and provides guidelines to main contractors to enhance their site coordination. The aim will be achieved through the following objectives.

1.2.2 Objectives

a. Identify and review the common criteria to evaluate the performance of subcontractors currently used by the main contractors in HK building projects.

b. Identify and review the important factors governing the performance of subcontractors.

c. Identify and analyse the critical site coordination problems caused by main contractors that adversely affect the performance of subcontractors.

d. Identify and analyse the essential causes of the site coordination problems.

e. Investigate how the site coordination problems affect the performance of subcontractors.

f. Develop a framework and recommend actions to main contractors for improving site coordination.

1.2.3 Scope of study

This thesis only covers building construction projects as civil engineering main contractors do not subcontract such a large proportion of work to subcontractors since the nature of work does not involve as many different trades and is not too labour intensive.

1.2.4 Assumptions

Some of the respondents of the surveys of this research may perform the role of main contractor and subcontractor in different projects. In the surveys of this research, respondents were requested to fill the questionnaires according to their roles in their current projects or the projects with highest contract sums if they were handling several projects at the same time.

Some of the respondents may be the second, third or even lower layer of subcontractors in a project. In the surveys, it was assumed that their replies represented the views from the first layer subcontractors as long as they were the party actually carrying out the production work for the project.

1.3 Justification for the research

1.3.1 Increasing involvement of subcontractors

A survey by Lai (1987) showed that the average number of subcontractors involved in HK projects ranged from 17 to 54. It is expected that more numbers of subcontractors would be involved in a project due to rapid development of high-rise buildings in the last decade. The percentage gross value of main contract work performed by subcontractors increased from 57 per cent to 67 per cent during 1981 to 2005 according to government statistics for 2006 (Census and Statistics Department, 2007). The site coordination of subcontractors has thus become extremely complicate and enhancing main contractors' site coordination has become a priority.

1.3.2 Feedback from industry

In recent years, there are increasing complaints from the subcontractors that they cannot perform their work effectively and efficiently due to the site coordination problems caused by main contractors. A questionnaire survey was conducted to investigate whether the site coordination problems have seriously affected the productivity of the subcontractors. Data collection using a questionnaire survey in which respondents were requested their views on the amount of productivity that had been wasted due poor site coordination by the main contractor of their current projects. A total of 197 valid replies were received from main contractors, subcontractors, consultants and property developers in this questionnaire survey. A copy of the questionnaire and the summary of the replies are attached as Appendix A and B respectively. The survey findings can be regarded as a manifestation of the common views of the industry as the mean working experience in the construction industry of the respondents is around 10 years. The productivity wasted due to site coordination problems was stated by the respondents as an average of 35.10 per cent. Table 1.1 summarises the mean percentage of productivity waste stated by different groups of respondents in a descending order of priority. The results show that the performance of subcontractors on structural work could be seriously hindered by the site coordination problems. The main reason is that the nature of structural work is not easy to accommodate the re-schedule of working sequences to mitigate the impact of problems. It is not surprised that the mean percentage of the main contractor group is the lowest in this survey, however, they still admit that almost 20 per cent of the productivity had been wasted due to site problems even they might make a one-sided judgement when filling the questionnaire.

Table 1.1: Productivity waste

Characteristics of the respondents	No. of replies	Mean (per cent)
Subcontractor – builders' work (structural work)	34	45.88
Subcontractor – building services work	40	41.00
Consultants and property developers	25	39.36
Subcontractor – builders' work (finishes work)	43	38.09
Main contractor	55	19.87
Total	197	35.10

1.3.3 Government concern

The Hong Kong Government appointed the Construction Industry Review Committee to comprehensively review the current state of the industry and to recommend improvement measures in April 2000. The report by the Committee published in January 2001 stated that multilayered subcontracting has frequently been cited as a key factor contributing to substandard work in local construction because of the following reasons.

a. Most of the subcontractors, especially those at the lower tiers in the multilayered subcontracting system, do not enter into the formal subcontracts with the main contractors. This increases the difficulties for the main contractors in exercising adequate direct control and supervision over subcontractors' work.

b. Broker-type subcontracting creates multiple, non value-adding layers in the project delivery team, complicates communications.

c. Inadequate main contractor site supervision had aggregated the problem of multilayer subcontracting.

The *Public Policy Working Paper: Working Situations of Subcontractors and Their Employees under the Multilayer Subcontracting of Construction Works and Its Impacts on Construction Industry* (Cheng and Law, 2005) summarises the problems of extensive subcontracting such as difficulties in supervision and management and recommends the main contractors to enhance their subcontractors management system that clearly record all the subcontracting activities on their sites and inform their clients of such records.

1.4 Overview of research methodology

The aim of this thesis is to formulate relationships to illustrate how the performance of subcontractors is affected by the site coordination problems and develop framework to improve site coordination. Figure 1.1 gives a brief picture on the essential content of this research.

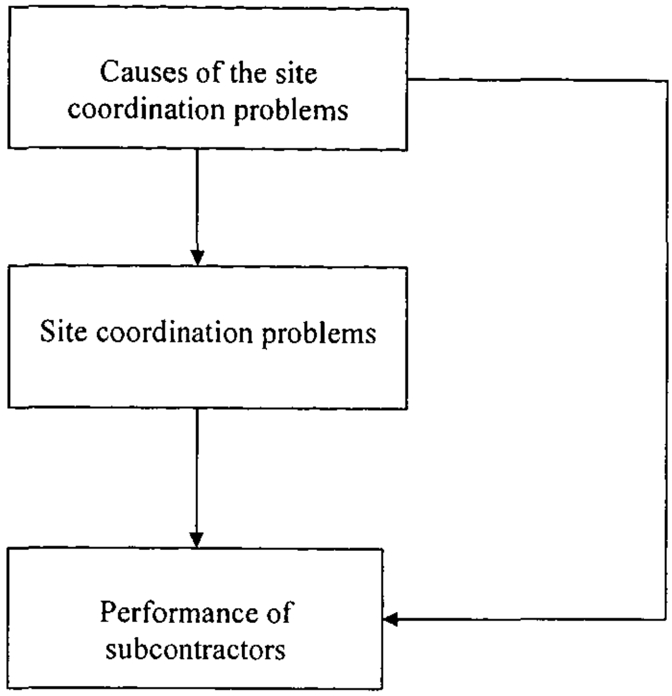

Figure 1.1: Outline of the theoretical framework

In each stage of study, the work was divided into two phases. The aim of the first phase was to consolidate a preliminary list of causes, problems and performance evaluation criteria through literature review and advices from experienced industry practitioners. The aim of second phase was to identify the important items from the preliminary list through in-depth interviews or questionnaire surveys.

Based on the results of the studies, a questionnaire survey was formulated to collect data for establishing the relationships and analyzing the essential causes to the site coordination problems. The below briefly describes the content of each stage of research work.

Stage One: Measuring the performance of subcontractors

In recent years, broader project objectives are being introduced to assess the performance of the main contractors of building projects. This stage of work aimed to establish the criteria that main contractors were currently using to evaluate the performance of their subcontractors. After the consultation with experienced industrial practitioners, essential subcontractor performance evaluation criteria were shortlisted and categorised into seven objectives. A questionnaire survey was conducted and used to rank the importance of these objectives. The survey results show that time, safety and health, quality and cost are the four current principal construction project objectives for subcontracts.

Stage Two: Factors influencing the performance of subcontractor

In this stage, factors influencing subcontractors' performance for the Hong Kong building projects were reviewed. A preliminary list of factors was prepared based on previous studies of success factors for building projects because there were no similar studies relating to subcontractors. These factors were grouped into three main categories. Through the in-depth interviews to the industrial practitioners, the ten most important factors were shortlisted. Site coordination was found to be the most important factor under the category of influences of the participants to the subcontracts.

Stage Three: Site coordination problems

The critical site coordination problems caused by main contractors that can hinder subcontractor performance were identified and analysed in this stage. Nineteen common problems were identified and classified into eight groups through literature review, observed common industrial practices and advices from the experienced industrial practitioners. A questionnaire survey was conducted to rank the importance of the problems to the performance of the subcontractors.

Stage Four: Causes of site coordination problems

The essential causes of the site coordination were identified and analysed in this stage. Sixteen possible causes were identified and classified into three groups through observed common industrial practices and advices from the experienced industrial practitioners. A questionnaire survey was carried out to examine the contributions of the causes to the site coordination problems.

Stage Five: Forecasting the performance of subcontractors

Relationships to explain how the site coordination problems affect the performance of subcontractors were established in this stage. A questionnaire survey was developed based on the six critical site coordination problems as identified in the previous stages of work and the three principal project outcomes: time; cost; and quality. Multiple regression analysis method and neural network analysis method were used to generate the regression equations to relate the site coordination problems with the performance of subcontractors.

Stage Six: Contribution of the causes to site coordination problems

Questionnaire survey method was adopted to collect data to investigate the contributions of the twelve essential causes identified in the previous chapter to the six critical site coordination problems. Multiple regression analysis method and neural network analysis method were used to formulate the regression equations to relate the causes to the site coordination problems.

Stage Seven: Improving the site coordination

Among the six critical site coordination problems, some of them bear more impact than others on the time, cost and quality performance of the subcontracts. Backward elimination multiple regression method was adopted to identify the 'most critical' site coordination problems to subcontractors' performance. Similarly, the 'most essential' causes to the critical site coordination problems were identified from the twelve essential causes adopting the backward regression multiple regression method. This provides the main contractors the information to develop framework to improve the site coordination.

1.5 Summary of main findings

1.5.1 Relationship to explain the performance of subcontractors

Relationships based on the occurrence of the six critical site coordination problems caused by main contractor, in terms of multiple regression equation format shown in Equation 1.1, was developed to explain the degree of achievement in time performance, cost performance and quality performance of the subcontractors in the HK building projects. In this analysis, a total of 12 regression equations were formulated for different type of sub-contractors. Table 1.2 is an extract of the analysis that lists the three regression equations formulated based on the replies from all types of sub-contractors.

$$P = A + W_1SCP1 + W_2SCP2 + W_3SCP3 + W_4SCP4 + W_5SCP5 + W_6SCP6$$

Equation 1.1: Regression equation to explain the performance of subcontractors

Where $P_{T,}$ P_C P_Q is the project performance: Time, Cost and Quality.

SCP1 to SCP6 are the critical site coordination problems.

W_1 to W_2 are the partial regression coefficient for SCP1 to SCP2 respectively.

A is a constant which is the y-intercept of the equation.

Table 1.2: Regression equations to analyze the performance of subcontractors

Project performance	**Regression equation**
Time	P_T= 11.645 - 0.229xSCP1 - 0.343xSCP2 - 0.314xSCP3 - 0.031xSCP4 + 0.001xSCP5 - 0.068xSCP6
Cost	P_C = 9.522 + 0.015xSCP1 - 0.040xSCP2 - 0.308xSCP3 - 0.162xSCP4 + 0.084xSCP5 - 0.087xSCP6
Quality	P_Q = 10.564 – 0.160xSCP1 - 0.096xSCP2 - 0.283xSCP3 - 0.094xSCP4 - 0.024xSCP5 - 0.002xSCP6

1.5.2 Framework to improve site coordination

Eight 'most essential' causes to the 'most critical' site coordination problems which consequently affected the performance of subcontractors were summarized below. Based on the information, main contractor can formulate measures to avoid the occurrence of the causes in order to provide efficient and effective site coordination for their subcontractors.

a. Staff the main contractor are too inexperienced to coordinate the site work.

b. Main contractor does not have sufficient directly employed workers to carry out the temporary work.

c. Design of the temporary work provided by main contractor does not meet the requirements requested by the sub-contractors.

d. Job duties of main contractor's staff are unclear.

e. Main contractor does not have sufficient staff to coordinate the site work.

f. Main contractor does not have sufficient staff to coordinate the technical administration work.

g. Communication paths within main contractor organization are unclear.

h. Frontline staff of main contractor do not have sufficient authority to handle the site co-ordination.

1.6 Guide to the thesis

This thesis contains ten chapters. The schematic guide to the thesis layout is illustrated in Figure 1.2. A brief description of each chapter is presented below to summarize the thesis.

Chapter One provides an introduction to the subject matter, aims and objectives and justification for the research. Overview of the research methodology, summary of the main findings and the guide to the thesis are also presented.

Chapter Two analyses the nature of the research topic, and explains the research philosophy and the structure of the research methodology. The selection, strengths and limitations of the data analysis tools adopted for establishing the forecasting model are discussed.

Chapter Three provides a literature review on the knowledge in the context of the research topic. It critiques the publications on strengths and problems of subcontracting, objectives of building projects, success factors for building projects, and applications of multiple regress analysis and neural network analysis.

Chapter Four explains the methodology and approaches adopted for data collection for this research. The designs for the questionnaire surveys are discussed in detail in this chapter.

Chapter Five describes the common project objectives for main contracts of building project, and presents the questionnaire survey that concluded the common criteria that main contractors are currently using to assess the performance of their subcontractors in the HK building projects.

Chapter Six reviews the critical success factors for building projects, and explains the process that identifies the important factors governing the performance of subcontractors in the local building projects through in-depth interviews to industrial practitioners.

Chapter Seven analyses the critical site coordination problems caused by main contractors. The results of the questionnaire survey have been presented in tables and bar charts and the importance of these problems to the performance of subcontractors has been analysed. Explanations from industrial practitioners on the survey results are presented.

Chapter Eight summarizes the essential causes of site coordination problems. The results of the questionnaire survey that rank the importance of these causes to the problems have been presented in tables and bar charts with explanations.

Chapter Nine presents the questionnaire survey and explain the relationships between the outcomes of a subcontract and the critical site coordination problems. Data analyses by means of multiple regression analysis and neural networking analysis have been included in this chapter.

Chapter Ten presents the questionnaire survey and determine the contributions of the essential causes to the critical site coordination problems. Data analyses by means of multiple regression analysis and neural networking analysis have been included in this chapter.

Chapter Eleven presents a series of figures to illustrate the influences of the 'most essential' causes to the 'most critical' site coordination problems, and subsequently to the three principal project outcomes of the subcontracts in HK building projects based on the survey results of Chapter Nine and Chapter Ten.

Chapter Twelve concludes the findings of this thesis and summarizes the recommendations to main contractors to enhance the site coordination. The room for further study of this research area are also explored and discussed in this chapter.

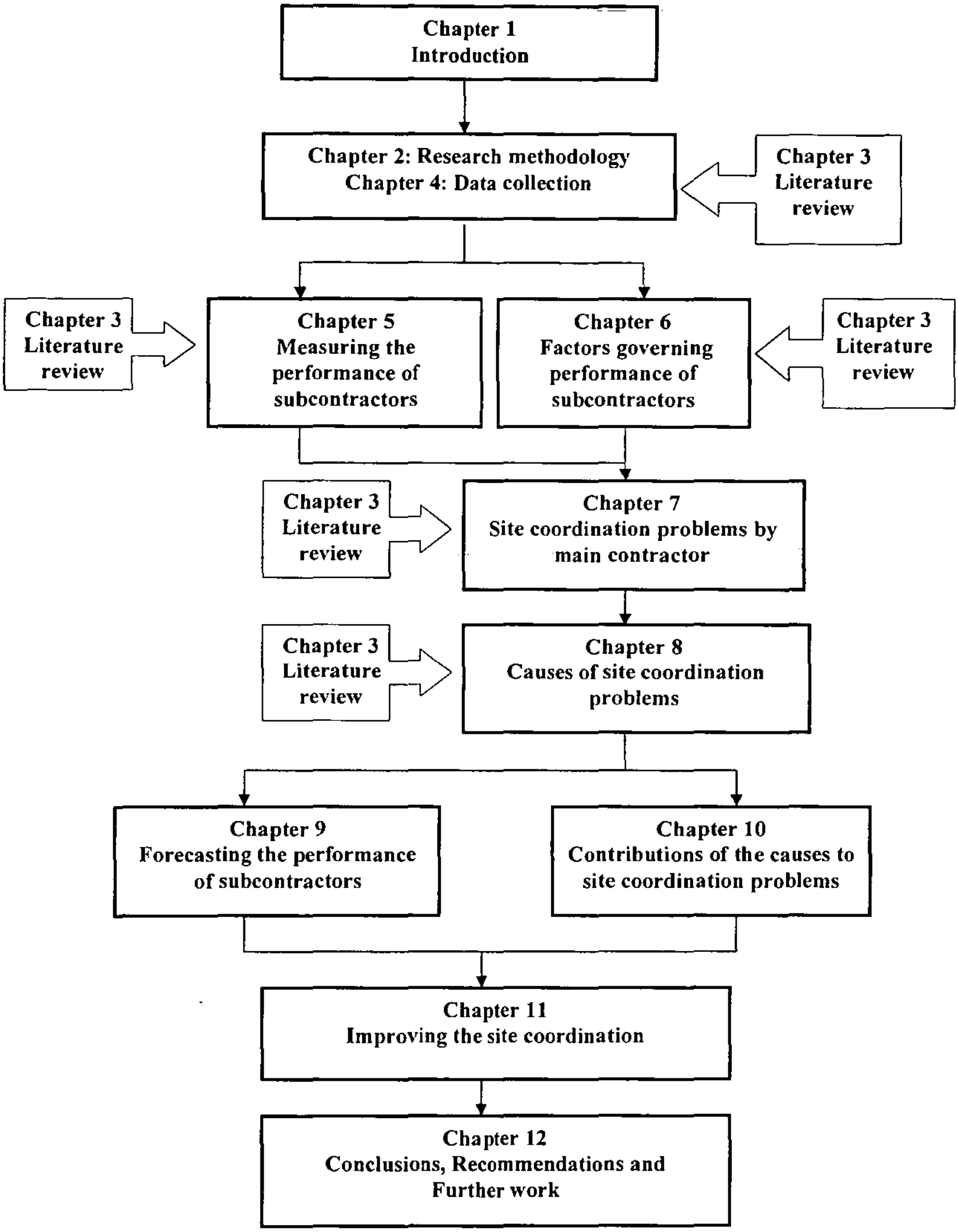

Figure 1.2: Thesis layout

CHAPTER TWO

RESEARCH DESGIN AND METHDOLOGY

2.1 Introduction

This chapter explains the adopted research methodology which was based on the research process model for basic and applied research as proposed by Sekaran (1992). This comprises the following major steps.

a. Observations: Identify the broad areas of research interest.

b. Problem definition: Delineate the research problems.

c. Research topic definition: Define the aim and objectives of the research.

d. Theoretical framework: Identify the input variables and outputs, and construct their relationships.

e. Research design: Design the data collection methods and the flow of the research work.

f. Data analysis and interpretation: Select appropriate statistical models and software programmes for data analysis; and interpretation of the results and formulate recommendations.

The common problems of building projects in Hong Kong were reviewed through a preliminary literature review and observations of industrial practices. One essential problem identified was the unsatisfactory performance of subcontractors. A researchable topic that could make contribution to the industry was thus formulated: improving the performance of subcontractors through proper site coordination.

The research aim was established through the discussions with experienced industrial practitioners which covered two major areas: the impact of site coordination problems on subcontractor performance; and the causes of poor site coordination. Six research objectives were developed based on the research aim. A detail literature review was undertaken to consolidate the list of the influencing factors and outputs of subcontracts. The research focused on studying the influences of site coordination problems on subcontractor's performance and the causes of such problems. The theoretical framework of this research has been presented in Figure 2.1 (see page 47). The research work was divided into seven stages of studies. Multiple regression analysis and neural network analysis were adopted to analyze the data as literature review had suggested that these two methods were commonly used in studies of similar nature.

2.2 Broad areas of research interest

The first step in most research exercises is to identify broad areas of research interest. Hong Kong construction projects have long been associated with poor quality of workmanship (Tam and Tong, 1996; Kam and Tang 1998). It is commonly agreed within the industry that multilayered subcontracting is one of the main causes of this problem. A preliminary literature review was undertaken to explore supporting publications. One essential document was identified: the Construction Industry Review Committee Report (2001) which reviewed the current state of the industry. The report cited the multi-layered subcontracting system as a key factor contributing to substandard work in local construction. It would therefore be interesting to study the issues related to the management of subcontractors.

2.3 Delineate the research problem

The research problem was delineated through the discussions with experienced industry practitioners and a preliminary literature review. Due to rapid development of high-rise buildings in Hong Kong in recent years, the involvement of subcontractors in building projects has rapidly increased. However, there has been increasing complaints from the subcontractors that they could not perform effectively and efficiently due poor site coordination by main contractor.

Questionnaire survey method was adopted to justify the research problem. In the survey, respondents were requested to quote a percentage to represent their views on the amount of productivity wasted due to poor site coordination by main contractor. As the survey result showed there was an average of 35.10 per cent wasted productivity claimed by the respondents, a further step was worth to proceed to finalize the research aim, objectives and scope of study.

2.4 Research aim and objectives

The research aim and objectives of the study were formulated taking into account of the follow four criteria defined by Sternberg (1981).

a. Does it make a contribution to the field?

b. Is it original?

c. Is it researchable?

d. Is it dealing with unpopular ideologies or stigmatized or illegal groups?

Subcontracting is an important feature of the Hong Kong construction industry, for example, in 2005 subcontractors performed 67 per cent of the gross value of main contract according to government statistics (Census and Statistics Department, 2006). The findings of this research should thus contribute to the advancement of the local construction industry.

The management of subcontractors is a very complicate issue. The preliminary literature review shows that there are lots of publications focused on the pre-contract matters. However, there is lack of research directly related to the management of subcontractors at the construction stage. This research could fill up the 'hole' of the recent studies and produce an 'original' work in this study area.

This research topic is supported by the industrial practitioners and is researchable as the data to formulate the subcontractors' performance regression equations and the framework to enhance the site coordination could be obtained from the industrial practitioners through questionnaire survey.

The aim of this research is to establish the relationships between the site coordination problems caused by main contractors and the performance of subcontractors at the construction stage in the Hong Kong building projects. This study involves an analysis of the essential causes of the problems so as to recommend improvements to main contractors to enhance site coordination. The following objectives are defined to achieve the aim of this study:

a. Identify and review the common criteria currently used by main contractors to evaluate the performance of subcontractor in HK building projects.

g. Identity and review the important factors influencing the performance of subcontractors.

h. Identify and analyze the critical site coordination problems caused by main contractors that adversely affect the performance of subcontractors.

i. Identity and analyze the essential causes of the site coordination problems.

j. Investigate how the site coordination problems affect subcontractors' performance.

k. Develop a framework and recommend actions to enhance site coordination leading to improved subcontractor performance.

2.4.1 Scope of study

This thesis only covers building projects as civil engineering projects are not as labour intensive and involves fewer trades. As a result, civil engineering contractors do not subcontract their work to the same degree.

2.4.2 Assumptions

Some of the survey respondents had working experience in main contractors as well as subcontractors. Some of them were also handling several projects at the same time. They also performed the role of main contractor and subcontractor in different projects. From stage one to stage four studies, respondents were requested to complete the questionnaire based on their working experience. From stage five to stage seven studies, respondents were requested to provide data for their current projects or the projects with highest contract sums of their current projects.

Subcontractors are usually small firms. They work on different projects at different levels of subcontracting. It is pointless and perhaps impossible to trace out the level of subcontracting they belonged to. It was thus assumed that their replies represented the views from the first layer subcontractors as long as they were the parties actually carrying out the production work for the project.

2.5 Theoretical framework

This section defines the dependent variables and independent variables of the regression equations in this research, and constructs their relationships. This research work comprised two main parts:

2.5.1 Subcontractor performance analysis

The first part aimed to explain how site coordination problems affect the performance of the subcontractors. The dependent variables of the regression equations were the outcomes of the subcontracts, i.e. the essential criteria used to evaluate the performance of subcontractors currently used by the main contractors in HK building projects. The independent variables of the regression equations were the site coordination problems caused by main contractors.

2.5.2 Improving the site coordination

The second part of the research was to establish a framework to improve the site coordination by analyzing the causes of the site coordination problems. Site coordination problems thus became the dependent variables of the regression equation for the second part research while the causes of the site coordination problems related to main contractor internal factors were the independent variables.

Table 2.1 and Figure 2.2 summarize and illustrate the relationships of the dependent variables and independent variables of the two parts of research.

Table 2.1: Summary of dependent variables and independent variables

Research work	Independent variables	Dependent variables
First part: Subcontractor performance analysis	Site coordination problems	Outcomes of subcontracts
Second part: Improving the site coordination	Causes of site coordination problems	Site coordination problems

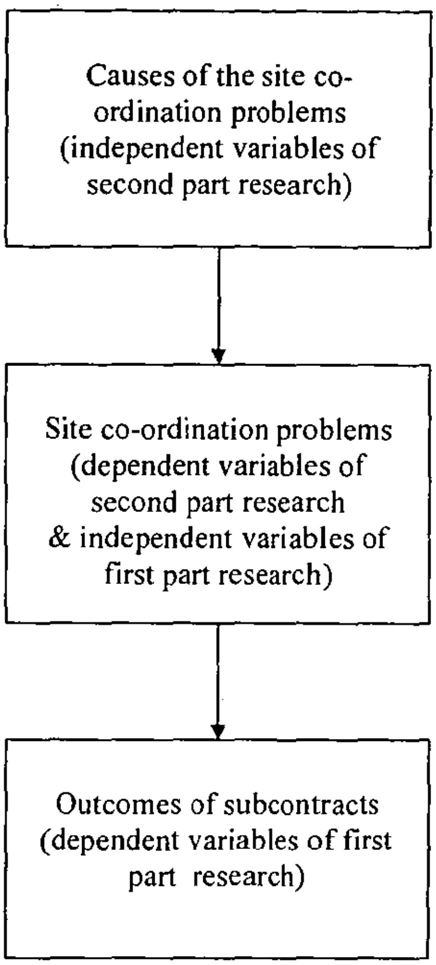

Figure 2.2 Relationships of dependent variables and independent variables

2.6 Research design

To meet the research objectives, this research was undertaken in the following seven stages. Figure 2.3 (see page 48) shows the flow of study for this research.

Stage One: Measuring the performance of subcontractors

Stage Two: Factor governing the performance of subcontractors

Stage Three: Site coordination problems

Stage Four: Causes of site coordination problems

Stage Five: Forecasting the performance of subcontractors

Stage Six: Contribution of the causes to site coordination problems

Stage Seven: Improving the site coordination

Stage One to Four each involved two phases of works. The aim of the first phase work was to consolidate a preliminary list of causes, success factors, problems and performance evaluation criteria through literature review, advices from experienced industrial practitioners and observations. The aim of second phase work was to shortlist the essential items from the preliminary list through in-depth interviews or questionnaire surveys for constructing the subcontractor's performance relationships and site coordination enhancement framework in Stage Seven work. The following paragraphs explain the detail design of each stage of work.

Stage One: Measuring the performance of subcontractors

The definition of the dependent variables is the first to be finalized before selecting the independent variables of the regression equations. The outcomes of a project are reflected by the criteria used to assess the performance of the firm undertaking the project. Thus, the first stage of this research was to identify and review the essential criteria that main contractors were currently using to evaluate the performance of their subcontractors in HK building projects.

A literature review was undertaken to analyze the different approaches to assess the outcomes of project. Twenty-two essential criteria to evaluate the performance of subcontractors of building projects were shortlisted through the consultations with the experienced industrial practitioners. According their nature, these criteria were classified into the following seven project objectives:

a. time;

b. cost;

c. quality;

d. safety and health;

e. potential for long-term development;

f. sustainability; and

g. public image.

An integrated research approach was adopted including: a questionnaire survey to collect quantitative data; and in-depths interview to explore the possible causes for the findings. In the questionnaire survey, respondents who had worked in main contracting firms were requested to rate the level of importance from 1 (very important) to 7 (very unimportant) with 0.5 interval to the performance assessment criteria. The questionnaires were randomly distributed through private relationship to the industrial practitioners. A copy of the questionnaire is attached as Appendix C.

The importance of each criterion in assessing subcontractor performance was reflected by the mean score as assigned by the respondents. In this study, it was assumed that all the criteria were of equal importance to their respective performance evaluation objectives. Thus, the score for the performance evaluation objectives was the mean of the score of the criteria in the same group. The score of the objectives were summarized and presented in a descending order of levels of importance. The results shown that time, safety and health, quality, and cost were far more important than the other project objectives for the subcontracts of HK building projects. Experienced construction managers of main contractor were subsequently invited to express their views on the survey data through interviews.

Only time, cost and quality were selected as the outputs for the model to explain how the site coordination problems affect the performance of the subcontractors. The main reasons were that they had already been concluded as the three traditional principal project objectives and their achievements in a project could easily be quantified.

Stage Two: Factors governing the performance of subcontractors

The aim of this stage was to identify and review the important factors influencing the performance of subcontractors. There is lack of information on the success factors for subcontracts. A literature review was conducted to identify the critical success factors at main contract level. Adopting the model developed by Tam and Harris (1996), success factors for subcontract were classified into the following three headings and their relationships are shown in Figure 2.1 (page 47):

a. **Inherent project characteristics**: the nature and complexity of the main contract and subcontract, and the relationship among the key participants;

b. **Ability of the key participants**: the knowledge, experience and financial abilities of the main contractor, design team, client and subcontractor, and the company support of their companies to the project; and

c. **Influences of the participants to the subcontracts:** the performance of the main contractor, design team, client and other subcontractors at construction stage.

A preliminary list of factors that can affect the performance of subcontractors was formulated based on the literature review and observations to industrial practices. In-depth interviews were adopted because they permit the interviewees to suggest other factors that had not yet included in the preliminary list.

Three construction managers and three foremen from the main contractors were interviewed to express the points of view from management and frontline staff respectively. In order to obtain the views from different side, three project officers of the subcontractors were also interviewed. All the interviewees were from different firms. During the interviews, interviewees were reminded to refer only to the three basic project objectives, i.e. time, cost and quality, in making their options so as to maintain the consistence of the assumptions. Interviewees were requested a score from 1 (very unimportant) to 10 (very important) with 0.5 interview to each of the factors influencing the performance of the subcontractors and give a short explanation to support their options. According to the mean of score assigned by the interviewees, ten most important factors influencing the performance of subcontractors were identified, which showed that site coordination was the most important one at the construction stage.

Stage Three: Site coordination problems

Figure 2.4 shows the detail research work flow from Stage Three to Stage Seven study that illustrate the process from the consolidation of preliminary list of common site coordination problems and possible causes of the problems to the identification of 'most critical' site coordination problems and 'most essential' causes of the problems.

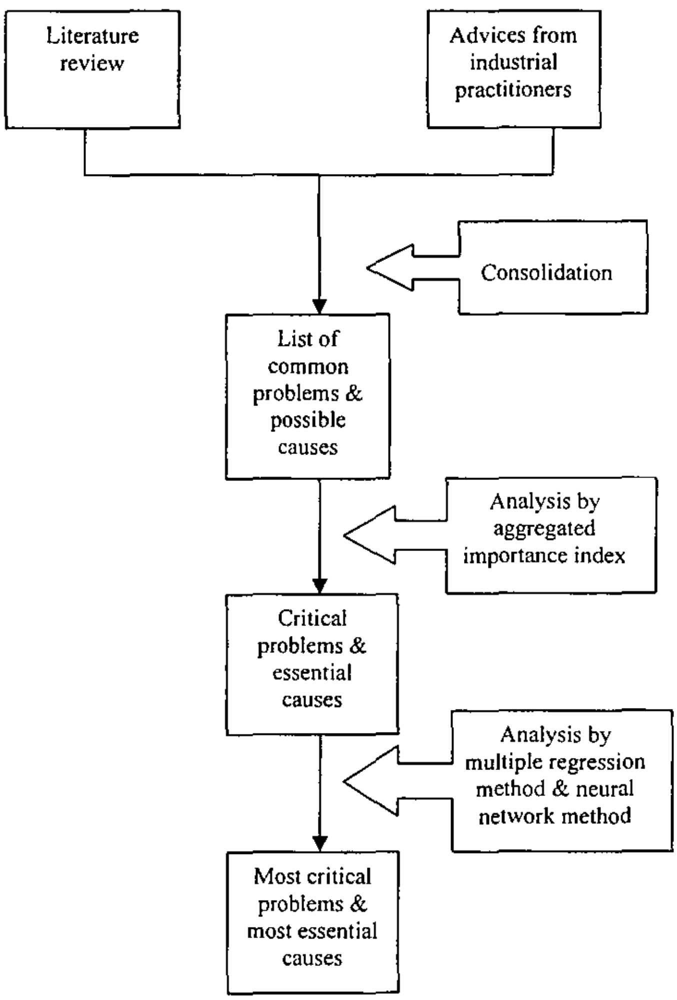

Figure 2.4: Research work flow from Stage Three to Stage Seven studies

The aim of Stage Three study was to identify and analyze the critical site coordination problems for establishing the subcontractors' performance regression equations. Nineteen problems caused by the main contractors that influence subcontractors' site work were identified through literature review, observed common industrial practices and advices from the experienced industrial practitioners. These problems were classified into the following eight groups:

a. construction information;

b. working programme;

c. preparation for work place;

d. interfacing works;

e. access to work place;

f. plant support;

g. material support; and

h. response to site problems.

An integrated research approach was adopted including a questionnaire survey to collect quantitative data and possible explanations to the survey results were collected through in-depth interviews. The overall degree of influence of the site coordination problems on subcontractors' performance depends on their frequency of occurrence as well as the potential degree of impact on site work. Based on their experience, respondents were requested to rate: from 1 (never happen) to 9 (happen every time) 0.5 intervals for the frequency of occurrence; and from 1 (very unimportant) to 9 (very important) with 0.5 intervals for the degree of potential impact to site work for each problem. In this 9-points scoring scaling system, score above 5 represented that the problem occurred fairly frequently and had significant impact to site works.

Kadir *et al* (2005) derived the Severity Index formula to rank the overall implications of each of the factors affecting construction labour productivity based on the model by Lim and Alum (1995).

Severity Index = Importance Index x Frequency Index

Importance Index = Mean score on the Importance of each of the factor

Frequency Index = Mean score on the Frequency of Occurrence of each of the factor

Based on the model by Kadir *et al* (2005), aggregated importance score for each site coordination problem was taken as the combined score of frequency of occurrence and the potential degree of impact to the performance of subcontractors. The questionnaires were randomly distributed through private relationship to the industrial practitioners. Score of six site coordination problems were higher than 25 and they were selected as the input variables for the subcontractors' performance analysis. A copy of the questionnaire is attached as Appendix D.

Stage Four: Causes of site coordination problems

There are many factors affecting main contractors' site coordination work and they are interrelated. Adopting the approach used in Stage Two study, these factors were classified into the following three headings:

a. **Performance of main contractor**, i.e. the contributions of the main contractors in managing the site coordination;

b. **Inherent project characteristics** including the nature and complexity of the main contract and subcontract, and the relationships among the key participants; and

c. **Performance of other participants to the subcontract** including the contributions made by client, design team and other subcontractors to the subcontract.

The aim of this stage was to identify and analyze the essential causes of the site coordination problems that related to the performance of main contractor. Sixteen causes were identified through literature review, observation of common practices and advices from the experienced industrial practitioners. These causes were classified into the following three groups according to their natures.

a. staffing;

b. technical; and

c. management system.

A questionnaire survey and in-depths interviews were conducted to collect quantitative data and explore the possible explanation for the findings respectively. The overall degree of contribution of the causes on site coordination problems depends on their frequency of occurrence as well as the potential degree of impact on site coordination problems. Based on their experience, respondents were requested to rate each identified causes in terms of: the degree of impact from 1 (very unimportant) to 9 (very important), with a 0.5 interval; and the frequency of occurrence in HK building projects from 1 (never happens) to 9 (happens every time), with a 0.5 interval. The causes with mean score over 5.0 were considered as to have significant impact to the site coordination problems and frequently occurring causes in the local building projects. Based on the model by Kadir *et al* (2005), aggregated importance score for each cause was taken as the combined score of frequency of occurrence and the potential degree of impact. Questionnaires were randomly distributed to industrial practitioners. Score of twelve essential causes were higher than 25 and they were selected as the input variables to establish the framework to enhance main contractors' site coordination. A copy of the questionnaire is attached as Appendix E.

Stage Five: Forecasting the performance of subcontractors

The aim of this stage of work was to establish mathematical relationships to explain how the site coordination problems affect the performance of the subcontractors. A questionnaire survey (see Appendix A) to serve the Stage Five and Stage Six studies was developed based on the three principal subcontractors' performance evaluation criteria, six critical site problems and twelve essential causes for the problems identified in the previous stages of work. In the survey, respondents were requested to define their roles and provide information based on their current projects or the projects with highest contract sum if they were handling several projects at the same time. If the respondents were working in main contractors, property developers and consultant firms, based on their current projects they were requested to rate: from 0 (never happen) to 10 (happen every time) with 0.5 interval for the frequency of occurrence for each of the six critical site coordination problems; and from 0 (very unimportant) to 10 (very important) with 0.5 interval for the degree of contribution of each of the twelve essential causes to the problems in their current projects at the time they filled the questionnaires. If the respondents were working in subcontractors, they were requested to rate: from 0 (0%) to 10 (100%) with 0.5 interval for the achievement of each of the three principal performance evaluation criteria in addition to the data for the frequency of occurrence of site coordination problems and causes of the problems in their current projects at the time they filled the questionnaire. Achievement of time, cost and quality in their projects were estimated by comparing the actual construction time with the planned programme, actual expenses with the budget, and workmanship with the contract specification respectively. The questionnaires were distributed to industrial practitioners through private relationship.

Kinnear and Gray (2000) classified the nature of the research work into the following five types for the selection of the appropriate statistical technique for data analysis.

a. Difference significant: For example, is resting heart rate the same before and after a fitness course?

b. Variable associated: For example, do tall parents tend to have tall children?

c. Prediction of scores or categories: For example, can university performance be predicted by aptitude tests?

d. Population parameters from a sample: For example: is a coin as likely to turn up heads as it is tails?

e. Latent variables: For example: can performance in a variety intellectual pursuits be accounted for in terms of general intelligence?

The nature of this research fits the condition of type Three described above. According the Figure 2.5, multiple regression method is thus considered as an appropriate approach for this study.

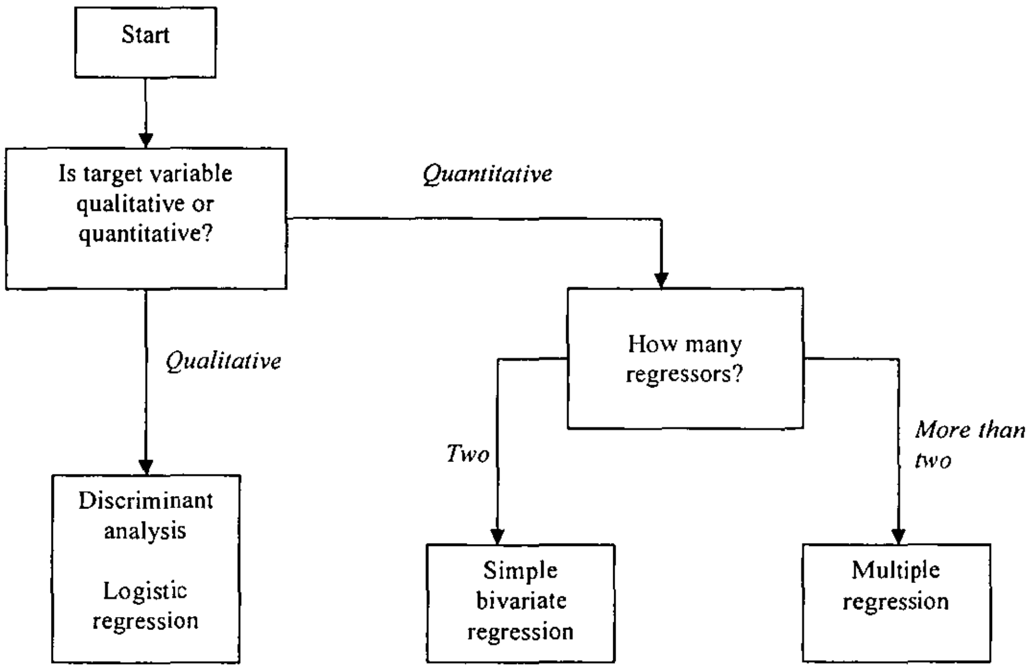

Figure 2.5: Statistical technique selection flow-chart (Kinnear and Gray, 2000)

Multiple regression method mainly deals with studies consisting of one dependent variable and many independent variables and is defined as:

$$y = a + b_0x_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + \ldots\ldots + b_kx_k$$

Where x_k is the independent variable

y is the dependent variable

a is a constant which is the y-intercept

b_k is the partial regression coefficient for x_k

Equation 2.1: Form of multiple regression equation

The following statistical tests were used to assess the errors, significance, reliability and validity of the of multiple regression equations generated.

a. Visual examination

Before estimating the coefficients of the regression line, it is necessary to make sure that the independent variables are linearly related to the dependent variable. If there are not, data have to be transformed by taking logs or square roots to ensure that the relationships are linear. A scatterplot matrix of the independent variables and the dependent variable can provide preliminary information on the relationships between the dependent variable and independent variables.

b. Testing hypothesis

If there is no relationship between the independent variables and the dependent variable, the regression coefficient should be equal to zero. The hypothesis is:

$H_0: = b_1 = b_2 = b_3 = b_4 = b_5 \ldots\ldots\ldots\ldots b_k = 0$

versa H_a: at least one b_k is not zero

The hypothesis can be tested by using the F-statistic. If the F-statistic is large and the observed significance level is small, the hypothesis that $b_k = 0$ is rejected. At least one of the regression coefficients is thus not 0.

c. Outliers

Extreme cases have considerable impact on the regression solution and should be deleted. Outliers were detected during data screening using Mahalanobis statistical method.

d. Fitting the regression model: The least–squares line

If all the points fall exactly on a straight line, it is not necessary to determine which line best summarizes the data points. There are many different lines that can be drawn through some of the data points. The least square method is used to fit the linear model for both the linear and multiple regressions. For each of the data points, the distance between the point and the regression line is calculated by drawing a vertical line from the point to the regression line. The sum of squared distances is the sum of the squared vertical distances between each of the points and the line. The best fit line is the one with the smallest sum of squared vertical distances between the points and the line.

e. The correlation coefficient

The statistic most frequently used for describing how well the model fits the data is the Pearson correlation coefficient (r). This method can provide an absolute measure that does not depend on the units of measurement and is easily interpretable. The correlation coefficient ranges from -1 to +1. If all of the points fall exactly on a line with a positive slope, the correlation coefficient has a value of +1. If all of the points fall exactly on a line with a negative slope, the correlation coefficient has a value of -1. The absolute value of the correlation coefficient describes how closely the points cluster around a straight line. Large value indicates a strong linear relationship between the variables- the points are close to the line. The correlation coefficient can be calculated using Equation 8.2

$$r = b \times (s_x/s_y)$$

where s_x and s_y are the standard deviations of the independent and dependent variables; b is the slope of the regression line.

Equation 2.2: Correlation coefficient equation

f. Methods for selecting variables

Many different models can be built up from the same set of independent variables. For example, 32 different models can be formulated from data comprising five independent variables and one dependent variable. The method that can reduce the number of computations is to add or remove variables from the regression equation sequentially. The decision to add or remove an independent variable is based in how much it changes with multiple R^2. Whenever an independent variable is added to the regression model, R^2 increases or remains the same. It never decreases when a variable is added. Similarly, R^2 decreases or remains the same when a variable is removed from the model.

Forward selection starts with a model that contains only the constant term. At each step, one variable is added that results in the largest increase in multiple R^2, provided that the change in R^2 is large enough to reject the null hypothesis. The process is stopped when there is no more variables that result in a significant increase in R^2.

Backward elimination starts with a model that contains all the independent variables. At each step, independent variable that changes R^2 least is removed, provided that the change is small enough so that null hypothesis cannot be rejected. The process is stopped when removal of any variable in the model results in a significant change in R^2.

Stepwise variable selection is a commonly used method that is a combination of forward selection and backward elimination. It resembles forward selection except that after a variable is added into the model, any variables already in the model that are no longer significant predictors are removed. This means that variables whose importance diminishes as additional predictors are added are removed. The process starts with entering the first two variables in the same way as in forward selection. Variables in the model are examined to see if either of them meets the removal criteria. If so, the variable is removed and a new variable using the same rules as in forward selection is added. The process is stopped when there is no more variables meet the entry criterion.

g. **Explaining the variability**

R is the absolute value of Pearson correlation coefficient (r). R Square is the square of the correlation coefficient that describes what proportion of the variability of the dependent variable is 'explained' by the regression model. Adjusted R Square is an estimate of how well the model fits another data set from the same population. Since the slope and the intercept are based on the values of the first set of data, the model fits the first set of data somewhere better than it would another sample of cases. The value of Adjusted R^2 is thus always smaller than the value of R^2.

The major conceptual limitation of all regression techniques is that one can only ascertain relationships, but never be sure about underlying causal mechanism. As for cross reference purpose, neural networks technique was adopted as it is an information processing technology that stimulates the human brain and the nervous system. Neural networks learn from experience, generalize from previous examples to new ones and abstract essential characteristics from inputs containing irrelevant data.

Three distinct components, Input Layer, Hidden Layer and Output Layer can represent the Artificial Neural Network. Figure 2.6 (see page 49) is a diagrammatic presentation of the structure of a typical neural network. The input layer receives the input from the external environment and output layer presents the result to the user. The hidden layer undertakes the self-learning process like human brain to investigate the inter-relationship of the inputs and produce the necessary outputs.

SPSS11 is a very popular software adopted for multiple regression analysis. It was used to generate the regression equations to explain how the critical site coordination problems affect the performance of subcontractors and the contributions of the essential causes to the problems. NeuroShell2 is a software programme that mimics the human brain's ability to classify patterns or to make predictions based on past experience. It can solve problems that cannot be solved by conventional computer software written in a step-by-step mode and guide user to build sophisticated custom problem solving applications without programme. The correlation coefficients computed by multiple regression analysis and neural networks analysis were compared to validate the reliability of the multiple regression equations generated.

Stage Six: Contribution of the causes to site coordination problems

The aim of this stage is to investigate the contributions of the essential causes to the site coordination problems. Data were collected through questionnaire survey (see Appendix A). Adopting the same approach of Stage Five study, SPSS11 was used to generate regression equations to relate the causes to each of the critical site coordination problems. NeuroShell2 was used to cross check the reliability of the regression equations.

Stage Seven: Improving the site coordination

Among the critical site coordination problems, some of them bear more impact than the others on the performance of subcontractors. Similarly, some of the essential causes bear more contributions to the occurrence of the critical site coordination problems. Backward elimination multiple regression method was used to identify the 'most essential' causes and the 'most critical' site coordination problems from the twelve essential causes and six critical site coordination problems. A series of figures were constructed in Chapter Eleven that link the 'most essential' causes to the 'most critical' site coordination problems and then to the project outcomes. The figures enable the main contractors to develop framework to improve the site coordination.

2.7 Summary

A seven-stage research methodology was formulated to achieve the research objectives. The first four stages were conducted to shortlist the critical variables for detail study. A full scale data collection exercise was carried out in Stage Five and Stage Six for building up the subcontractors' performance model and site coordination improvement framework. Data collection exercises were conducted through questionnaire surveys. Two different data analysis approaches, multiple regression technique and neural network technique, were adopted for cross reference purpose.

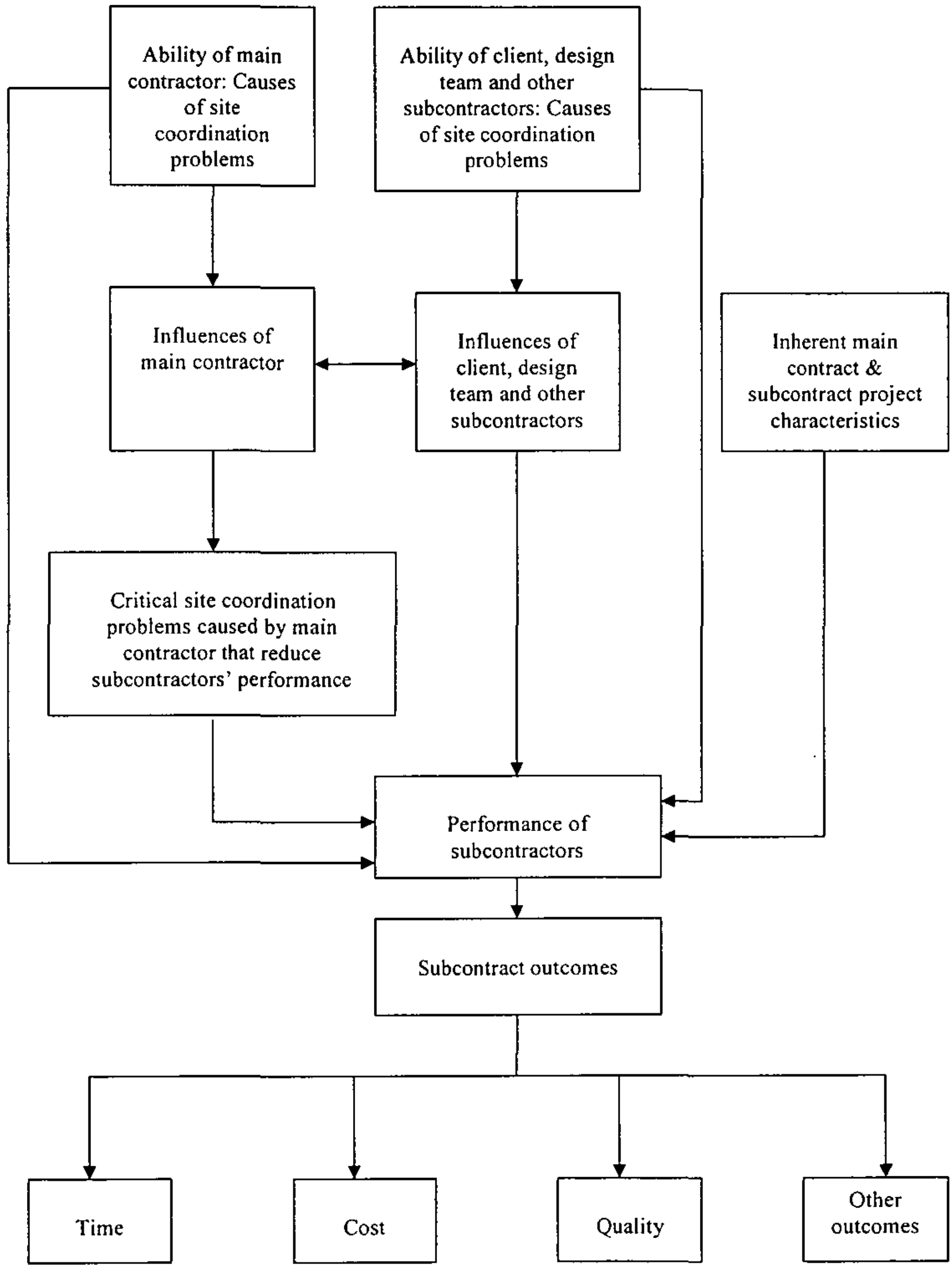

Figure 2.1: Theoretical framework

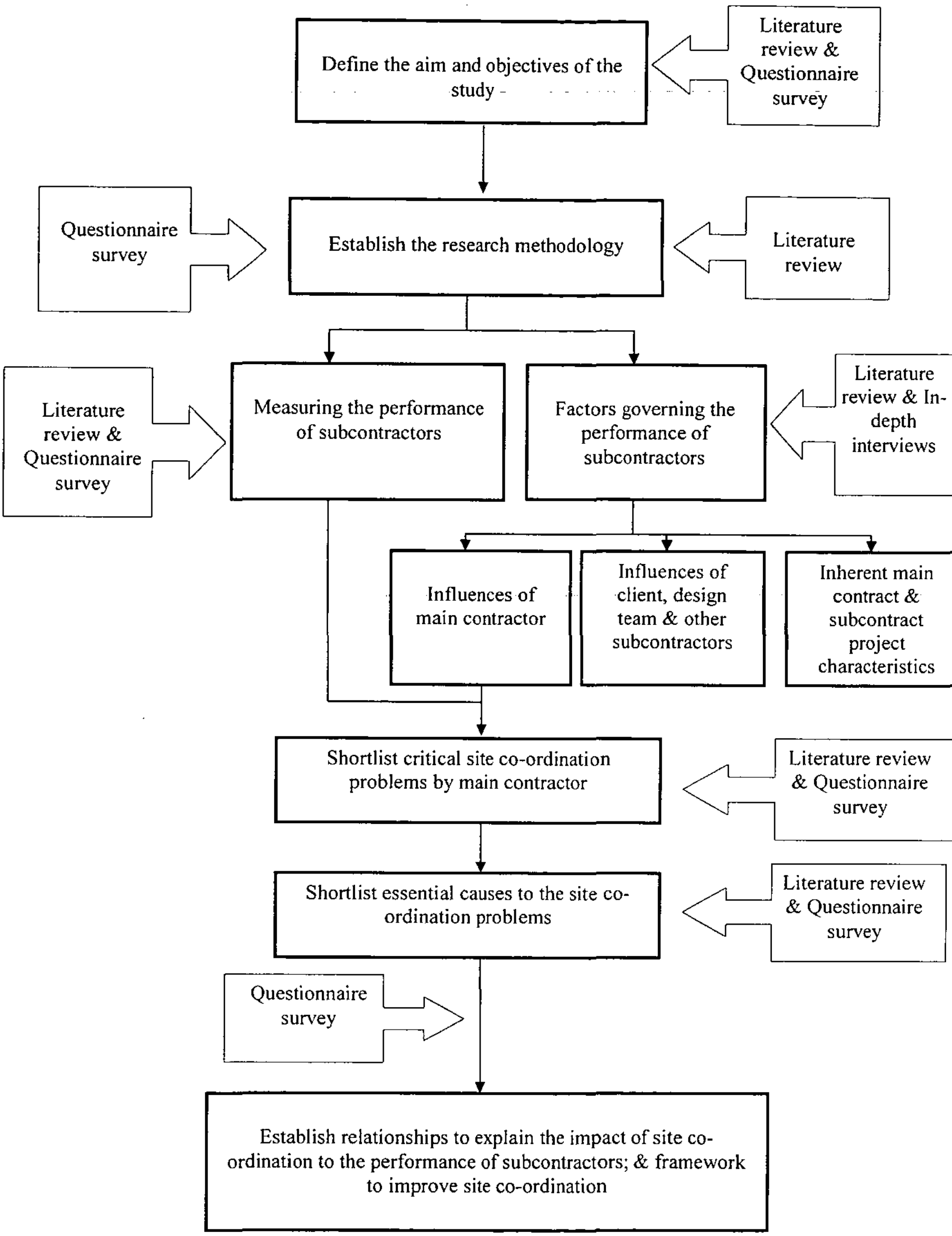

Figure 2.3: Research work flow chart

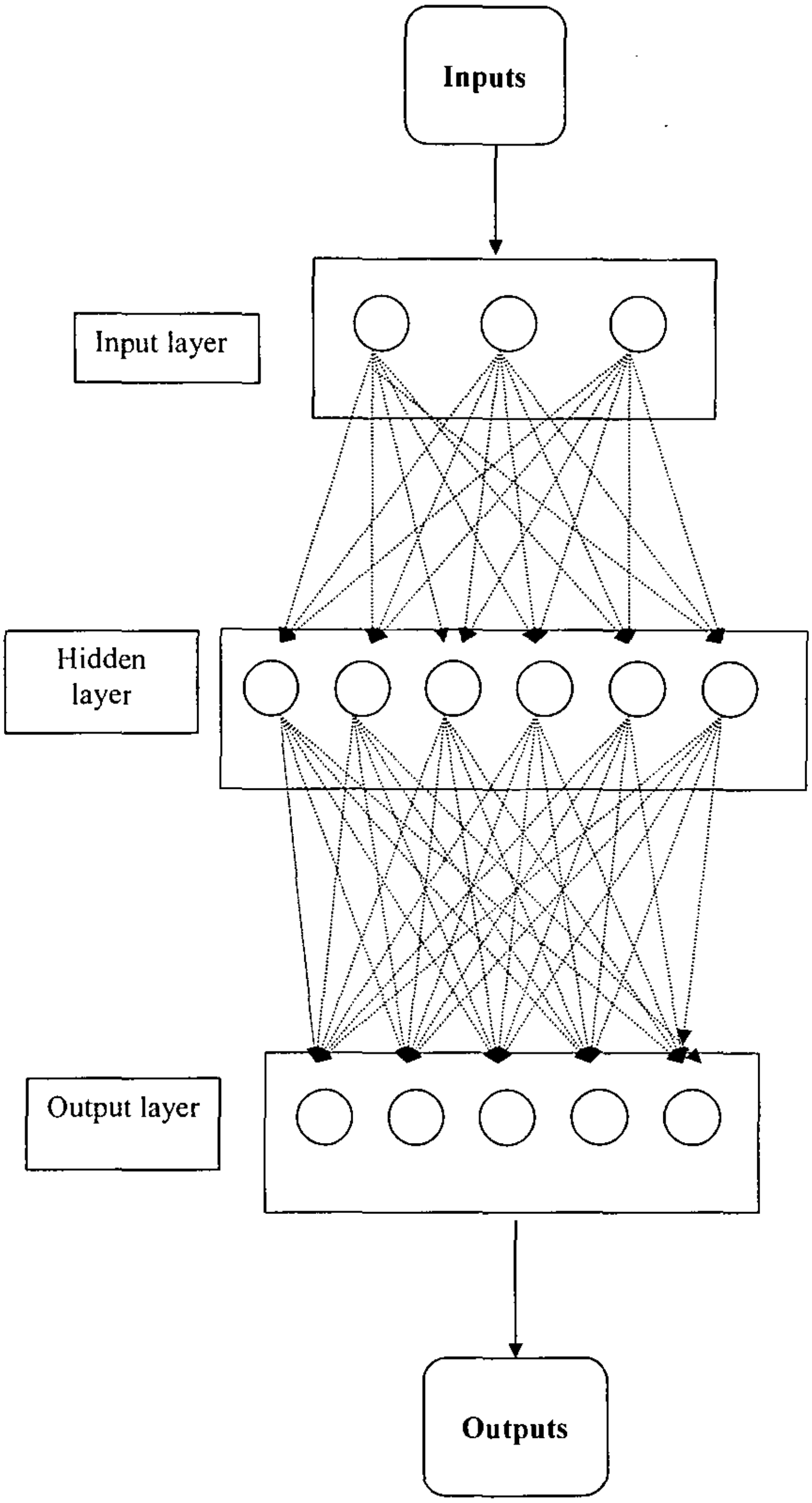

Figure 2.6: Structure of a typical neural network

CHAPTER THREE

LITERATURE REVIEW

3.1 Strategy of literature review

A literature review was undertaken to study the various issues related to the research topic. The aim was to explore the nature of multilayered subcontracting, summarize the essential approaches to identify the factors governing the performance of contractors for building projects and the applications of appropriate analytical approaches for this type of research. There are only a few publications that analyse the performance of subcontractors in building projects, consequently, the literature review mainly covered similar studies at the main contract level in order to extract the relevant information which could be modified to suite the nature of this research. The literature review included the following areas:

a. characteristics of multilayered subcontracting;

b. project objectives for building projects;

c. factors governing the performance of contractors for building projects; and

d. applications of multiple regression and neural network.

3.2 Multilayered subcontracting

This section explains the functions of subcontracting, describes the structure of multilayered subcontracting and discusses the associated problems and roles of different types of subcontractors.

3.2.1 Functions of subcontracting

Subcontracting is a common feature and long-established practice in the Hong Kong building industry (Walker and Flanagan, 1991). The use of subcontractors is a direct result of the complex and one-off temporary nature of contraction projects (Chan, Mok and Scott, 2001) and a subcontractor can be considered as an intermediary for the provision of various construction related services between the labour market and the main contractor (Hsieh, 1998) and provides one or more of the following four types of services:

a. design input;

b. bulk material supply;

c. components prefabrication/preassembly; and

d. site erection work.

Subcontracting is a strategy to deal with long-term environmental uncertainties and buffer the technical core of main contractors against short-term contingencies (Sozen, 1999). Construction firms can thus maintain a lean core size capable of undertaking the whole construction process (Sears, 1994) whilst shifting certain risks such market fluctuation on to their subcontractors (Reilly, 2001). There have many publications discussing the functions of subcontracting and Dombeger (1998-decromatic) concluded that the benefits could be categorised as follows.

a. Specialisation: Different parties can concentrate on activities in which they are relatively more well-trained.

b. Competition: Competition between subcontractors encourages innovative work practices.

c. Cost savings: International studies show that significant cost savings are achieved by subcontracting, on average in the order of 20%.

d. Flexibility: This is refers to the speed and cost of, adjustment to, changes in demand or supply conditions.

3.2.2 Structure of multilayered subcontracting

In multilayered subcontracting, main contractors divide the work into smaller packages by trade or area. In absence of any industry-wide registration or licensing scheme, sub-subcontractors can further divide their work into smaller packages and sub-let them to another layer thus creating sub-sub-subcontractors. The sub-letting process may continue for several times before reaching the party actually carrying the production work. The intermediate layers of subcontractors are merely brokers and increase the tiers of subcontracting without adding real value to the project and have been referred to as non-productive subcontractors (Cheng and Law, 2005).

3.2.3 Types of subcontractors

According to different selection processes, first layer subcontractors can be classified as either: nominated subcontractors; or domestic subcontractors. Nominated subcontractors are usually designated to the main contractor by the Client to perform a specialty work. Although nominated subcontractors are selected by the Client, there is no formal contractual relationship between them. The main contractor and each nominated subcontractor will enter into a formal contract. Domestic subcontractors are the main contractor's choice and be further classified into two types: fee subcontractors and labour-only subcontractors. The main difference between them is that fee subcontractor provides both labour and materials whilst the labour-only subcontractors only provide labour.

3.2.4 Problems of multilayered subcontracting

Multilayered subcontracting is an integral part of the production work of the local building projects. Any defects in this system would directly affect the whole construction process throughout the sector. Some publications have discussed the problems of excessive multilayered subcontracting as summarised below.

a. Latent subcontracting

Usually, the lower tiers subcontracting practices of the multilayered subcontracting are based on verbal agreement which makes them invisible to main contractors. Such practices have been referred to as latent subcontracting (Cheng and Law, 2005) which can result in the following problems

i. Supervision and management become very difficult and costly to exercise a full site supervision system with detail record of all site activities.

ii. Communication between the main contractor and the parties performing the work becomes indirect. Construction information thus needs to pass through several layers before reaching the workers and site problems cannot be reflected effectively (Sozen and Kuck 1999).

iii. Legal responsibility in latent subcontracting is unclear. Any fractures at the subcontracting chain would make it difficult to identify who should be held liable whenever there are legal disputes and quality problems (Kale and Arditi, 2001).

b. Non-productive subcontracting

Excessive subcontracting could be non-productive (Ngai 2001). The intermediate layers subcontractors are merely brokers. They get the job and re-contract to another subcontractor at a lower price to earn profit. The more the project brokers that exist, the high the number of subcontracting sub layers. This practice has existed in the local building industry for years because there is no: mandatory industry-wide subcontractor registration system; or strong and active trade unions to oversee the subcontracting. As a result, subcontractors who actually perform the construction works may be induced to save cost at the expense of quality (CIRC, 2001).

c. High mobility of workers

It is never easy to safely control site workers who are employed on daily basis by the sub-subcontractors or self-employed. The sub-subcontractors at the bottom of the multilayered subcontracting are often small firms. They are either self-employed or employ workers at a temporarily manner at a daily paid method because of uneven manpower requirements for different trades during the construction process and workers' own preferences (CIRC, 2001). Workers are called to work on site when they are needed, and are dismissed when they finish the work. Some workers may only involve in a job for a few days. It is difficult to assume the continuity of the quality of workmanship with high mobility of workers.

d. Low worker's morale

The flexible employment relation described above (Kalleberg, 2000; Polivka and Nardone, 1998) implies that workers are particularly susceptible to unemployment, underemployment and social exclusion (SEPI, 2003; Wong and Lee, 2001) especially during the economic recession in last few years. Quality of work can only be maintained at the minimum acceptable standard if workers are at very low morale.

3.3 Project objectives for building projects

In order to identify project related success factors, it is necessary to define the criteria that are used to measure the outcomes of the project. The section below section describes the evolution of performance assessment for building projects.

3.3.1 Traditional project objectives

From the client's point of view, time, cost and quality are the three most common fundamental project objectives for a building project (Stuckenbruck, 1981; Bennett, 1983; Walker, 1990). Timely completion of a project is frequently regarded as a major criterion of measuring project success. The NEDO report for Faster Building Industry (1983) concluded that project success was a function of management effort necessary to complete in time. Besides project delays, cost overruns are frequently identified as one of the principal factors leading to the high cost of construction (Charles and Andrew, 1990).

The vast majority of construction projects are procured on a cost and time basis (Bennett and Grice, 1990; Rwelamia and Hall, 1995).

In a typical building contract, the developer stipulates his requirements in terms of completion time, project price and the required standard of workmanship. Contractors must thus attain the cost level as planned, meet the scheduled deadlines and achieve the specified quality level. However, these three project objectives often run in three different directions (Kharbanda *et al.*, 1987). Figure 3.2 below shows the interrelationship of these three project objectives. 'Cost' directly burns up the profit of a contractor, 'time' can be converted into costs by liquidated damages and time dependent preliminaries, while 'quality' alone does not, in the short term, represent cost to a contractor if poor quality work slips through inspections unnoticed (Tam, Deng, Deng, Zeng and Ho, 2000). It is quite normal for the senior management to expect all of a project's objectives to be met, however, project objectives are not interdependent and, as pointed out by Ward, Curtis and Chapman (1991), trade-offs may have to be made between each objective. The role of construction project manager is to maintain a good balance of these three goals.

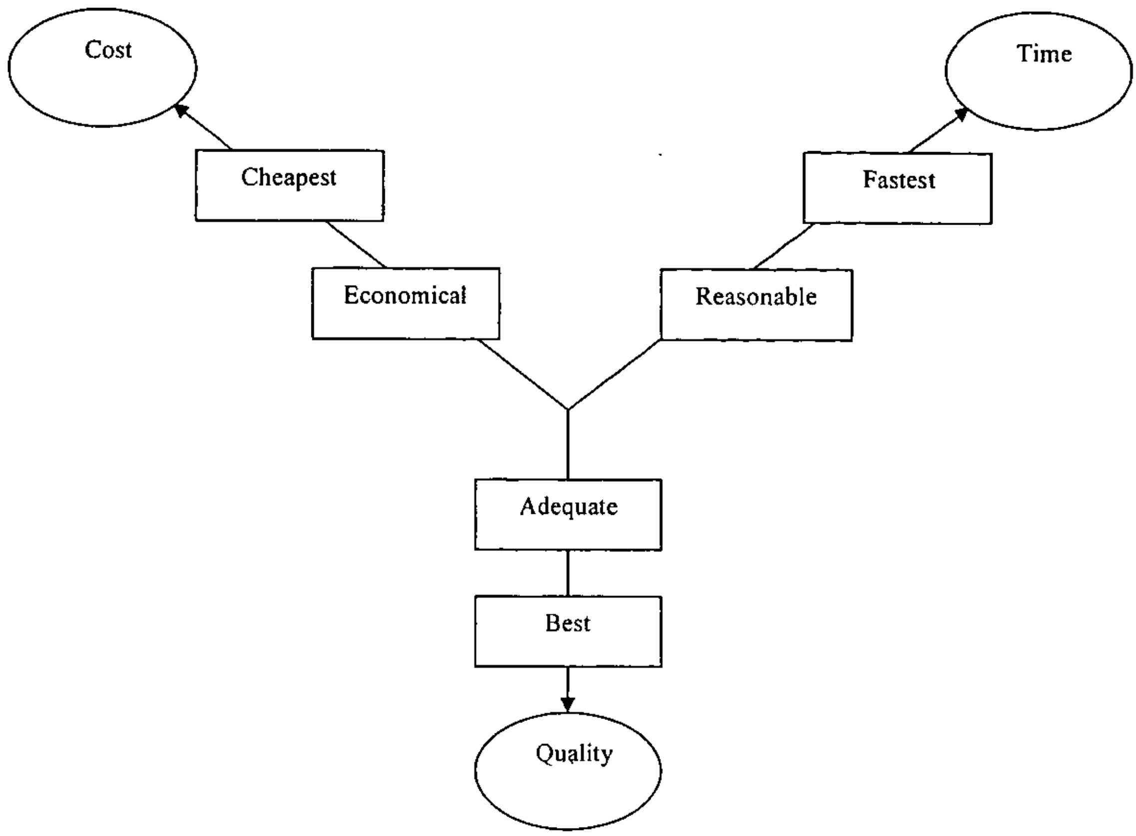

Figure 3.1: The eternal triangle between cost, time and quality (Kharbabda et al, 1987)

3.3.2 Contemporary approach

In the last decades, due to the rapid development in terms of the complexity and size of construction projects, and the increasing public concern on major developments, broader project objectives are being set for different projects according to their individual requirements. Safety and environmental concerns are the two most important performance factors to emerge in recent years.

Ofori (1992) suggested that the consideration of environmental issues should be part of the culture of the construction industry and be treated as the fourth dimension to construction project performance. The study of construction's impact in the environment has become a heated topic in the last decade (Morledge and Jackson 2001). The concept of 'Sustainable Development' is being widely implemented on construction projects. It emphasizes the balance and integration of the three sustainability pillars of economic development, social harmony and environmental protection. The International Council for Local Environmental Initiatives (1996) defined Sustainable Development as development that delivers basic environmental, social and economic services to all residences of a community without threatening the viability of natural, built and social systems depends. Sustainable Construction is a regarded as a way for the building industry to contribute to Sustainable Development (Bourdeau, 1999). The Sustainable Construction concept introduced by Kibert (1994) can be defined as the creation and responsible maintenance of a healthy built environment based on resources efficient and ecological principles.

Most contractors' financial losses associated with accidents, but not all, are also social costs (Tang *et al*, 2004), some of which are not incurred by contractors, but by society. There have been many studies (Everett and Frank Jr.,1996; Tang *et al*, 1997; Hinze, 2000) on the financial costs borne by contractors due to construction accidents and Tang *et al* (1997) summarized the financial costs into the following nine categories.

a. loss due to the injured person's absence from work;

b. loss due to the person's inefficiency after resuming work;

c. medical expenses;

d. fines and legal expenses;

e. loss of time of other employees;

f. equipment or plant loss;

g. loss due to damaged material or finished work;

h. loss due to idle machinery or equipment; and

i. loss.

The success of a building project demands the full supports from client, design team, main contractor and subcontractors. Ashley *et al* (1987) identified six criteria most frequently used to measure the success of a project: schedule performance; budget performance; client satisfaction; contractor satisfaction; functionality; and project management/team satisfaction.

Liu and Walker (1998) establish a model to measure the success of a project which comprised two levels of outcome which were developed from the fundamental behaviour-to-performance-to-outcome cycle in psychology. The first level of project objectives is generally defined by client. The second level of objectives includes those which are typical of all permanent organizations involved in the project, namely, their survival in the market place. It is postulated that the valence of the first-level outcome (project success) is dependent on the instrumentality relating to the second-level outcome (participant satisfaction). Sanvdo et al (1992) concluded that the success for a given project as the degree to which project goals and expectations are met.

Project success can be measured by means of satisfaction of the participant. However, construction projects involve numerous stakeholders, whose needs could directly influence the performance of subsequent projects (Leung, Ng and Cheung, 2004). It is difficult to represent participant satisfaction merely based in the project goals in terms of time/cost. Also, during the project development process, a dynamic temporarily multi-organisation system is often created that is continuously confronted with disparities between two levels of objectives: the temporary objectives of the construction project; and long-term objectives of the participating organisations and operational phase of the project (Mohsini and Davidson, 1992). Quality could be defined as 'value for money' from the client's point of view and the goal is client satisfaction (Rwelamia and Hall, 1995).

3.3.3 Hong Kong building projects

Among the three traditional building project objectives, time and cost are often more important than quality in the Hong Kong, which has developed a reputation for completing high-rise building projects in incredibly short periods of time. It arouses public interest as to the remarkable speed of construction and some even claim it can only be achieved in Hong Kong (Chan and Kumaraswamy, 1995). This is because the contract time set by the clients is usually unreasonably short due to the high cost of land. Under the keen competition environment, contractors have to accept such contract conditions and then to investigate measures to speed up the work as the project proceeds. Thus most of the production personnel of Hong Kong projects focus only on solving immediately site problems because their top priorities are to meet the production schedule. They consider that 'quality versus time versus cost' is a zero sum game, hence, whenever, there is a choice among the three, usually quality is the first to be sacrificed (Tam, Deng, Zeng and Ho, 2000). As a result, the construction industry in Hong Kong has long been associated with poor quality of workmanship such as water leakages at the window frame and roof structure (Tam and Tong, 1996; Kam and Tang 1998).

The Hong Kong construction industry has had a poor site safety record for over a decade. Reasons for this poor performance such as extreme high level of subcontracting and high proportion of unskilled immigrants from China entering the industry and unreasonable short construction time etc. have been documented elsewhere (Lingard and Rowlinson, 1991, 1994). In July 1995, the Hong Kong government started to implement a new safety strategy, which emphasised a self-regulatory approach to safety management strategies. This had pushed the property developers to set this item as one of the contract objectives for their projects through requesting the construction companies to submit the safety management systems with their tenders in bidding the job. The results of study by Tam and Fung (1998) shown that the number of site accidents has been drastically reduced with the launching of site safety management system.

Environmental management has become a critical issue of the Hong Kong construction industry in recent decades (Tam, 2001) and the Hong Kong Government is taking the leading role in the promotion of sustainable construction. In 1995, the eco-business awards scheme was launched to grant awards to organizations demonstrating a strong commitment to environment protection (EPD, 2001). The use of precast construction would be feasible on many occasions in Hong Kong and therefore recommended that prefabrication should be promoted in the private sector as an alternative means of environmentally friendly construction method (BDER, 2001). In February 2002, the Joint Practice Note No.2 issued jointly by the Building Department, Lands Department and Planning Department of HKSAR Government permitted the green features including prefabricated external walls to be exempted from the Gross Floor Area and/or Site Coverage calculations under the Building Ordinance. As a result of the above schemes, sustainable construction is considered as another essential goal for the local building projects.

The success and failure of construction project management reflects not only the teamwork of the project's management; it also reflects the management level of the construction enterprise. A "5+3" construction management model is formulated by Cheng (2005) that recommends to develop strategic partnering relationships to enhance cooperation among partners including subcontractors, reduce management cost, and builds up multi-directional trust for achieving a common goal.

3.4 Performance evaluation

Client satisfaction is an important tool to gauge the success of a project (Yasamis, Arditi and Mohammadi, 2002). The model developed for the measurement of client satisfaction includes the evaluation of achievement in product dimensions, services dimensions and culture dimension. The product dimension assesses the eight attributes of a product in order to evaluate the quality performance of contractors.

A study by Pongpeng and Liston (2003) attempted to identify a common set of contractor ability criteria to evaluate the overall performance of contractors. Nine groups of factors were categorized by applying factors analysis, namely 'engineering/construction', 'procurement/contract', 'project mangers', 'human resources', 'quality management systems', health and safety', 'plant/equipment', 'financial strength' and 'public relations'.

The simplest way to evaluate contractors' quality performance is to compare the workmanship with contract specification. The results of a survey (Kam, Kumaraswamy & Ng, 2004) on the use of construction specifications in Singapore shows that majority of respondents agreed that specifications were not being used in their full potential, especially at the site level. Specifications were generally perceived to be lacking coordination and containing ambiguities, irrelevant clauses and inappropriate standard.

Tam and Fung (1998) developed a model to evaluate the effectiveness of safety management strategies on safety performance in Hong Kong. The survey findings show that seven variables can explain about 40% of the safety performance of contractors: post-accident investigation; level of labour-only subcontracting; safety awards; safety training; safety committees; management involvement and safety orientation. Regular internal site safety inspection is an essential component of a safety management system. Laitien and Ruohomaki (1996) formulated a checklist for the weekly inspection based on participation and the principles of performance management and it had been tested at two construction sites. The results show that there was a significant improvement in safety performance of these two sites. The checklist includes working habits, scaffolding and ladders, machines and equipment, protection against falling, lighting and electricity, order and tidiness.

Environmental performance assessment (EPA) has been designed for reviewing, monitoring, checking and evaluating environmental performance. Tam et al (2006) has identified evaluation factors and grouped them into seven major factors: management and training; air and noise; auditing; waste and water; cost saving on resources; energy; and regulation.

Poon *et al* (2004) conducted a survey on the causes and quantities of construction waste of five public housing projects through regular site visits and interviews to site management. Recommendations to reduce construction waste include the preparation of a detailed waste management plan at planning stage, good housing keeping and on-site sorting of inert from non-inert materials at construction stage.

3.5 Factor governing the performance of contractors

There has been considerable research aimed at identifying the determinants for the performance of the contractors in building project, however, most were focussed at the main contract level only. The literature reviews show that early studies on this issue mainly cover the success factors the project as a whole. The latest publications are more specific that investigate the determinants for particular project outcomes or location. The literature in this area has been divided into the following four headings:

a. 'Overall' success factors;

b. Determinants for particular project outcomes at different locations;

c. Determinants for outcomes of Hong Kong projects; and

d. Factor influencing site work.

3.5.1 'Overall' success factors

There are many factors that can affect project outcome with certain factors having more impact than the others. Rockart (1982) used 'critical success factors' to describe these factors and are defined as those factors predicting success on projects.

Through interviews with construction project personnel and literature reviews, Ashley *et al* (1987) defined six criteria to measure the success of a project and concluded that planning effort, project team motivation, project manager goal commitment, project manager technical capacities, control systems, and scope and work definition are the critical success factors.

A case study research by Morris and Hough (1987) on eight large complex projects around the world consolidated forty-seven success factors, where were classified into six headings: project objectives, technical uncertainty innovation; politics; community involvement; schedule duration urgency; financial; and contract, legal and implementation problems.

Jaselkis and Ashley (1988) studied the information from seventy-eight projects and identified twenty-seven success factors and grouped them into four headings: project manager's capabilities; experience and authority; the stability of project team; project planning and control effort. Through analysing the data by logistic regression, 'reducing team turnover' and 'program constructability' were found as the two key factors required for achieving 'overall' project success on construction works.

Mohini and Davidson (1992) adopted inter-organizational conflict among the project's task-organizations as a yardstick to analyse the significant determinants of performance for construction projects. The determinants were categorised into three main groups: domain consensus; availability and access to information; and interdependence of tasks.

Some studies had tried to forecast the success of a project based on factors already known at the pre-contract stage. Kometa *et al* (1995) studied the pre-contract client evaluation process and established who conducted an internal audit of their organisations before embarking on the briefing process, would generally have a higher level of success. Hatush and Skitmore (1997) analysed the perceived relationship between twenty contractor selection criteria currently in use and project success factors in terms of time, cost and quality involving a sample of eight experienced construction personnel. The results of the research indicated that past failures, financial status, financial stability, credit ratings, experience, ability and management personnel, and management knowledge are perceived to be the most dominant critical success factors affecting all three project success factors. Bedelian (1996) conducted a research to predict the success for UK construction projects and identified six critical success factors: clarity of tender documents; good client/contractor relationships; clear design brief with minimum subsequent changes; time given to develop the design; early and detailed design and planning; and value engineering.

Early stage studies summarized above focussed on analysing the generic critical success factors for construction projects, which has laid down a good foundation to provide knowledge for the detail studies on the success factors for particular project outcomes and locations.

3.5.2 Determinants for particular project outcomes at different locations

In order to have better control on the projects, some studies were designed to identify the critical success factors for particular project outcomes. The results of a study by Jaselkis and Ashley (1991) demonstrated that key success factors affect project outcomes differently. For example, increasing the number of budget updates has more of an impact on achieving better budget performance than it does on achieving better schedule and overall project performance. Implementation of a constructability programme seems to have a significant impact on achieving overall project success and better schedule performance – especially on fixed-price contracts. The findings had found a good base for a series of follow-up studies. Chua et al (1997) investigated the key determinants for budget performance based on the data obtained in a questionnaire survey conducted by Jaselkis and Ashley (1988). Eight key factors were identified covering areas of the project manager, his team, planning and control efforts, namely: number of organisation levels between project manager and craftsmen; project manager experience on similar technical scope; detailed design complete at start of construction; constructability programme; project team turnover rate; frequency of control meetings during construction; frequency of budget updates; and control system budget. Kog *et al* (1999) conducted a study based on the records in Jaselskis and Ashley (1991) and identified five key determinants for construction schedule performance: time devoted by the project manager to a specific project; frequency of meetings between the project manager and other personnel; monetary incentives provided to the designer; implementation of constructability; and project manager experience on projects with a similar scope.

Some publications focus on the factors for a particular location, for example, Kaming *et al.* (1997) studied factors influencing construction time and cost overruns in Indonesia. Inflationary increases in material cost, inaccurate material estimating and project complexity were found to be the main causes of cost overruns on high-rise building projects. The predominant causes of delay were design changes, poor labour productivity and inadequate planning. Walker (1995) developed a model to describe the factors affecting construction time performance of the construction projects in Australia, which classified the factors into four headings: construction management effectiveness; sophistication of the client and the client's representative in terms of creating and maintaining positive project team relationships with the construction management and design team; design team effectiveness in communicating with construction management and client's representative teams; and project scope and complexity. The research demonstrated that the construction management team's performance plays a pivotal role in determining construction time performance. There is also an important relationship between sound client's representative management effectiveness and good construction time performance. Walker and Shen (2002) conducted another study on construction time performance in Australian projects using case study method. The results conclude that both ability, supported by organizational and team competence; and commitment to explore construction method options in a flexible manner, i.e. responding to unanticipated problems, are necessary to facilitate good construction time performance. A questionnaire survey by Nkado (1995) had consolidated 33 specific factors that influence the construction time in the UK projects from literature reviews. The factors were classified into six headings: Client; Design and specialist consultants; Contract; Project; Site management; and External influences. Respondents were requested to indicate whether or not they consider the individual factors in estimating construction time. An examination of the resulting consensual ordering of the factors shows that those high on the priority list are generally readily identifiable from project information and directly quantifiable by the contractor. Furthermore, their impact on construction time can be assessed explicitly.

Some studies were aimed to help the clients and their consultants in estimating or benchmarking the construction duration at the earliest stages of future projects. Bhokha and Ogunlana (1999) forecasted the construction duration of buildings at the predesign stage for Thailand projects based on eight variables: building function; structural system; functional area; height index; complexity of foundation works; exterior finishing, decorating quality; and site accessibility. Burrows *et al.* (2004) analysed the 'actual time' to construct buildings in the UK. The study investigated six variables of the 1,500 completed building projects: project sector, client type, procurement route, building function, contractor selection method, and region. Similar approach was adopted by

Skitmore and Ng (2003) to forecast both the construction time and cost for the projects in Australia, which were based on six variables: Client sector; Contractor selection method; Contractual arrangements; Project type; Contract period and Contract sum.

3.5.3 Determinants for outcomes of Hong Kong projects

Some studies have been conducted to identify the success factors for Hong Kong projects. Tam and Harris (1996) developed a model to predict the performance of the main contractors in local construction projects from the client's perspective. The resulting models produced six significant variables: Quality of the management-professional qualifications; Quality of management team-project leader's experience; Complexity of the project; Contractor's past performance or image; Architect's or client's supervision; and Control of the quality of work and work progress. These variables were used to measure the three dimensions of a project: Inherent characteristic of the project; Contractor's internal attributes; and External influence of the project team.

Kumaraswamy and Chan (1995) established a hierarchy to illustrate the factors that can contribute to construction project duration in Hong Kong. Construction time can be considered to be a function of all such primary, secondary and tertiary factors in the hierarchy of determinants of construction project duration.

Chan and Kumaraswamy (1998) conducted a similar study focused on the causes of construction delays in Hong Kong. The study classified the essential factors governing construction durations into eight categories: Project-related factors; Client-related factors;

Design team-related; Contractor-related factors; Material-related factors; Labour-related factors; Plant/equipment-related factors; and External factors.

Dissanayaka and Kumaraswamy (1999; 1999) evaluated the factors affecting the time and cost performance on Hong Kong building projects and grouped them into macro variables, each of which then 'covered' a large number of micro variables. All the selected micro variables may not be of the same importance in every project but may vary with the client's objectives, priorities, project conditions, constraints and complexities and the quality of the project team. The variables were also grouped into procurement and non-procurement variables.

Leung, Ng and Cheung (2004) adopted a new approach to review the success factors of projects in Hong Kong. The results of the study indicate that the satisfaction of the participants of a building project is more important to project success than meeting any particular project objectives and management mechanisms rather than particular project goal could directly affect the participant satisfaction. Cooperation/participation, task/team conflict and goal commitment are the critical factors influencing the final outcome (satisfaction) in the complicated management process.

3.6 Factors influencing site work

Some publications further streamlined their researches to the factors affecting productivity at the site work level. Herbsman and Ellis (1990) developed a statistical model that illustrated the quantitative relationships between influence factors and the productivity. The critical productivity influence factors can be divided into two groups: Technological factors and Administrative factors. Technological factors include design data, material properties, and location factors. Administrative factors include construction method and procedures, equipment factors, labour, and social factors. Lim and Price (1995) cited the seven factors identified as affecting overall construction productivity in Singapore: Buildability; Structure of the industry; Training; Mechanization and automations; Foreign labour; Standardizations; and Building controls. Zakeri *et al* (1996) analysed the constraints to site work on Iranian construction projects. The common problems identified were rank through questionnaire survey method. Results indicate that the five highest-ranking problems are: Material shortage; Weather and site conditions; Equipment breakdown; Drawing deficiencies/changes orders; Lack of proper tools and equipment. Kadir et al (2005) studied the production factors critically influencing the site work for Malaysian residential projects. The results indicate that the top most important, frequent and severe factors that are adversely construction labour productivity at a projects level were material shortage at site and non-payment to suppliers causing the stoppage of material delivery. Cottrell (2006) established a regression model to relate the factors affecting site productivity to the process improvement initiatives executed both before and during construction stage. The model demonstrates the strong relationship of project performance to a variety of process improvement initiatives including design completeness, the definition of a project vision statement, testing oversight, and project manager experience and dedication.

As efforts have been rarely been made to obtain craft worker' input to examine the factors affecting the construction productivity, Dai *et al* (2007) measured the impact of 83 factors productivity factors, which had been identified through 18 focus group sessions with craft workers and their immediate supervisors on jobsites. The factors were categorized into eleven groups: Supervisor direction; Communication; Safety; tools and consumables; Materials; Engineering drawing management; Labour; Foreman; Superintendent; Project management; and Construction equipment. Makulsawatudom and Emsley (2001) conducted a questionnaire survey to collect views from craftsmen working on five construction projects on the factors affecting construction productivity. Eight factors that have the most effect on construction productivity are concluded: Lack of material; Lack of tools and equipment; Incomplete drawings; Overcrowding; Poor site conditions; Tools/equipment breakdown; Incomplete supervisor; and Rework.

There are studies focused on reviewing the degree of impact of the important factors to the productivity. Moselhi, Assem and Ei-Rayes (2005) investigated the impact of change orders on construction productivity and introduced a new neural network model for quantifying the impact. The change orders factors that affect labour productivity include intensity of the orders, timing in relation to projection, work type, type of impact, project phase, and on-site management. The impact of subcontracting on site productivity was evaluated through a questionnaire survey on general contractors in Taiwan (Hsieh, 1998). The survey findings demonstrate that contractual and behavioral linkages between firms call not only for the realization of an attractive gain from productivity improvement but also for an agreeable benefit-sharing mechanism between firms. Financial incentives are very effective to improve site productivity. A questionnaire survey was conducted by Fagbenle, Adeyemi and Adesanya (2004) to determine the impact of non-financial incentives on bricklayers' productivity in Nigeria. Fifteen common non-financial incentive schemes were selected for the survey. The analysis of the survey concluded that non-financial incentive schemes could motivate bricklayers and increase the productivity in bricklaying work for 6 to 26%.

3.7 Applications of Multiple Regression Analysis and Neural Networks Analysis

The literature review undertaken shows that multiple regression analysis and neural network analysis are two common methods adopted for the researches involving forecasting models. Regression techniques often have been used because of their relative simplicity in both concept and application. It has the ability to develop causal models where the structural relationships of the variable can be established in a predictable and explanatory way. Neural network techniques are commonly adopted in the recent researches because it is designed to capture functional forms automatically, allowing the uncovering of hidden nonlinear relationships between the modelling variables.

Walker (1995) used multiple regression analysis to build up models to forecast the time performance for projects in Australia based on four variables. Tam and Harris (1996) adopted discriminant analysis to demonstrate that the performance of contractor measured in terms of time, cost and quality can be related to the characteristics concerning the project and the parties involved in Hong Kong Projects. Chan and Kumaraswamy (1999), and Leung and Tam (1999) applied this technique to establish models to predict the overall duration and the hoisting time for a tower crane respectively for public housing projects. Skitmore and Ng (2003) adopted the same statistical approach using forward cross validation procedure to forecast the construction time and cost for the projects in Australia based on six variables.

The models formulated by Bhokha and Ogunlana (1999),based on eleven independent variables and a three-layered back-propagation network to forecast the construction duration at the predesign stage of buildings in Greater Bangkok, and the model formulated by Khosrowshahi (1999), based on eleven variables and a stochastic back-propagation paradigm with one hidden layer to predict the performance of the contractor at tender stage are typical applications of neural network analysis. This technique was also widely adopted in other studies such as: forecasting the cost index (Wang and Mei, 1998) and equipment productivity (Ok and Sinha, 2006); selection of vertical formwork systems (Tam et al, 2005); and assessing the maintainability of building façade (Chew, Silva and Tan, 2004).

Dissanayaka and Kumaraswamy (1999; 1999) analysed data by using multiple regression method and neural network method separately to establish models to forecast the time and cost performance for the projects in Hong Kong. Results using multiple regression suggest that procurement sub-systems variables are less significant than the non-procurement related (or intervening) variables in predicting time and cost performance levels. Results using neural network demonstrate that time over-runs appear to be greatly influenced by non-procurement related factors while cost over-runs appears to be greatly influenced by both procurement and non-procurement related factors.

Some publications compared the accuracy of the multiple regression and neural network approaches. Goh (1999) assessed the accuracy of multiple regression approach in forecasting construction sector demands in Singapore. The results show that regression analysis may not be able to relate the complex nature of any macroeconomic relationships. Neural networks analysis recommended as it can form nonlinear mappings with hidden layers, however, the 'black-box' characteristic of neural networks is a major limitation, as its lacks explanatory capabilities. Vojinovic and Kecman (2001) test both approaches on common data sets for cost estimation for construction projects. The results showed that neural network models outperformed the multiple regression models in project cost estimating and forecasting. In static model simulations the performance of neural network models improved significantly improvements with the increase of the size of training data sets, while the improvements for multiple regression models were less significant. The study by Williams (2002) to predict the completed project cost using bidding data has different results. The best performing regression model produced superior predictions to the best performing neural network model. Hybrid models that used a regression model prediction as an input to a neural network were found to produce reasonable predictions. Therefore, it seems appropriate to agree with Makridakis et al. (1982) that no one technique is globally superior, but rather each method is appropriate for certain individual situations.

3.8 Summary

The nature of multilayered subcontracting of the local construction industry has been reviewed in this chapter. The problems of excessive multilayered subcontracting identified are grouped into four headings:

a. latent subcontracting;

b. non-productive subcontracting;

c. high mobility of workers; and

d. low worker morale.

By studying the publications related to the traditional building project objectives and the contemporary approach to assess the outcomes of building projects, the common objectives for the Hong Kong building projects were identified and used to measure the performance of subcontractors of this research. A set of measuring criteria for each of the project objective are selected based on the literature review on the methods of performance evaluation and they are summarized in Table 3.1.

Table 3.1: Summary of subcontractors' performance evaluation objectives and criteria

Objective and criteria	Corresponding criteria in the reference	Reference
Objective: Time		Chan & Kumaraswamy (1995); Tam *et al* (2000)
Progress of work follow schedule	Service dimension: timeliness Project monitoring	Yasamis *et al* (2002) Pongpeng & Liston (2002)
Propose method to speed up progress	Ability to adjust a project	Pongpeng & Liston (2002)
Objective: Safety and health		Lingard & Rowlinson (1991& 1994); Tam and Fung (1998)
Follow safety rules	Working habits Health and safety control	Laitinen & Ruohomaki (1996) Pongpeng & Liston (2002)
Propose method to eliminate potential danger to workers	Post accident investigation	Tam & Fung (1998)
Objective: Quality		Chan & Kumaraswamy (1995); Tam *et al*(2000)
Quality of work comply with specification	Compared with specification Product dimension: conformance	Tam & Harris (1997) Yasamis *et al* (2002)
Quality of work comply with trade standard	Product dimension: perceived quality Inappropriate quality	Yasamis *et al* (2002) Lam, Kumaraswamy & Ng (2004)
Objective: Cost		Chan & Kumaraswamy (1995); Tam *et al*(2000)
Amount of claims to main contractors	Claims	Frisby (1990)
Contributions on reducing construction cost	Ability to adjust a project	Pongpeng & Liston (2002)
Objective: Potential for long-term development		Cheng (2005)
Application of advance technology	Balance ability between conserving and challenging traditional operations or behaviours	Pongpeng & Liston (2002)
Relationship with participants	Culture dimension: Partnership development, Client focus Past client/contractor relationship	Yasamis *et al* (2002) Hatush & Skitmore, (1997)
Administrative issues such as submission of records, sample, shop drawings	Procurement plan	Pongpeng & Liston (2002)
Objective: Sustainability		Tam (2001); EPD (2001); BDER (2001)
Suggestions to improve the design in terms of buildability; durability and maintainability	Production dimension: durability	Yasamis *et al* (2002)
Amount of nuisance such as duct, noise, vibration etc generated	Air and noise	Tam *et al* (2006)
Amount of construction waste generated	Waste reduction measures Waste and water	Poon, Yu, Wong & Cheung (2004) Tam *et al* (2006)
Material wastage level	Waste reduction measures	Poon, Yu, Wong & Cheung (2004)
Objective: Public image		Pongpeng & Liston (2002)
Site tidiness	Product dimension: Aesthetics; Tidiness Housing keeping	Yasamis *et al* (2002) Laitinen & Ruohomaki (1996) Poon, Yu, Wong and Cheung (2004)
Worker's working uniform	Housing keeping	Laitinen & Ruohomaki (1996); Poon, Yu, Wong & Cheung (2004)

Publications for the factors governing the performance of main contractors in building project have been reviewed. Adopting the model developed by Tam and Harris (1996), the important factors influencing the performance of subcontractors in the HK building projects were selected for this research and classified into three main categories. The references to each of the factors are summarized in Table 3.2, Table 3.3 and Table 3.4 as:

a. inherent project characteristics;

b. ability of the key participants; and

c. influence of the participants to the subcontract.

The common site problems and the causes to these problems were examined by studying the publications for the factors affecting the productivity at the site work level. The problems are grouped into three categories according to the research theoretical framework shown in Figure 2.1 (page 47):

a. influences of main contractor;

b. influences of client, design team and other subcontractors; and

c. inherent main contract and subcontract project characteristics.

Table 3.2: Summary of the factors related to the inherent project characteristics

Factor	Corresponding factor in the reference	Reference
Complexity of the works	Constructability Project complexity Project scope and capacity	Chua *et al* (1997) Kaming *et al* (1997); Tam & Harris 1997 Walker (1995)
Use of new technology	Technical uncertainty innovation Explore construction method options in a flexible manner	Morris & Hough (1987) Walker & Shen (2002)

Table 3.2: Summary of the factors related to the inherent project characteristics (Cont'd)

Restrictions due to environmental factors	Location	Chan Kumaraswamy (1995)
Unrealistic contract duration	Unrealistic deadline for project completion Schedule duration urgency Constructability programme Unrealistic contract duration	Kadir *et al* (2005) Ashley *et al* (1987) Ashley 1991, Chua *et al* (1997) Kumaraswamy & Chan (1999)
Quality of the design document	Clear design brief Detailed design complete at start of project Quality of deign Mistake and discrepancies in design documents	Bedelian (1996) Chua *et al* (1997) Tam & Harris (1996) Kumaraswamy & Chan (1999)
Buildability of the design	Buildability Poor billability	Lim & Price (1995) Kadir *et al* (2005)
Relationships among the participants	Good contractor and contractor relationship Positive project team relationship	Bedelian (1996) Walker (1995)
Payment methods	Punctuality of payment	Tam & Harris (1997)
Incentive scheme	Motivation Project team motivation Monetary incentive	Lim & Price (1995) Ashley *et al* (1987) Kog *et al* (1999)
Perceived profitability	Profitability	Tam & Harris (1996)
Risk sharing between the main contractor and subcontractors	Risk allocation	Chan & Kumaraswamy (1995)
Involvement of the subcontractor in the design work	Early and detail design and planning	Bedelian (1996)
Clarification of the involvement	Scope and work definition Clarify of tender documents	Ashley *et al* (1897) Bedelian (1996)
Communication system	Access of information Effectiveness in communicating with construction management	Mohsini & Davidson (1992) Walker (1995)

Table 3.3: Summary of the factors related to the ability of key participants of the subcontracts

Factor	Corresponding factor in the reference	Reference
Technical ability	Technical ability Project manager technical capacities	Pongpeng & Liston (2002); Hatush & Skitmore (1997) Ashley *et al* (1987)
Financial ability	Financial soundness	Hatush & Skitmore (1997)
Managerial ability	Management capacity Project manager capacity	Ashley *et al* (1987) Jaselkis & Ashley (1988); Chua *et al* (1997)
Response to change	Project manager technical capacities	Ashley *et al* (1987)

Table 3.4: Summary of the factors related to the influences of the key participants to the subcontracts during construction stage

Factor	Corresponding factor in the reference	Reference
Plant support	Plan ownership programme	Tam &Harris (1996)
Material support	Material cost Material shortage	Kaming *et al* (1997) Kumaraswamy & Chan (1999)
Staff support	Labour factor Poor productivity	Herbsman & Ellis (1990) Kaming *et al* (1997)
Levels of coordination	Number of organization levels between project manager and craftsman Drawing and sample approval process	Chua *et al* (1997) Kumaraswamy & Chan (1999)
Payment	Late payment	Kadir *et al* (2005)
Construction communication	Change order by consultant	Kadir *et al* (2005)
Design changes	Minimum subsequent change Design change Number of drawing amendments	Bedelian (1996) Kaming *et al* (1997) Tam & Harris (1996)
Disputes settlement	Budget update Disputes and conflicts	Ashley (1991) Kumaraswamy & Chan (1999)
Claims	Cooperation	Leung, Ng & Cheung (2004)
Response by the participants	Community involvement Response to unanticipated problems Low speed of decision making involving all project teams	Morris & Hough (1987) Walker & Shen (2002) Kumaraswamy & Chan (1999)

Site coordination problem caused by main contractor is one of the influences of main contractor to the subcontracts at construction stage. Table 3.5 summarized the common site coordination problems selected for this research. According to their natures, they are grouped into eight main headings:

a. construction information;

b. working programme;

c. preparation for work place;

d. interfacing work to be completed by other subcontractors

e. access to work place;

f. plant support;

g. material support; and

h. response to site problems

Some publications have suggested possible causes to the occurrence of the site coordination problems. Table 3.6 summarizes the causes to each of the problems selected for this research and these causes are grouped into three categories according to their natures.

a. Staffing;

b. Technical; and

c. Management system.

Table 3.5: Summary of common site coordination problems

Factor and Problem	Corresponding problem in the reference	Reference
Factor: Construction information		
a. information not detail enough	Drawing Availability of information Incomplete drawing Design completeness	Zakeri (1996) Kumaraswamy & Chan (1998) Makulsawatudom & Emsley (2001) Cottrell (2006)
b. unclear or contradictory information	Drawing/spec/change order Redwork due construction error Design completeness	Zakeri (1996) Kadir *et al* (2005) Cottrell (2006)
Factor: Working programme		
a. working programme not detail enough	Construction method and procedure Lack of proper plan	Herbsman & Ellis (1990) Zakeri (1996)
d. working sequence not practical	Construction method and procedure Lack of proper plan	Herbsman & Ellis (1990) Zakeri (1996)
c. short notice for commencing site work	Delay in work permits	Dai *et al* (2007)
d. late change of working programme	Interface at work Late change of work	Zakeri (1996) Kadir *et al* (2005)
Factor: Preparation for work place		
a. work place environment not yet prepared such as general site cleaning, fresh air supply, lighting	Lack of working facilitates Poor site condition	Zakeri (1996) Kadir *et al* (2005); kulsawatudom & Emsley (2001)
b. inadequate or insufficient temporary work support such as scaffolding, water & power supply	Disruption of power/water supply	Kadir *et al* (2005)
Factors Interfacing work to be completed by other subcontractors		
a. work not yet completed	Performance of other subcontractors Lack of coordination between the trades	Kumaraswamy & Chan (1998) Dai *et al* (2007)
b. work not accurately completed	Performance of other subcontractors	Kumaraswamy & Chan (1998)

Table 3.5: Summary of common site coordination problems (Cont'd)

Factor: Access to work place		
a. access road not yet ready	On-site transport difficulties Inappropriate vehicle traffic routes	Zakeri (1996) Dai *et al* (2007)
b. access routing not convenient	On-site transport difficulties Inappropriate vehicle traffic routes	Zakeri (1996) Dai *et al* (2007)
Factor: Plant support		
a. late to provide plant support	Equipment factors Lack of proper tool and equipment Supply of plant Equipment shortage Tool availability Lack of tools/equipment	Herbsman & Ellis (1990) Zakeri (1996) Kumaraswamy & Chan (1998) Kadir *et al* (2005) Dai *et al* (2007) Makulsawatudom & Emsley (2001)
b. type of plant provided not appropriate	Equipment factors Equipment breakdown Equipment shortage Lack of tools/equipment	Herbsman & Ellis (1990) Zakeri (1996) Kadir *et al* (2005) Makulsawatudom & Emsley (2001)
Factor: Material support		
a. insufficient amount	Material properties Lack of material Supply of material Late to supply material Material shortage Lack of material	Herbsman & Ellis (1990) Zakeri (1996) Kumaraswamy & Chan (1998) Kadir *et al* (2005) Dai *et al* (2007) Makulsawatudom & Emsley (2001)
b. type of material provided not appropriate	Material properties Poor material quality	Herbsman & Ellis (1990) Dai *et al* (2007)
Factor: Response to site problems		
a. late response to site problems	Inspection delay Slow response Inspection delay	Zakeri (1996) Kadir *et al* (2005) Dai *et al* (2007)
b. solution recommended not practical	Inspection delay Problem-solving skill	Zakeri (1996) Pongpeng & Liston (2002)

Table 3.6: Summary of causes to site coordination problems

Category and cause	Corresponding cause in the reference	Reference
Category: Staffing	Labour factor	Herbsman & Ellis (1990)
a. staff too inexperienced to coordinate the technical administration work	Labour factor Training Quality of managers Incapability of site staff Project management experience Incompetent supervisor Project manager capacities	Herbsman & Ellis (1990) Lim and Price (1995) Kumaraswamy & Chan (1998) Kadir *et al* (2005) Pongpeng & Liston (2002) Makulsawatudom & Emsley 2001 Cottrell (2006)
b. frequent change of personnel	Changing crew size and turnover Foreman changes	Zakeri (1996) Dai *et al* (2007)
c. staff too inexperienced to coordinate the site work	Labour factor Training Quality of managers Incapability of site staff Project management experience Foreman incompetence Incompetent supervisor Project manager capacities	Herbsman & Ellis (1990) Lim & Price (1995) Kumaraswamy & Chan (1998) Kadir *et al* (2005) Pongpeng & Liston (2002) Dai *et al* (2007) Makulsawatudom & Emsley (2001) Cottrell (2006)
d. insufficient directly employed worker to carry out the temporary work	Changing crew size and turnover Amount of directly employed labour	Zakeri (1996) Tam & Harris (1996)
e. insufficient staff to coordinate the site work	Changing crew size and turnover Numbers of managers	Zakeri (1996) Kumaraswamy & Chan (1998)
f. insufficient staff to coordinate the technical administration work	Changing crew size and turnover Number of managers	Zakeri (1996) Kumaraswamy & Chan (1998)
Category: Technical	Technological group	Herbsman & Ellis (1990)
a. insufficient technical support from head office	Design data	Herbsman & Ellis (1990)
b. poor temporary work design	Lack of crafts productivity improvement suggestion	Dai *et al* (2007)
c. insufficient site office space	Site congestion	Kadir *et al* (2005)
d. poor site layout	Site congestion	Kadir *et al* (2005)
e. poor project programme or phasing of work	Inadequate planning Project phase	Makulsawatudom & Emsley (2001) Moselhi, Assem & Rayes (2005)
Category: Management system	Administrative group	Herbsman & Ellis (1990)
a. unclear communication path	Poor communication Reporting system	Zakeri (1996) Cottrell (2006)
b. insufficient authority for frontline staff	Lack of authority to discipline craft workers	Dai *et al* (2007)
c. too much paper work	Excessive paperwork Excessive paper work for request	Zakeri (1996) Makulsawatudom & Emsley (2001)

A model to relate the causes to the site coordination problems and subsequently to the outcomes of the subcontracts was established in this study. The literature review undertaken shows that multiple regression analysis and neural network analysis are the two common methods to for this type of research. As a result, multiple regression analysis is adopted to generate the relationships in form of regression equation and neural networks analysis is used to validate the result.

CHAPTER FOUR

DATA COLLECTION

4.1 Introduction

To meet the research objectives, this research comprised seven stages of work. This chapter explains the methodology and approaches adopted to collect the data for this research. The purposes of the interviews to experienced industrial practitioners and the design of the questionnaire surveys including the aim of the questions, the format the questionnaires, the data collection methods adopted for each stage of research work are explained.

4.2 Approaches adopted for each stage of work

4.2.1 Stage One: Measuring the performance of subcontractor

Most well-established construction firms have already developed their own systems to periodically review the performance of their subcontractors. However, they are very reluctant to release the details of the system to the public. This survey was designed to collect the viewpoint from main contractors' staff as a reflection to the viewpoint of the companies. A list of common performance evaluation criteria was prepared based on the literature review findings. Seven experienced industrial practitioners were invited to comment on the appropriateness of the criteria selected for the research and the approach adopted to classify them. This was found to be a good approach for ensuring of each criterion was examined. The comments from interviewees would be accepted if they were suggested by all of them. Appendix F shows the background information of the interviewees and the flow of the interviews.

The questionnaire for this survey has been presented in Appendix C. Question 1 and Question 2 of the questionnaires were used to collect the information of the current positions of the respondents in their firms and their years of experience in building industry to support the reliability of the data. Question 3 requested the respondents to rate the level of importance from 1 (very important) to 7 (very unimportant) with 0.5 interval to the essential subcontractor performance evaluation criteria identified through the literature review in Chapter Three. The questionnaires were randomly distributed through private relationship to the industrial practitioners in order to ensure the respondents had worked in main contracting firms.

4.2.2 Stage Two: Factor governing the performance of subcontractors

Three construction managers and three foremen of main contractors were interviewed as a means of data collection. They were asked to express the perspectives of the management and frontline staff respectively. In order to obtain the views from different sides, three project officers of the subcontractors were also interviewed. During the interviews, the interviewees were reminded to refer only to the three basic project objectives, i.e. time, cost and quality, in making their options so as to maintain the consistence of the assumptions. Interviewees assigned a score from 1 (very unimportant) to 10 (most important) to each of the factors influencing the performance of the subcontractors that were shortlisted through the literature review and give a short explanation for their options. The flow of the in-depth interview and the information of the interviewees are attached as Appendix G.

4.2.3 Stage Three: Site coordination problems

A preliminary list of common site coordination problems was prepared through the literature review. Seven experienced industrial practitioners (see Appendix F) were invited to comment on the appropriateness of the problems selected for the research and the approach adopted to classify them. The suggestions would be added into the preliminary list if they were advocated by all of the interviewees.

A questionnaire survey was adopted for this stage of work and the questionnaires were distributed to industrial practitioners through private relationship. Question 1, Question 2 and Question 3 are used to collect the background information of the respondents. As the overall degree of influence of the problems on subcontractors' performance depends on their frequency of occurrence as well as the potential degree of impact on site work, respondents were requested to rate: from 1 (never happen) to 9 (happen every time) with a 0.5 interval for the frequency of occurrence; and from 1 (very unimportant) to 9 (very important) with a 0.5 interval for the degree of potential impact to site work for each problem based on their current projects or experiences. In this 9-points scoring scale system, 5 represented a problem that occurred fairly frequently and had neutral importance to site works. A copy of the questionnaire is attached as Appendix D.

4.2.4 Stage Four: Causes of site coordination problems

A questionnaire survey method was adopted for this stage of work. A preliminary list of the key causes to site coordination problems was prepared through the literature review. Nine experienced industrial practitioners (see Appendix F) were invited to comment on the appropriateness of the cause selected for the research and the approach adopted to classify them. The suggestions would be added into the preliminary list if they were recommended by all of the interviewees.

The questionnaires were distributed to industrial practitioners through existing relationships. Question 1, Question 2 and Question 3 are used to collect the background information of the respondents. Respondents were requested to rate each identified causes in terms of: the degree of contribution by the cause to the problems from 1 (very unimportant) to 9 (very important), with a 0.5 interval; and the frequency of occurrence of the cause in HK building projects from 1 (never happen) to 9 (happen every time), with a 0.5 interval. In this 9-points scoring scale, 5.0 represented a cause that fairly contributed to the site coordination problems and occurred fairly frequently in the HK building projects. A copy of the questionnaire has been presented in Appendix E.

4.2.5 Stage Five: Forecasting the performance of subcontractors & Stage Six: Contribution of the causes to site coordination problems

A questionnaire (see Appendix A) was designed to collect data for Stage Five and Stage Six studies; and to estimate the amount of subcontractors' productivity waste due to poor site coordination by main contractors that justify the need of the research in Chapter One.

Two hundred and sixty-five questionnaires were distributed to construction companies by post. The companies were randomly selected from the Hong Kong Builder's Directory 2005-06 which listed over 1,500 construction companies in Hong Kong, and the information from the industrial practitioners. This method aimed to get the replies from the reputable main contractors and subcontractors. The mailing addresses are shown in Appendix H. In order to get some responses from the small size subcontractors to balance the views, the questionnaires were also distributed to industrial practitioners through private relationships. A brief introduction of the aim and the format of the questionnaire had been given to the industrial practitioners that fill the questionnaire and help to distribute the questionnaires. The questionnaire comprises five sections.

a. Section A (background information of the respondents)

The section aims to collate the background information of the respondents. Respondents were requested to state the nature of the business of their companies and guided to complete the appropriate sections of the questionnaire. The respondents' current positions in their firms and their working experience in construction industry were also requested. The information would be used to assess whether the replies could be regarded as the common views of the industry. Based on the nature of business, replies were classified into following three types:

i. Type One: respondents working in subcontractors that need to complete all parts of the questionnaire;

ii. Type Two: respondents working in main contractors that need to complete Section A, Section B, Section D and Section E of the questionnaire; and

iii. Type Three: respondents working in consultant firms and property developers that need to complete Section A, Section B, Section D and Section E of the questionnaire.

Type One respondents were requested to answer the questions based on their current projects or the projects that had the highest contract sums if they were handling several projects at the same time currently. Type Two and Three respondents were requested to answer the questions based on their experience for Section B, and their current projects or the projects that had the highest contract sums for Section D and Section E if they were handling several projects at the same time currently.

b. Section B (productivity waste)

The aim of this section is to collate quantity evidence on the complaints from subcontractors regarding the poor site management by main contractors. Type One respondents were asked whether they agreed that their firms were unable to carry out site work effectively and efficiently due to poor site coordination by main contractor of their projects. They were requested to assign a percentage to represent their views on the amount of their productivity that had been wasted due to site coordination problems caused by main contractors. Based on their experience, Type Two and Three respondents were asked whether they agreed that subcontractors were unable to perform site work effectively and efficiently due to poor site coordination by main contractor of their projects. They were requested to assign a percentage to represent their views on the amount of their productivity that had been wasted due to site coordination problems caused by main contractors.

c. Section C (project outcomes)

This section is designed to collect the data of the outcomes of the current subcontracts of the respondents. Jasekskis *et al* (1991) used a 3-level scale assigned by the project participants to measure the achievement of project outcomes: Outstanding; Average; and Failure. Tam and Harris (1996) used the traditional approach to measure the achievements in time performance and cost performance in a project, i.e. to compare actual completion time with the estimated contract duration in the tender, and compare the final cost of contract with tender respectively. Regarding the quality performance, a 5-level scale was adopted in which the quality of work was compared with the contract specifications. The scale ranges from poor quality compared with the specifications to good quality compared with the specifications.

The model to measure the subcontract project outcomes in this research is developed based on the approach used by Tam and Harris (1996). As multiple regression analysis method would be used to compute the data, respondents were requested to assign a score from 10 (represent 100% achievement) to 0 (represent 0% achievement) with a 0.5 interval to represent their views on the level of achievements in time performance, cost performance and quality performance in their current projects. The score of achievement in time performance is the comparison of the progress of work with the project programme. The score of achievement in cost performance is the comparison of the expenditure with the project budget. The score of achievement in quality performance is the comparison of the actual level of workmanship with the expected industrial trade standard for the project because the findings of the survey on project performance evaluation in Chapter Five show that respondents prefer to adopt the industrial trade standard rather than the contract specification as the quality standard for their projects. Respondents could estimate the scores for the achievements in time performance and cost performance based on real figures. The scores are thus more reliable than the score for quality achievement as it is estimated mainly based on the professional judgment of the respondents.

d. Section D (site coordination problems)

The aim of this section is to collect data to establish the relationship between the six critical site coordination problems with the project outcomes. Respondents were requested to assign a score from (10 occurred in every site operation) to 0 (never occurred in site operation) with a 0.5 interval to show the frequency of occurrence of the site coordination problems caused by main contractors in their current projects.

e. Section E (causes of site coordination problems)

This section aims to collect data to formulate the relationship between the twelve essential causes with the six critical site coordination problems. Respondents are requested to assign a score from 10 (totally agree) to 0 (totally disagree) with a 0.5 interval to represent their views on the contributions of the causes to the occurrence of the six critical site coordination problems.

4.3 Summary

The preliminary lists for performance evaluation criteria, important factors governing the performance of subcontractors, common site coordination problems and key causes to site problems were prepared based on the findings from the literature review in Chapter Three. Interviews to experienced industrial practitioners were conducted in different stages of work in order to obtain the comments on the preliminary lists for the questionnaire surveys and rank the importance of the factors governing the performance of subcontractors in Stage Two work.

Questionnaire surveys were used to collect quantity data for estimating the productivity waste due to site coordination problems, identifying the critical site coordination problems and the essential causes to the problems, and establishing the link to forecast the impact of the critical site coordination problems to subcontract outcomes and the contributions of the essential causes to the problems. The questionnaire surveys were designed based on the guideline by Babbie (1992). The questions of the questionnaires were simple, short and in a self-administrated format. Respondents could complete the questionnaire within a few minutes and needed not to disclose the confident information of their companies.

CHAPTER FIVE

MEASURING THE PERFORMANCE OF SUBCONTRACTORS

5.1 Introduction

In order to identify project related important factors for subcontracts for local building projects in Hong Kong, it is necessary to define the criteria that are used to measure the outcomes of the subcontract. Time, cost and quality are the three most common fundamental project objectives for a building project from the client's point of view (Stuckenbruck, 1981; Bennett, 1983; Walker, 1990). In recent years, due to the rapid development in terms of the complexity and size of construction projects, broader project objectives are being introduced. For example, Ofori (1992) defined the environmental issues as the fourth dimension to construction project performance. Sustainable construction is currently a popular topic in Hong Kong and many other countries. It could be considered as another essential objective for a project in the near future. The aim of this chapter is to identify the essential criteria that main contractors currently use to evaluate the performance of their subcontractors.

5.2 Research methodology

A literature review on the evolution of performance assessment for building projects has been presented in Chapter Three. Based on literature review and the advices from the experienced industrial practitioners, essential subcontractor performance evaluation criteria for building construction projects were shortlisted as shown in Table 5.1. These were grouped into different objectives including time, cost, quality, safety and health, sustainability, potential for long-term development and company image. Respondents who had worked in main contracting firms were requested to rate the level of importance from 1 (very important) to 7 (very unimportant) with 0.5 interval to the essential performance evaluation criteria. The questionnaires, attached as Appendix C, were randomly distributed through private relationship to the industrial practitioners and 27 valid replies were received. A summary of the replies is attached as Appendix I.

Table 5.1: Average score of the subcontractors' performance evaluation objective and criteria

		Overall score
Objective:	**Time**	1.58
Criteria:	Progress of work follow schedule	1.41
	Propose method to speed up progress	1.76
Objective:	**Safety and health**	1.93
Criteria:	Follow safety rules	1.88
	Propose method to eliminate potential danger to workers	1.98
Objective:	**Quality**	1.98
Criteria:	Quality of work comply with specification	2.04
	Quality of work comply with trade standard	1.91
Objective:	**Cost**	1.99
Criteria:	Amount of claims to main contractors	2.01
	Contributions on reducing construction cost	1.98
Objective:	**Potential for long-term development**	2.38
Criteria:	Application of advance technology	2.64
	Relationship with	
	a. Site representatives of the client/design team	1.73
	b. Other subcontractors	2.48
	c. Your staffs	2.56
	Administrative issues such as submission of records, sample, shop drawings	2.54
	Availability of additional resources	2.31
Objective:	**Sustainability**	2.74
Criteria:	Suggestions to improve the design in terms of:	
	a. Buildability	2.69
	b. Durability	2.86
	c. Maintainability	2.86
	Amount of nuisance such as duct, noise, vibration etc generated	2.66
	Amount of construction waste generated	2.61
	Material wastage level	2.76
Objective:	**Public image**	3.32
Criteria:	Site tidiness	3.19
	Worker's working uniform	3.45

5.3 Data analysis

The survey findings can be regarded as a manifestation of the common views of the industry as 44.4 per cent of the respondents have over eight years of working experience in construction industry. Table 5.1 shows the mean of the scores assigned by the respondents to each criterion. This reflects the level of importance of these criteria in assessing subcontractors' performance. In this study, it was assumed that all the criteria are of equal importance to their respective performance evaluation objectives. Thus, the score for the performance evaluation objectives is the mean of the score of the criteria in the same group, as shown in Figure 5.1. Three experienced construction managers of main contractors were subsequently invited to express their views on the survey data through well-structure in-depth interviews. The following section summarises the general observations of their views.

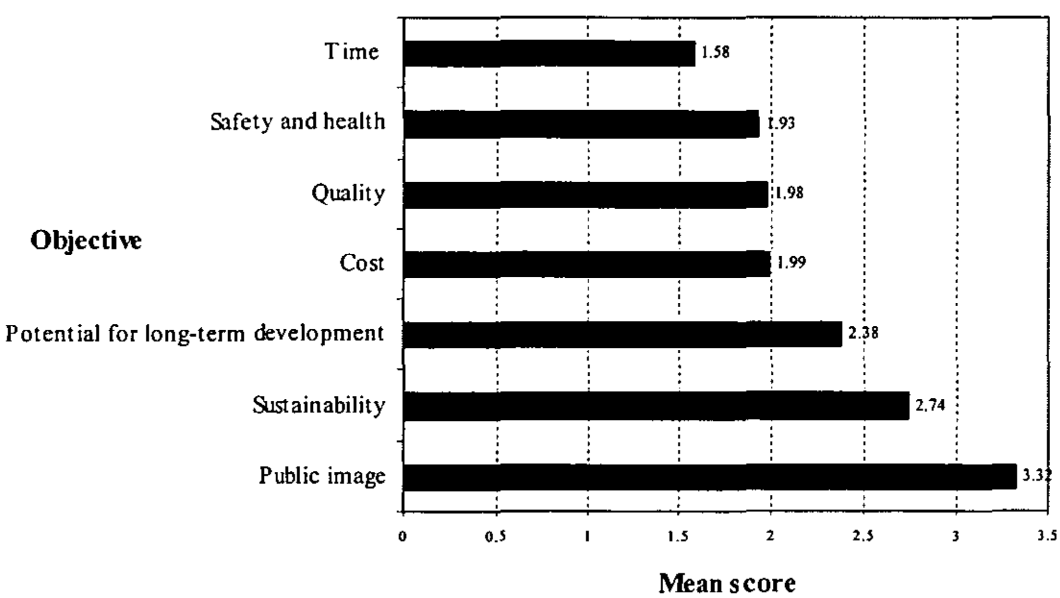

Figure 5.1: Mean score of performance objective

5.3.1 Time

Time was the most important subcontractor performance evaluation objective among the short-listed criteria for building projects. Its average overall score was 1.58, indicating that most of the respondents considered this as a priority target for their projects. The main reason being that performance in relation to this objective can be easily quantified by measuring the variance between the contract and actual project completion date. Respondents in general adopted a conservative approach to the management of their projects, for example, they prefer their subcontractors to strictly follow the project programme rather than propose new methods to speed up progress.

5.3.2 Safety and health

The average score for the Health and Safety objective was 1.93. The importance of this objective is slightly higher than those for quality and cost because construction companies have to face litigation and the site managements may be liable for personal responsibility for serious accident. Safety and health issue for building construction projects is receiving more government attention in the recent years, for example, the Buildings Department issued the Technical Memorandum for Supervision Plans to specify the safety requirements for different grade of construction work and request the contractor to submit a supervision plan at the time of application for consent to the commencement of works.

The questions for assessing the criteria of this objective were similar to those for time. Respondents displayed a similar attitude for this item. They request their subcontractors to follow the basic safety rules and do not expect them to propose new construction methods to eliminate potential dangers to workers. The survey shows that well-experienced respondents were far more ready to accept new method for site safety management. Perhaps, this may be a warning signal to voice out the dissatisfaction of the site management on the current safety management system.

5.3.3 Quality

The average score for this objective is 1.98, rated as only a fairly important factor because it is difficult to quantify the overall level of workmanship of a project. Construction projects comprise thousands of small jobs and it is impossible to review all of them so as to consolidate a final score to represent the quality standard of a project. Another reason for not ranking quality as the top priority objectives being that the property developers always set a very tight programmes for their projects due to high land costs. They need to make trade-offs and relax the demand on the quality of works provided that the project can be completed on time. Consequently, main contractors spend most their efforts to push their subcontractors to meet the tight project programme and the control on the quality of work would be of second priority.

One possible way of measuring the quality of construction work is to assess the degree of compliance of the work to the agreed standards. Works Specification of the contract is the official standard of workmanship for a project. Respondents prefer to adopt the industrial trade standard rather than the Works Specification of the contract as the quality standard for their projects. This is because most of the standards specified in the Works Specification are unreasonably high in view of current tender price.

5.3.4 Cost

As commercial companies, it is no doubt that the prime objective of main contractors to maximize profits from their projects. However, the respondents take another view when assessing the performance of their subcontractors. Excessive claims to main contractor may cause additional financial burdens to the project. However, the survey shows that respondents do not rank this as a very important issue because main contactors are always in a favourable position when assessing subcontractors' claims. The average score for this criterion is thus only 1.99.

In Hong Kong, it is common for main contractors not to pay their subcontractors for claims unless they have got the payment for the respective variation order from the client. Final account preparation is a long process and it is also easy for the main contractors to find excuses to reject claims. Most of the local subcontractors are small companies and would not initiate legal action immediately even though their claims are supported with solid evidences. Their main concern is that the additional payments do not always cover the expenses. Instead, they would desire the main contractor to compensate their losses by awarding them high profit margin contracts in the future if long-term relationship is maintained.

5.3 5 Potential for long-term development

Long-term relationships are a key ingredient required to cultivate the mutual trust between main contractors and their subcontractors, which can significantly improve their performances. Main contractor would evaluate the potential ability of their existing subcontractors as this is one of the considerations to commit long-term co-operation plan with them. However, according to the survey result, this is not considered as a very important criterion as its overall average score is only 2.38.

Because of temporarily contractual relationships between the two parties and commercial secrets, main contractors do not expect to learn too much advance technology from their subcontractors. On the reverse, they may allocate additional efforts to help the subcontractors to build up good relationship with the design team/client's site representative. Subcontractors are not demanded to have strong ability in handling general administration work.

5.3.6 Sustainability

The average overall score for this item was 2.74, probably because sustainability is a new concept to the local construction industry and is not easy to measure and quantify. Most of the experienced industrial practitioners did not learn about the Sustainable Development concept in their formal study years ago. They tended to relate the concept with prefabrication technique and green building design. They also tended to claim that additional resources are required for arranging environmental protection provisions for the project. A set of questions under this evaluation objective is designed to review their understandings on the different issues in the context of sustainable construction technology.

In local multi-layers subcontracting system, almost all the production work of a construction project is actually carried out by the subcontractors. They are therefore well-qualified to suggest alternative proposal to improve the design in terms of buildability, durability and maintainability of the construction work. Among these three items, buildability is most important one because a constructible design can significantly speed up the progress as well as to enhance the quality of the work. Durability and maintainability are less essential to contractors because these issues will be out their businesses after the property is handed over to the client. Main contractors are relatively more concerned about subcontractors' performance in reducing the nuisances and wastes generated from the construction operations rather than on improving the design because they need to fulfil the stringent control imposed by local government.

5.3.7 Public image

Marketing is a difficult task for construction companies. To upgrade the competitiveness of the company, they have started to allocate extra resources to this area. Apart from the development of company marketing plans, the efforts by the site staff should not be neglected. Tidiness of subcontractors' site facilities and their workers' working uniforms are crucial factors that influence public's impression on a project. This subsequently affects the image of the company. The survey result shows that site staffs do not regard this item as an important criterion as its average overall score is 3.32. They think that public would not keep close view on their projects unless it is landmark building. They prefer to concentrate their effort on the production work and the company marketing work should be centrally organized by head office.

5.4 Summary

In Hong Kong, the role of main contractor has already been transformed from the actual production work to the management of the subcontractors. This study has made an attempt to analyze the criteria that they are using to assess the performance of their subcontractors.

According to the survey result, time is the most important criteria to evaluate the performance of subcontractors. With the increasing public concerns on the safety and health issues of the construction projects, this item has become as important as the other two traditional indicators, cost and quality. Respondents in general adopted a conservative approach to manage the matters related to time, safety and health. They demand their subcontractors to strictly follow their instructions.

Quality and cost are fairly important factors. Industrial trade standards are used to compare subcontractors' quality of work. Subcontractors are expected to make contribution in reducing the construction cost. Main contractors are not keen to review the potential abilities of their subcontractors for building up long-term relationship. Instead, they would like their subcontractors to maintain a good relationship with the site representative of the client and design team.

Sustainable Construction is a new concept to the local construction industry in Hong Kong. Main contractors currently do not strongly request their subcontractors to adopt the Sustainable Construction methods and to input additional resource for building up company image. However, it is expected that sustainability would be regarded as an essential objective that may be embedded within quality in near future when more and more local construction companies recognize the benefits they can gain from adopting the Sustainable Construction methods.

As a conclusion for this study, time, safety and health, quality and cost are regarded as the most essential criteria that currently used by the main contractors to assess the performance of their subcontractors. A study to investigate the factors governing the time, quality and cost performances of subcontractors is presented in the Chapter Six. The study did not include the safety and health criterion because there is no commonly agreed method to quantity and measure the achievement of this item. Thus in the typical HK building contract, the developer would only stipulate his requirements in terms of completion time, project price and the required standard of workmanship.

CHAPTER SIX

FACTORS GOVERNING THE PERFORMANCE OF SUBCONTRACTORS

6.1 Introduction

The essential criteria required to measure the performance of subcontractor have already been discussed in Chapter Five. Time, cost and quality were identified as the essential project outcomes of subcontracts for local building projects. There is an endless list of factors affecting the outcomes of a project. Certain factors have more impact than the others. Rockart (1982) used the term 'critical success factors' to describe these factors and are defined as those factors predicting success on projects.

The aim of this Chapter is to identify the main factors affecting the performance of a subcontractor and subsequently the outcomes of a subcontract in Hong Kong based building projects from the different perspectives of key participants in a subcontract. The key participants include the management and frontline staff of both the main contractor and subcontractors.

6.2 Important factors

Publications on the important factors affecting building project outcomes have been reviewed in Chapter Three. A list of factors shown in Table 6.1 that could affect the performance of a subcontractor was developed based on the various studies on the determinants of the main contract outcomes. Most of the factors normally considered to have impact at a main contract level were not included as their impact at the subcontract level was considered to be somewhat remote. Adopting the model developed by Tam and Harris (1996), the factors were classified into the three main categories discussed below.

a. Inherent project characteristics

The inherent project characteristics include the nature and complexity of the subcontract work, and the relationships among the key participants. These factors contribute to the basic constraints and characteristics of the project

b. Ability of the key participants

The ability of the key participants refers to the knowledge, experience and company support their companies. These factors can impact on the potential to achieve tasks assigned under the subcontract.

c. Influence of the participants to the subcontracts

There is no guarantee to the success of a project even though the project has favourable inherent project characteristics and is handled by competent project participants. The influences made by the participants can enhance or even spoil the performance of the subcontractor.

6.3 Research methodology

Nine experienced industrial practitioners were interviewed as a means of data collection. All the interviewees had more than eight years working experience in the industry and were from different firms. During the interviews, the interviewees were reminded to refer only to the three basic project objectives, i.e. time, cost and quality, in making their options so as to maintain the consistence of the assumptions. Interviewees assigned a score from 1 (very unimportant) to 10 (most important) to each of the factors influencing the performance of the subcontractors and give a short explanation for their options. The flow of the in-depth interview and the information of the interviewees are attached as Appendix G.

Table 6.1: List of factors discussed during the interviews

Category	Factors
Inherent subcontract project characteristics	Complexity of the works
	Use of new technology
	Restrictions due to environmental factors
	Unrealistic contract duration
	Quality of the design document
	Buildability of the design
	Relationships among the participants
	Payment methods
	Incentive scheme
	Perceived profitability
	Risk sharing between the main contractor and subcontractors
	Involvement of the subcontractor in the design work
	Clarification of the involvement
	Communication system
Ability of key participants of the subcontracts	Technical ability
	Financial ability
	Managerial ability
	Response to change
Influences of the key participants to the subcontracts during construction stage	Plant support
	Material support
	Staff support
	Levels of coordination
	Payment
	Construction communication
	Design changes
	Disputes settlement
	Claims
	Response by the participants

6.4 Data analysis

6.4.1 Common views from the interviewees

Figure 6.1 summarizes the ten most important factors to the performance of subcontractors in a descending order of priority of the mean score assigned by the interviewees. The payment to the subcontractors and the perceived profitability of the subcontract are considered as the two most important factors. They believed that good profit margin could motivate the subcontractor to perform well. However, it is necessary to point out that subcontractors are normally medium to small size firms. In according to the local trade practice, subcontractors have to pay their sub-subcontractors, direct labours and material suppliers twice each month. Therefore, sound cash flow is essential to their survival, which is controlled by the punctuality and the degree of underestimation of the payment to them. A summary of the scores assigned by interviewees is attached as Appendix J.

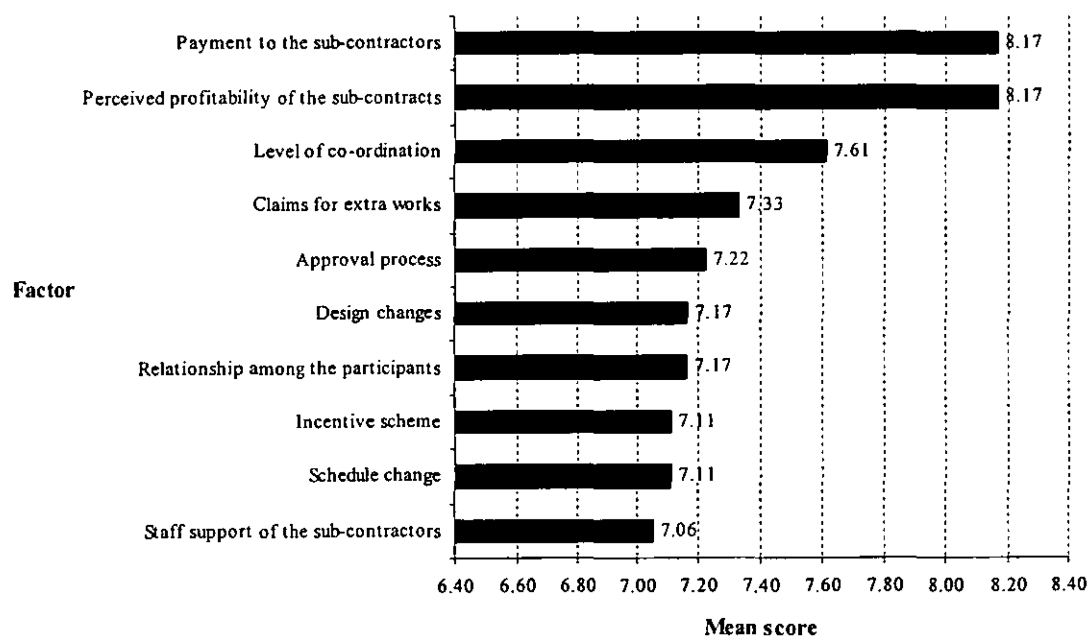

Figure 6.1: Mean score for the factors by the interviewees

6.4.2 Views from main contractor's site management

Table 6.2 shows the ten most important factors to the performance of the subcontractors in descending order of the mean score assigned by main contractors' site managers. The main contractor's site management manages the project from a macro perspective taking into account of the balance between the different objectives of a project. Basically, they would put the progress of work as the top priority objective.

Table 6.2: Ten most important factors from main contractor's site management

Factors	Score
Perceived profitability of the subcontracts	8.00
Payment to the subcontractors	7.67
Approval process	7.50
Level of coordination	7.33
Relationship among the participants	7.33
Understanding on the subcontract works	7.33
Design changes	7.17
Unrealistic subcontract duration	7.17
Staff support of the subcontractors	7.00
Response by design team	7.00

a. Approval process

The approval of shop drawings, material samples and test reports is usually an on-going and complicate process. Delay due to the fault of any of the participants can interfere with the planned sequence of work. Subcontractors are very reluctant to allocate additional effort to re-sequence the work to minimize the delay or to accelerate the following activities to catch up with the programme. Sometimes subcontractors may be willing to risk proceeding with the work without completing the approval process if they have good relationship with the main contractor.

b. Level of coordination

The wages of the workers is calculated on a daily basis. Sub-subcontractors are very much concerned with the productivity of their workers. As the mobility of the workers from project to project is high, sub-subcontractor would only keep their workers in the project if they can work with well organized site conditions, updated and sufficient information, constant workload, sufficient material and attendance from the main contractor etc.

c. Relationships among the participants

Relationships can be one of the inherent project characteristics as some participants may have been working together in the previous projects. Cooperative culture within the project is cultivated through mutual trust. However, it can easily be spoilt by inappropriate actions such as unreasonable late payment to the subcontractors. There are often some grey areas in the subcontract document, which can be clarified and agreed in a mutual beneficial way under a harmonic working environment.

d. **Understanding on the subcontract works**

The tender period for the local projects is normally very short. Both the main contractor and subcontractors usually have insufficient time to digest the document before submitting the tender. Most of the subcontractors also have a perception that the scope and nature of work would not vary too much from project to project. It may have the chance that they underestimate the scope of their works. Main contractors should have the responsibility for explaining the contract works to the subcontractors at the early stage of the project.

e. **Design changes**

Both the main contractor and subcontractors have found it difficult to plan their works if there are a lot of design changes during the construction stage. Although subcontractors can claim for compensation for the abortive work caused by design changes, it normally takes a long time to agree the amount of reimbursement with the respective parties. Subcontractors prefer to carry out their works without any disturbance and receive the payment on time in order to maintain a sound cash flow.

f. **Unrealistic subcontract duration**

Most of the contract duration of local projects is very short. However, subcontractors would still be willing to take up a job even though unrealistic contract duration is imposed because of keen competition in the industry. Under this situation, subcontractors will always seek opportunities to claim for extension of time for their contracts. This would dilute their efforts in monitoring their works and subsequently deteriorate the friendship relationship with the other parties.

g. Staff support of the subcontractor

Because of low profit margin or inability of the managerial staff, subcontractors just sub-let the work to their sub-subcontractors without providing any necessary guidance and supervision. As it is difficult to map a clear picture of the responsibility of the defective work under the multi-level subcontracting system, the sub-subcontractors would be no doubt to use the fastest method to complete their works with no concern to other parties. This of course would increase the demand of coordination work to the main contractor.

h. Response by the design team

Slow response of the design team to the requests such as outstanding construction information, attendance to the site test and operations etc. would cause a lot of unnecessary delay to the subcontract works. Subsequently, subcontractors would be discouraged and slow down their progress of work.

6.4.3 Views from main contractor's frontline staff

Table 6.3 shows the ten most important factors to the performance of the subcontractors in a descending order according to the mean of score assigned by the main contractors' frontline staff. The main contractor's frontline staff are those directly responsible for the site production work. They mainly concentrate on controlling the progress and the quality of the works. Most of them are not over sensitive to the cost implication in making any decisions because they have the perception that it is the responsibility of the management to control the profit of a project and also normally they do not have the relevant costing information in hand for making the judgement. So their scoring patterns on the critical success factors are a bit different with that of the site management.

Table 6.3: Ten most important factors from main contractor's frontline staff

Factors	Score
Perceived profitability of the subcontracts	8.67
Payment to the subcontractors	8.17
Buildability of the design	8.00
Level of coordination	7.83
Claims for extra work	7.67
Staff support of the subcontractors	7.67
Approval process	7.67
Incentive	7.50
Feedback channel	7.50
Acceptance of new idea	7.50

a. Buildability of the design

Due to tight programme, both the foremen and the subcontractors have to carry out the work with little time to digest the construction information. Design with good buildability can reduce the learning time and thus improve the productivity and quality of work. Buidability (Adams: 1989) is the extent to which the design of a building facilities ease of construction, subject to the overall requirement for the completed building. The buildability of the design can be improved by providing a formal involvement of the front line staffs in finalizing the detail of the work.

b. Level of coordination

This is the main responsibility of the site foreman. The more effort they contribute on the coordination work, the better would be the progress and the accuracy of work. This can avoid unnecessary double handling of work, conflicts among the subcontractors etc. so as to maintain a stable working environment.

c. Claims for extra work

Most foremen understand that the subcontracts tend to have very low profit margins. Claims can provide additional profit to the subcontractors. The Foreman has to provide necessary assistance to the subcontractors in recording the abortive and additional work, and inform site management so that the subcontractors can receive the payment as soon as possible.

d. Staff support of the subcontractors

The subcontractors' representatives normally have to take up several jobs at the same time. So it is quite common that subcontractors just assign a very junior staff to take up the routine site matters and their project in-charge would directly contact the senior management of the main contractor for the contractual issues. In this case, the subcontract work sometimes would be out of control as the junior staff lacks of ability and experience to lead the project.

e. Approval process

Incompletion of the approval process on the samples, shop drawings and test reports is one of the common excuses claimed by the subcontractors for not commencing their work. A clear picture on the latest approval status can assist the foreman to monitor the subcontractors' work.

f. Incentive and feedback channel

Appropriate incentive schemes can motivate people and this is particularly effective for small and medium size firms as they can easily forecast the additional profit in return from the extra efforts contributed to the project. Formal channels to feedback comments on the performance of the subcontractors to the management are also important.

g. Acceptance of new ideas

With the introduction of the new construction methods, materials and management concept, subcontractors have to upgrade their technical knowledge. Sometimes it may take a long time to explain the new construction methods to the subcontractors as they are always reluctant to change.

6.4.4 Views from subcontractors

Table 6.4 shows the ten most important factors to the performance of the subcontractors in a descending order according to the mean of score assigned by the subcontractors. It is no doubt they would put the cost as top priority objective to be achieved in any project. Sometimes, long-term relationship can be scarified in return for immediate profit of a project. They are more flexible in running the project, but quite sensitive to any actions by the main contractor that may affect their profit and cash flow.

Table 6.4: Ten most important factors from subcontractors

Factors	Score
Payment to the subcontractors	8.67
Perceived profitability of the subcontracts	7.83
Level of coordination	7.67
Claims for extra work	7.50
Relationship among the participants	7.33
Treated fairly	7.33
Plant support by the main contractor	7.17
Design change	7.17
Schedule change	7.17
Incentive scheme	7.17

a. Level of coordination

Subcontractors express that the main causes leading to the financial loss in a project are non-productive activities such as double handling of work, idling of workers due to poor coordination by the main contractor. They prefer the foreman to have around one week's advance planning to enable them to schedule the work force among different projects.

b. Claims for extra work

The strategy of the subcontractors to a project would be affected by the altitude of the main contractor towards their claims for extra works. They would become conservative in taking any pro-active actions to optimise their performance if their claims have been unreasonable rejected

c. Relationships among the participants

No contract document is perfect and can define all details of the works clearly. Under a co-operative working relationship, subcontractors would willing to carry out some extra works for no payment because they believe that main contractor would compensate them in another way later such better site storage areas and access route for delivering the materials.

d. Treated fairly

All subcontractors in a project must be treated fairly in terms of plant and material supports, priority of using the access road etc. Conflicts among subcontractors can cause never-ending problems to the project.

e. Plant support by the main contractor

Due to poor planning of work and lack of coordination, subcontractors complain the main contractor of not providing the necessary plants support to their work such as using the tower crane to deliver the heavy materials to the work place. This would cause the unnecessary wastage of manpower to the subcontractors.

f. Design change and schedule change

The subcontractors claim that the amount of extra expenses to re-plan the work due to these two problems would not easily be justified and to form a formal claim for reimbursement of money.

g. Incentive scheme

Subcontractors welcome any incentive scheme as they have a clear target to work for and it can provide additional profit to the project. However, they point out that the scheme must be well defined with achievable standards. On the other side, incentive schemes can spoil the mutual trust spirit between the main contractor and the subcontractors if it only demands the subcontractors to contribute additional resource without equal amount of rewards.

6.5 Summary

Unlike the main contractor, subcontractors may not have long-term planning and commitment to the industry. Thus, they would optimize their performance only if they have reasonable profit margin and can maintain a sound cash flow through out the project. During the construction stage, effective and efficient site coordination by the main contractor is important to ensure that subcontractors can proceed with their work. Besides, main contractor should provide necessary assistance to the subcontractors to prepare the claims for reimbursement for the extra work done and maintain an efficient shop drawing, material sample and test report approval system. Frequent design and schedule change would cause unnecessary disturbance to subcontractors' work. Good relationships between the participants and the support from the subcontractors can also affects the outcomes of subcontracts. Finally, appropriate incentive schemes can motivate subcontractors to improve their performance.

As main contractor's site coordination would have direct influence to the performance of their subcontractors, a study was conducted to identity the critical site coordination problems that hinder subcontractors' site work and the analysis of the study is presented in the next chapter.

CHAPTER SEVEN

SITE COORDINATION PROBLEMS BY MAIN CONTRACTORS

7.1 Introduction

There are many factors that affect project performance, with the subcontractors' performance being one of the most important factors. Chapter Six reports a study to identify the key factors affecting the performance of the subcontractors in the building construction projects in Hong Kong. The study shows that main contractor's site coordination is the most important influencing factor for subcontractors during the construction stage. This Chapter is an extension of that survey. It aims to identify and analyse the site coordination problems such as insufficient construction information and inaccurate interfacing works caused by the main contractors that can hinder subcontractors' performance on local building projects. A questionnaire survey has been conducted to identify and analyse the frequency of occurrence and potential impact on subcontractors' performance of the problems. The aggregated importance of the problems is analysed.

7.2 Common site coordination problems

Eighteen site coordination problems caused by the main contractors that influence subcontractors' time, cost and quality performance were identified through literature review presented in Chapter Three. One more problem was added to the list after the interviews to the experienced industrial practitioners: *inadequate or insufficient site reference point*. These problems were categorised into the following eight groups.

a. Construction information

Due to the rapid development of construction projects in terms of size and complexity, the amount of project related information has increased substantially. Many property developers in Hong Kong set very tight programmes for their projects due to high land prices, consequently, construction details are often only finalised just before the site operations start. There is thus little time for the main contractor to analyse, extract and highlight the essential information from the construction information provided by the design team. Consequently, subcontractors have to perform the work with little time to digest or question the information provided.

b. Working programme

Planning to complete a construction project without an agreed time frame is asking for failure. A working programme provides a common reference and serves as the basis for the actions by all who use it. An easy understandable and well-detailed working programme can help subcontractors to understand and achieve the contractor's targets for the project. The logic shown in the working programme should be practical and fully recognise the characteristics of local industrial practices to avoid misunderstanding among the project participants. Subcontractors cannot efficiently and effectively organise their resources for the project if they have very short notice for commencing site work and the working instructions are revised at the last minute.

c. Preparation for work place

The working environment can have a substantial impact on workforce morale. Their productivity can be seriously reduced if the work place is below accepted standard such as full of rubbish and water, or inadequate levels of fresh air and artificial lighting in confined working places. Insufficient and inadequate reference points can directly affect the progress of work and workmanship. As few of the local workers have had any technical training course and thus little knowledge of site surveying techniques, they often cannot set out their work without considerable assistance with the main contractor. According to the local standard form of subcontract, main contractors have to arrange temporary works including scaffolding, water and power supply to subcontractors. As subcontractors tend to be experts in their related trades, they tend to perform most of the site work and not the main contractor. Therefore, they need to be consulted on temporary work design such as the layout of the scaffolding and working platform, locations of the water and power supply to avoid unnecessary doubling handling of temporary work provisions.

d. Interfacing work to be completed by other subcontractors

The number of subcontract packages on most Hong Kong building projects ranged from 17 to 54 (Lai, 1987). The subcontracting approach creates many interfaces between various packages of work. Site problems and disputes with subcontractors frequently arise if the scope of works is not well-defined. In the multi-level subcontracting system of Hong Kong, main contractors' instructions can take a several days to pass through many levels before reaching the subcontractor that actually carries out the work. Subcontractors may not able to complete their own part of the interfacing work on time or to the quality required because they are unable to receive the latest working instructions and the content of the instructions may be distorted due to the over-long communication path. As the packages performed by different subcontractors are highly inter-related, late completion in one may delay the subsequent activities to be carried out by subsequent subcontractors, thus leading to a delay of the overall project progress. In order to minimize the impact to the project, subcontractors may need to split their site operations into several phases, however, this could cause unnecessary waste of manpower and results in claims from the subcontractors.

e. Access to work place

The time available for work may be reduced and workers' morale is adversely affected if they need to take a long time to arrive the work place due to inconvenient access route and adequate provisions. Construction workers can be exposed to unnecessary dangers if main contractor does not provide adequate access such as ladders and covered walkways.

f. Plant support

On most projects, subcontractors tend to have limited involvement which does not justify arranging expensive plant such as hoists. The main contractor usually responsible for providing and operating the major items of construction plant upon which the subcontractor relies. However, many main contractors tend to provide the minimum amount of plants in order to reduce costs. To avoid disputes among subcontractors, especially in the early morning when most of the subcontractors want their equipments as soon as possible, main contractor should establish a system to coordinate the requests from the subcontractors.

g. Material support

Abduk Kadir *et al.* (1997) established that material shortage was the most important and frequently occurring problem adversely affecting construction labour productivity in Malaysia. In Hong Kong, most local domestic subcontractors are usually employed on a labour-only contract basis and paid on a daily basis, thus resulting in a highly mobile workforce. Construction materials are provided and delivered to the subcontractor's workface by main contractor. The subcontractors are very much dependent on the productivity of their workers and cannot afford to have their workers idle due to a lack of materials. Thus, subcontractor will only keep their workers on the project if main contractor can organise sufficient amounts and appropriate types of material for the work on time.

h. Response to site problems

All buildings are unique in terms of design. Unforeseen site problems are encountered every day. Subcontractors sometimes need to reschedule or even to suspend their work due to unresolved site problems. This can consume significant amounts of manpower if main contractor does not recommend practical solutions early enough. The main contractor is a bridge between the subcontractor and the design team. Delays in forwarding requests such as outstanding construction information, attending to the site test and operations etc. could cause a delay to the site work. Sometimes subcontractors may be willing to take the risk of proceeding with the work without completing the approval process if they have good relationship with the main contractor, however, they may become discouraged and slow down if this happens too often.

7.3 Research methodology

A questionnaire survey was adopted in this study. The questionnaires were distributed to industrial practitioners through private relationship and 35 valid replies were received. The overall degree of influence of the problems on subcontractors' performance depends on their frequency of occurrence as well as the potential degree of impact on site work. Based on their current projects or experiences, respondents were requested to rate: from 1 (never happen) to 9 (happen every time) with a 0.5 interval for the frequency of occurrence; and from 1 (very unimportant) to 9 (very important) with a 0.5 interval for the degree of potential impact to site work for each problem. In this 9-points scoring scale system, 5 represented a problem that occurred fairly frequently and had neutral importance to site works. A copy of the questionnaire is attached as Appendix D

Table 7.1: Mean score for site coordination problems to subcontractor's performance

		Mean score (Frequency) (F)	Mean score (Potential Impact) (PI)	Aggregated importance score (F x PI)
Factor:	**Construction information**			
Problems:	a. information not detail enough	7.08	5.65	40.00
	b. unclear or contradictory information	7.10	6.25	44.38
Factor:	**Working programme**			
Problems	a. working programme not detail enough	4.65	4.38	20.37
	b. working sequence not practical	3.95	6.03	23.82
	c. short notice for commencing site work	4.73	6.25	29.56
	d. late change of working programme	3.68	6.13	22.56
Factor:	**Preparation for work place**			
Problems:	a. work place environment not yet prepared such as general site cleaning, fresh air supply, lighting	4.63	3.13	14.49
	b. inadequate or insufficient site reference points	3.10	6.98	21.64
	c. inadequate or insufficient temporary work support such as scaffolding, water & power supply	3.50	5.85	20.48
Factor:	**Interfacing work to be completed by other subcontractors**			
Problems:	a. work not yet completed	5.55	6.05	33.58
	b. work not accurately completed	5.70	6.78	38.65
Factor:	**Access to work place**			
Problems:	a. access road not yet ready	4.60	3.78	17.39
	b. access routing not convenient	3.93	3.05	11.99
Factor:	**Plant support**			
Problems:	a. late to provide plant support	5.10	6.38	32.54
	b. type of plant provided not appropriate	3.63	4.58	16.63
Factor:	**Material support**			
Problems:	a. insufficient amount	2.98	6.40	19.07
	b. type of material provided not appropriate	3.05	5.88	17.93
Factor:	**Response to site problem**			
Problems:	a. late response to site problems	5.03	3.78	19.01
	b. solution recommended not practical	3.40	5.73	19.48

7.4 Data analysis

Table 7.1 above shows the mean of the scores rated by the respondents on the frequency of occurrence and degree of potential impact on site work to each problem. As 9-points scoring scale system was adopted, the problems with mean score over 5.0 were shortlisted for detail discussion because these problems would occur more frequently and had significant impact to site works. A summary of all the data is attached as Appendix K.

7.4.1 Frequency of occurrence

Table 7.2 summarises the problems with mean score over 5.0 assigned by the respondents for frequency of occurrence in a descending order of priority, which can be regarded as common problems in the local building construction projects.

Table 7.2: Frequently occurring site coordination problems

Rank	Problems	Mean score for frequency
1	Construction information unclear or contradictory	7.10
2	Construction information not detail enough	7.08
3	Interfacing work not accurately completed	5.70
4	Interfacing work not yet completed	5.55
5	Late to provide plant support	5.10
6	Late response to site problems	5.03

The top two most frequent problems related to construction information. Their mean scores are well above the other problems. In the recent years, local main contractors have had less time and manpower to organise the construction information for their subcontractors due to the rapid development in terms of the complexity and size of construction projects, and local property developers usually set a very tight programme for their projects. Problems related to interfacing works to be completed by the other subcontractors were founded to be the most fourth and fifth frequent site problems. The survey conducted by Lai (1987) shown that the number of subcontract packages in the typical local building construction projects ranged from 17 to 54. The multi-level subcontracting system in Hong Kong has imposed additional difficulties to the main contractors' site coordination. Main contractors' instructions may take a few days to pass through several levels before reaching the subcontractors that actually carrying out the works. The content of the instructions may also be distorted due to the over-long communication path. Subcontractors are sometimes unable to receive the latest working instructions for their own portions of interfacing work on time and accurately. Late to provide plant support and response to site problems happens fairly frequently as their mean scores are only slightly above 5.

7.4.2 Degree of potential impact on site work

Table 7.3 summarises the problems with mean score over 5.0 assigned by the respondents for the degree of potential impact on subcontractors' site work in a descending order of priority, which can be regarded as essential impact to sub-contactors' performance.

Table 7.3: Significant impact site coordination problems

Rank	Problems	Mean score for potential impact
1	Inadequate or insufficient site reference points	6.98
2	Interfacing work by other subcontractors not accurately completed	6.78
3	Insufficient amount of material support	6.40
4	Late to provide plant support	6.38
5	Construction information unclear or contradictory	6.25
6	Short notice for commencing site work	6.25
7	Late change to working programme	6.13
8	Interfacing works not yet completed	6.05
9	Working sequence not practical	6.03
10	Type of material provided not appropriate	5.88
11	Inadequate or insufficient temporary work support	5.85
12	Solution recommended for site problem not practical	5.73
13	Construction information not detail enough	5.65

Thirteen out of the 19 problems selected for the questionnaire survey were considered as having significant potential impact. Possible explanations for the results are summarised below.

a. Most of the local workers have little knowledge of site surveying techniques. They cannot set out their works unless main contractor can accurately mark the reference points on the work place and provide sufficient construction information.

b. Subcontractors have to split their site operations into several phases if the required interfacing works are not completed accurately on time. Site progress would be seriously affected and consequently additional cost would be incurred due to double handling of work.

c. Most local subcontractors are employed on a labour-only contract basis. Subcontractors cannot proceed with their works without sufficient material, plant and temporary work supports such as power and water supply, lighting and fresh air supply, and scaffolding from the main contractor.

d. Due to tight project programme, subcontractors have to perform the work with little time to digest the construction information. Clear and sufficient construction information could help them to investigate the potential site problems. Subcontractors cannot efficiently and effectively organise their resource for the project if they always have very short notice for commencing the site work and the working instructions are always revised at the last minute.

e. Subcontractors sometimes need to revise or even to suspend their work due to unforeseen site problems. This can consume unnecessary manpower if practical solutions are not recommended by the main contractor early enough.

7.4.3 Aggregated importance score

Aggregated importance score for each problem is taken as the combined scores of frequency of occurrence and the potential degree of impact. Figure 7.1 summarises the aggregated importance score for problems to subcontractor performance in a descending order of priority.

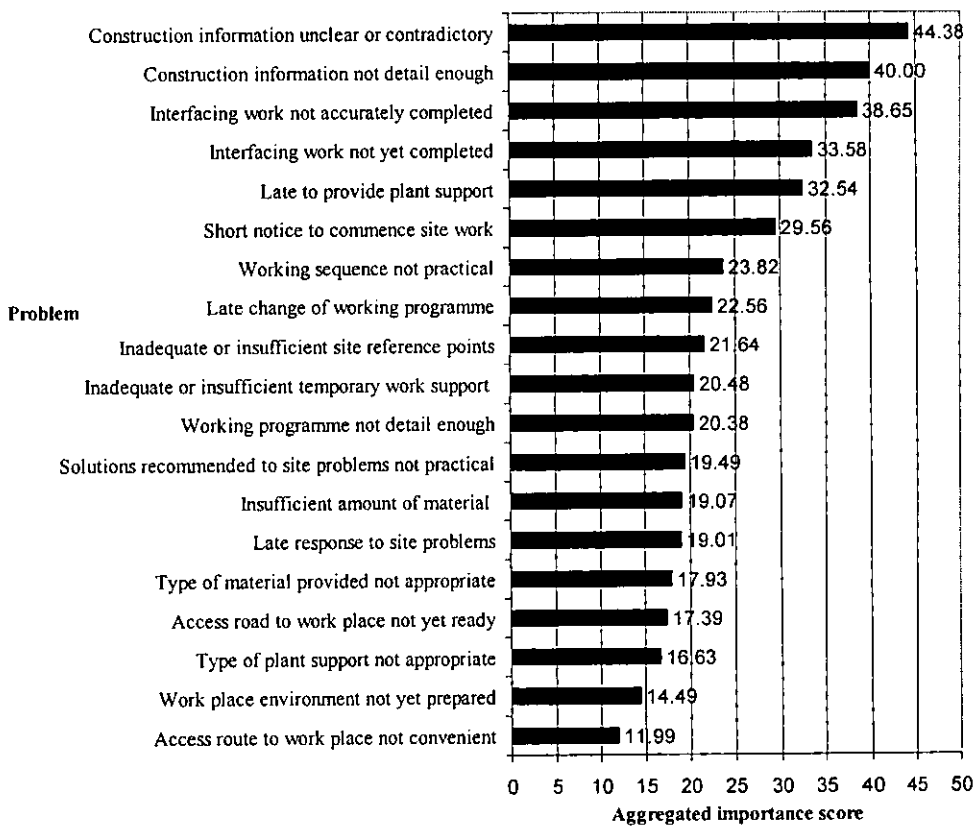

Figure 7.1: Aggregated importance score for problems to sub-contractors' performance

Unclear and contradictory construction information and insufficient construction information were the top two main problems. These two problems have high aggregated importance score because they happen very frequently in the local building construction projects and significant impacts to site works.

Although incomplete interfacing works, inaccurate interfacing works and to provide plant support on time may not frequently happen, they are still the third, fourth and fifth most essential problems because when they do happen they can induce a considerable consequential problems if they are not handled properly.

Time is the most important performance criterion used by the local main contractors to evaluate subcontractors' performance (Ng and Price, 2005). Accordingly, the main contractors try to avoid having too short notice to commence site work, impractical working sequence and late change of working programme. This has lowered their aggregate importance scores even though their potential impact scores are all above 6.

Although inadequate or insufficient site reference points is the most influential problems to subcontractors' site works, it is only the ninth essential problem because most main contractors would establish a strong site surveying team to handle the setting out work for their projects.

7.4.4 Guidelines to enhance site coordination

In this study, the problems were classified into eight types. It was assumed that the aggregated importance score for each type is the mean of the aggregated importance scores of all the problems in that group. This can be acted as a reflection to the overall influence that each type of problem may have on subcontractors' performance. Table 7.4 shows the aggregated importance score for each type of problem in a descending order of priority. These have been used to develop guidelines to help main contractors enhance their site coordination.

Table 7.4: Aggregated importance score for the eight main types of site coordination problems

Rank	Types of problems	Aggregated importance score
1	Construction information	42.19
2	Interfacing works by other subcontractors	36.09
3	Working programme	24.18
4	Plant support	23.89
5	Response to site problem	20.00
6	Preparation work for work place	19.90
7	Material support	18.48
8	Access to work place	14.53

According to the survey results listed in Table 7.4, main contractors should prioritise their organisation of construction information provided to subcontractors. The scope of the interfacing works for each subcontract must be clearly specified and subcontractors should be informed of the working schedule with reasonable advance notice to enable them to organise the logistics for the works. These two items could be achieved through well-prepared subcontract documents and well-organised regular site coordination meetings. Response to site problem and preparation for work place were of almost equal importance. Access to work place had the least impact to subcontractors' performance.

7.5 Summary

Based on literature and advice from experienced industrial practitioners, nineteen common problems caused by the main contractors during the construction stage that could hinder subcontractors' performance on building projects in Hong Kong have been identified. These problems were classified into eight main types of problem associated with subcontractors' site works.

This chapter revealed the six most frequent problems on building projects. Problems relating to construction information and interfacing works were found to be the most frequent problems. Main contractors were often late to provide plant support to subcontractors' works and respond to site problems. Thirteen problems were identified as having significant impact to site works. *Site reference points* and *interfacing works* were found to have the most significant impact on subcontractors' performance.

Aggregated importance scores for the problems were calculated to reflect their degree of importance due to their frequencies and impacts. The results shows that problems related to construction information and interfacing works were considered to be the most important problems to subcontractors' works.

In order to develop guidelines to help main contractors enhance their site coordination, a study on the causes to the important problems identified in this chapter was conducted

CHAPTER EIGHT

CAUSES OF SITE COORDINATION PROBLEMS

8.1 Introduction

Sixteen key causes of site coordination problems were identified from literature. A questionnaire survey was used to identify, shortlist and analyse the six critical site coordination problems that influenced the time, cost and quality performance of subcontractors in the HK building projects (as discussed in Chapter Seven). There are many causes of these problems; the aim of this chapter is to identify and analyse the essential causes related to the six critical site coordination problems. A questionnaire survey has been conducted to identify and analyse the frequency of occurrence of the causes and their degree of contributions to the problems. The aggregated importance of the causes was obtained by combining the degree of contribution and frequency of occurrence of the causes.

8.2 Potential causes of site coordination problems

Sixteen causes leading to site coordination problems due to poor performance of main contractor in a building project were identified through literature review shown in Chapter Three and advices from the experienced industrial practitioners. The causes of site coordination problems were grouped into three categories according to their nature (i.e. staffing; technical and management system), as summarised in Table 8.1.

a. Staffing

There is no guarantee to the success of a project even though main contractor can establish a well organised management system and possess the necessary technical knowledge to meet the nature of the project. Main contractor have to assign staff with necessary technical knowledge and experience to operate the management system. Staffing related causes included: *insufficient staff or staff too inexperienced to coordinate the technical administration work; insufficient staff or staff too inexperienced to coordinate the site work; insufficient directly employed worker to carry out the temporary work;* and *frequent change of personnel.*

b. Technical

Robbins (2005) defined the term technology as to how an organisation transferred its inputs into outputs. As the role of main contractors have already transformed from a constructor to a manager of subcontractors of the local building project, they should have adequate technical capacity to provide necessary assistance to subcontractors to perform well. Technical related causes included: *insufficient technical support from head office; poor temporary work design; insufficient site office space; poor site layout;* and *poor project programme or phasing of work.*

c. Management system

The responsibilities and duties of each member of the project team should be well defined to ensure the activities can proceed without any problems. During the project development process, a dynamic temporarily multi-organisation system is often created that is continuously confronted with disparities between two levels of objectives: the temporary objectives of the construction project; and long-term objectives of the participating organisations and operational phase of the project (Mohsini and Davidson, 1992). Main contractors need to establish dynamic management systems that facilitate the coordination of activities and control the actions of their members. Management system related causes included: *unclear job duties; unclear communication path; insufficient authority for frontline staff; unclear accountability system;* and *too much paper work.*

8.3 Research methodology

A questionnaire survey was developed and distributed to industrial practitioners. Thirty-six valid replies were received. Respondents were requested to rate each identified causes in terms of: the degree of contribution by the cause to the problems from 1 (very unimportant) to 9 (very important), with a 0.5 interval; and the frequency of occurrence of the cause in HK building projects from 1 (never happen) to 9 (happen every time), with a 0.5 interval. In this 9-points scoring scale, 5.0 represented a cause that fairly contributed to the site coordination problems and occurred fairly frequently in the HK building projects. A copy of the questionnaire has been presented in attached as Appendix E. Table 8.1 presents the mean of the scores rated by the respondents. A summary of all the data is attached in Appendix L.

Table 8.1: Causes of main contractor's site coordination problems

		Mean score (Frequency) (F)	Mean score (Contribution) (C)	Aggregated importance score (F x C)
Category	**Staffing**			
Causes	a. staff too inexperienced to coordinate the technical administration work	6.86	6.94	47.61
	b. frequent change of personnel	3.72	6.68	24.85
	c. staff too inexperienced to coordinate the site work	5.76	6.19	35.65
	d. insufficient directly employed worker to carry out the temporary work	6.53	5.81	37.94
	e. insufficient staff to coordinate the site work	5.26	5.50	28.93
	f. insufficient staff to coordinate the technical administration work	5.17	5.23	27.04
Category	**Technical**			
Causes	a. insufficient technical support from head office	6.61	5.03	33.25
	b. poor temporary work design	6.06	4.93	29.88
	c. insufficient site office space	4.53	4.44	20.11
	d. poor site layout	3.17	3.91	12.39
	e. poor project programme or phasing of work	5.14	3.17	16.29
Category	**Management system**			
Causes	a. unclear job duties	7.11	7.09	50.41
	b. unclear communication path	6.44	7.03	45.27
	c. insufficient authority for frontline staff	5.19	6.97	36.17
	d. unclear accountability system	6.67	6.86	45.76
	e. too much paper work	6.56	4.83	31.68

8.4 Data analysis

8.4.1 Degree of contribution to site coordination problems

Figure 8.1 summarises the mean scores assigned by the respondents for the degree of contribution of the causes to the site coordination problems in a descending order of priority.

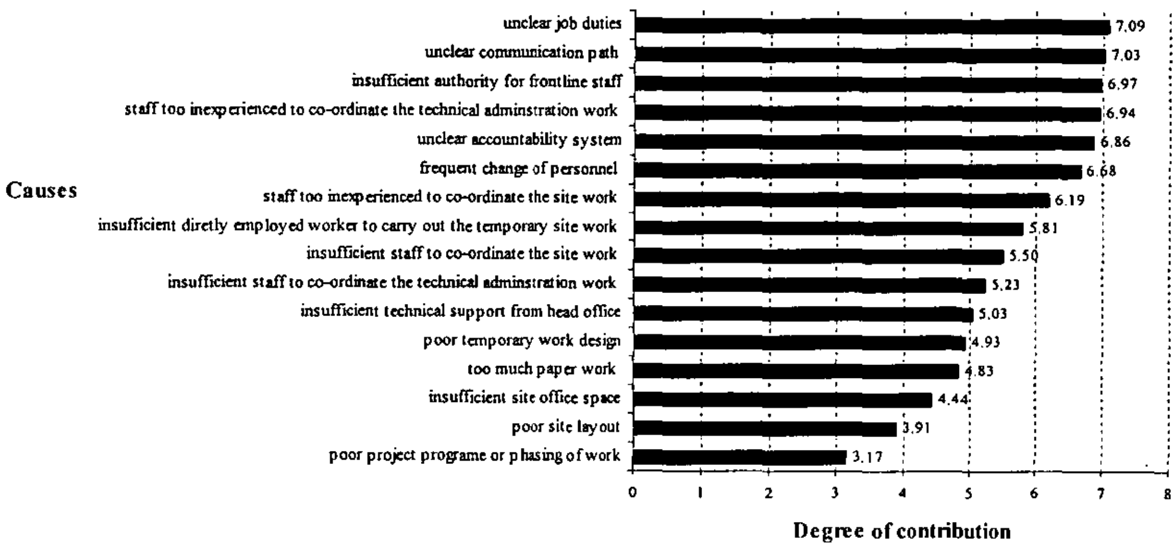

Figure 8.1: Mean score for degree of contribution

Eleven out of the 16 causes selected for the questionnaire survey were considered as having significant (i.e. mean scores are above five) contribution on main contractors' site coordination problems. The top three significant causes relate to management systems. Unclear job duties was found to be the largest contributing cause, probably because scope of work of each building project is different, however, works cannot be proceeded smoothly if the duties of key staff are not well defined. The mean score for unclear communication path is only slightly below the most crucial cause. One frequent complaint from frontline staff in HK building projects is that they have too much responsibility but not enough authority to get the job done. This can be critical in HK building projects where project durations are often relatively short. The authority delegated to frontline staff must therefore align with stated job responsibilities, so that timely decisions can be made.

The role of the main contractor's project coordinator has become critical for the success of local multi-disciplinary construction projects (Jha, 2005). The project coordinator has to handle technical matters as well as management issues and thus needs to be a 'generalist' rather than 'specialist' (Powl and Skitmore, 2005). Due to rapid developments of construction projects in terms complexity and size, information has become so voluminous and complex that it cannot be passed in totality from one individual to the next (Chapman, 1999). Frequent changes of personnel could thus induce unnecessary uncertainties to the project if the appropriate systems are not in place.

Although the documentation requirements of the ISO standards can be extremely onerous and bureaucratic (Love *et al.*, 1998), quality certification to recognized standards such as the International Organisation for Standardization (ISO) 9000 has become common place in HK based construction companies. The survey results show that the increase paper work has not unduly affect the site coordination work with a mean score below five. The bottom three causes relate to technical related cause and their mean scores are all below five.

In this study, it was assumed that all the causes are of equal importance to their respective category of main causes. The score for each category is the mean of the scores of the causes in the same category. Table 8.2 summarises the mean scores for degree of contribution of the categories of main causes to main contractor's site coordination problems. The result shows that management system related causes make the most significant contribution to main contractor's site coordination problems. The technical related causes were not so critical as its mean score was below five.

Table 8.2: Mean score for degree of contribution

Rank	Categories of main causes	Mean score
1	Management system	6.56
2	Staffing	5.22
3	Technical	4.29

8.4.2 Frequency of occurrence

Figure 8.2 shows the mean score assigned by the respondents for the causes' frequency of occurrence in the local building projects in a descending order of priority.

Thirteen out of the 16 causes selected for the questionnaire survey were considered as frequently occurring causes leading to site coordination problems in building projects as their mean scores were above five.

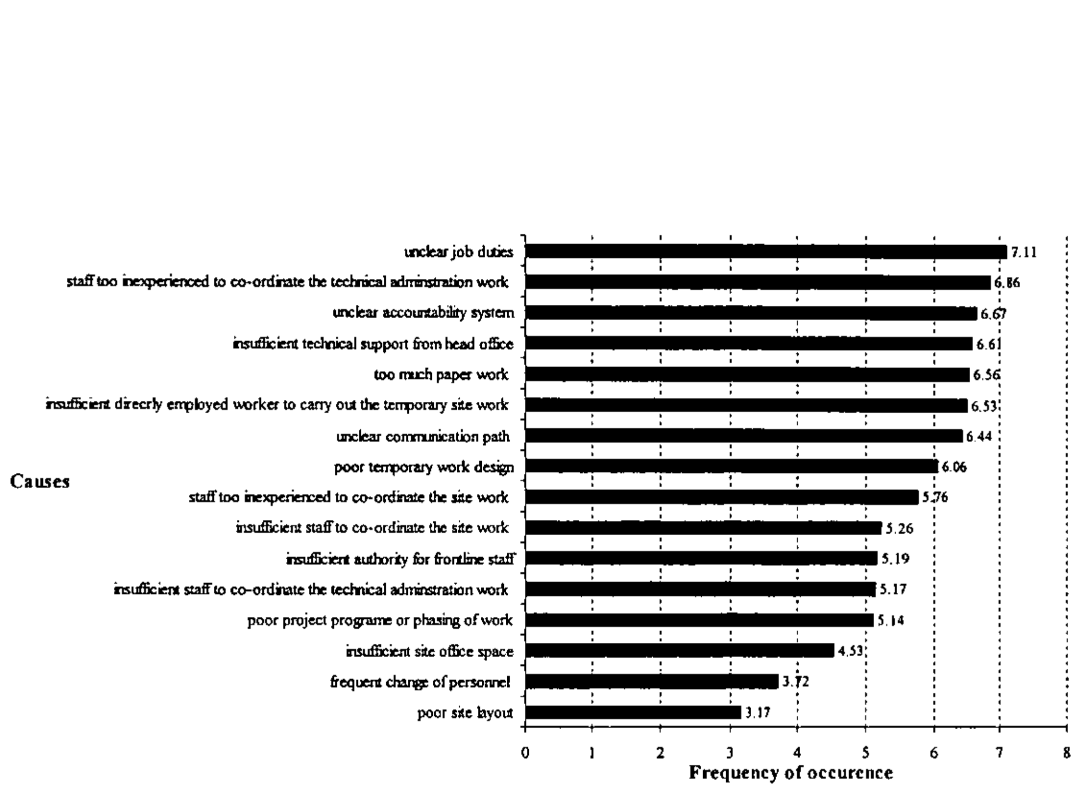

Figure 8.2: Mean score for frequency of occurrence

Project organisation is a dynamic temporarily multi-organisation system that is created during a project development process. *Unclear job duties* was found to be the most frequent cause and its mean score is well above the other causes. Performance of construction project manager was the single most critical factor affecting successful project outcomes (Hartman, 2000; Bandow and Summer, 2001). Unfortunately, local project managers tend to assign inexperienced staff to handle the technical administration work. There is little difference in the mean scores of the third to the seventh most frequent causes. Three out of four least frequent causes are technical related causes.

Table 8.3 summarises the mean scores for frequency of occurrence of the categories of main causes to main contractor's site coordination problems. The mean scores for all three categories are above five.

Table 8.3: Mean score for frequency of occurrence

Rank	Categories of main causes	Mean score
1	Management system	6.39
2	Staffing	5.55
3	Technical	5.10

8.4.3 Aggregated importance score

Aggregated importance score for each cause is taken as the combined score of the degree of contribution and the frequency of occurrence. Figure 8.3 summarises the aggregated importance scores in a descending order of priority.

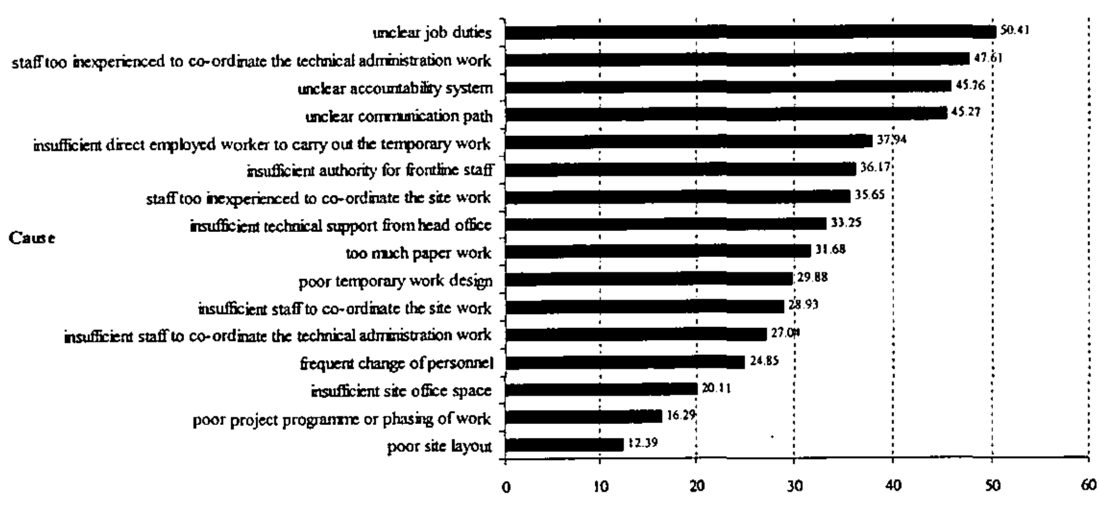

Figure 8.3: Aggregated importance score for causes to site coordination problems

As a nine-point scoring system was adopted for both the contribution and frequency variable for this study, causes with aggregate importance score above 25 were considered as the essential cause of site coordination problems in the HK building projects. Twelve out of 16 causes selected for the survey were considered as the essential causes as their scores are above 25. *Unclear job duties* was the most main cause of site coordination problems and its score is well above the others. Three out of the four highest scores causes are management system related causes. The three causes with the lowest scores are technical related causes.

Table 8.4: Aggregate importance score for the three main types of causes

Rank	Categories of main causes	Mean score
1	Management system	41.85
2	Staffing	33.64
3	Technical	22.37

Table 8.4 summarises the mean aggregate importance scores for the categories of main causes of main contractor's site coordination problems. The mean scores for management system related causes and staffing related causes are above 25. Even though the mean frequency score for technical is above five, its mean aggregate importance score is still below 25 because this category of cause has low mean contribution score.

8.5 Summary

Sixteen main contractor related causes that lead to ineffective and inefficient site coordination on HK building projects were identified from literature and advice from experienced industrial practitioners. These were classified into: *staffing related causes;*

technical related causes; and *management system related causes.* The results of the questionnaire survey show that:

- eleven causes made a significant contribution to main contractors' site coordination problems
- thirteen causes were identified as frequently occurring causes;
- twelve out of the initial 16 causes selected for the survey were considered as the essential causes based on their importance scores being above 25;
- *unclear job duties* was found to be the most important and the most frequent cause of site coordination problems: and
- the mean aggregated importance score of *management system related causes* was well above *technical related causes* and *staffing related causes.*

This chapter has identified twelve essential causes that contributed to the critical site coordination problems. Time, cost and quality are the three fundamental criteria used to assess the subcontract performance. A study to formulate the relationships among the identified essential causes, critical site coordination problems and the three project outcomes was conducted and has been presented in the following chapters.

CHAPTER NINE

FORECASTING THE PERFORMANCE OF SUBCONTRACTORS

9.1 Introduction

The aim of this chapter is to explain the data analysis used to formulate the relationships that explain the outcomes of subcontracts in building projects based on the frequency of occurrence of the six critical site coordination problems as identified in the Chapter Seven. A questionnaire survey was conducted to achieve the purpose.

9.2 Research methodology

Data collected from Section C and Section D of the questionnaire, attached as Appendix A, were used for this stage of work. In Section C, respondents were requested to assign a score from 10 (represent 100% achievement) to 0 (represent 0% achievement) with a 0.5 interval to represent their views on the level of achievements in time performance, cost performance and quality performance of their firms in their current projects. In Section D, respondents were requested to assign a score from (10 occurred in every site operation) to 0 (never occurred in site operation) with a 0.5 interval to show the frequency of occurrence of the site coordination problems caused by main contractors in their current projects.

A descriptive statistic summary of the data is presented as a preliminary analysis of the data. Multiple regression analysis and neural network analysis were adopted to establish the forecasting models. The data analysis is divided into three main areas: the impact of site coordination problems to time performance, cost performance and quality performance of different types of subcontractors. For each forecasting model, stepwise and backward elimination multiple regression procedures were used to formulate the standard form regression equation that includes all the six critical site coordination problems and simple form regression equation that only includes the 'most critical' problems. NeuroShell2, a popular neural network analysis software, was used to generate the predicted project outcomes of the observed data. The correlation coefficients of the neural network outputs and the multiples regression questions are compared. Explanations to the findings of the analysis are presented as the conclusion of this chapter. The SPSS regression printouts and the neural network analysis outputs for this chapter are attached as Appendix M and Appendix N respectively.

9.3 Coding system

The coding systems summarized in Table 9.1 and Table 9.2 are adopted to simplify the description of the repeated terms and enhance the understanding of the flow of the data analysis work in this chapter.

Table 9.1: Overall coding system

Code	Item
SP	Site coordination problem
All	All type of subcontractors
Fin	Finishing work subcontractors
Str	Structural work subcontractors
BS	Building services work subcontractors

Table 9.2: Coding system for site coordination problems

Code	Site coordination problem
SCP1	Short notice to commence site work
SCP2	Late to provide plant support
SCP3	Interfacing work not yet completed
SCP4	Interfacing work not accurately completed
SCP5	Construction information not detail enough
SCP6	Construction information unclear or contradictory

9.4 Descriptive statistic for site coordination problems

9.4.1 Type of respondents

One hundred and seventeen replies were received in the questionnaire survey on the site coordination problems. The respondents were classified into three categories and are shown in Table 9.3 and Figure 9.1. A table list the data of all the replies is attached as Appendix O.

Table 9.3: Type of respondents of the questionnaire survey on site coordination problems

Type of respondents	Number of reply
Finishing work subcontractors	43
Building services work subcontractors	40
Structural work subcontractors	34
Total	117

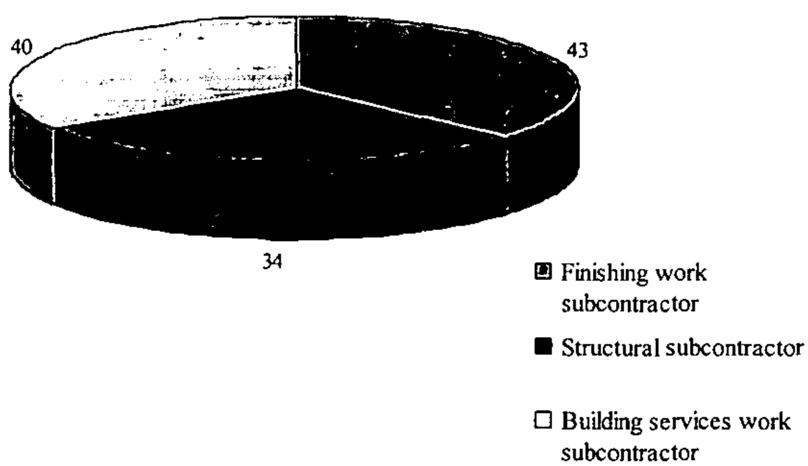

Figure 9.1: Distribution of the replies of site coordination problems survey

9.4.2 Descriptive statistics for all replies

Table 9.4 summarizes the descriptive statistics for the achievements in the three project outcomes in the current projects of the respondents in a descending order of priority. The mean scores of all the project outcomes are around 7. This shows that most of the respondents were able to achieve 70 per cent of their target standards in time performance, cost performance and quality performance in their projects. The mean score for quality performance is the highest among the three outcomes. The mean scores for time performance and cost performance are almost the same. The lowest score for cost performance is 3 which is high under the 10-point rating system. The standard deviations for the three outcomes are not high and thus most of the scores concentrated around 5.5 to 8.5. Around 10 per cent of the respondents claimed that their projects could fully achieve the planned targets.

Table 9.4: Descriptive statistics for project outcomes achievements

Project outcome	Mean score for achievement in project outcome	Standard deviation	Maximum score	Minimum score
Quality	7.303	1.259	10.0	2.0
Cost	6.956	1.299	10.0	3.0
Time	6.940	1.579	10.0	1.0

The descriptive statistics for the frequency of occurrence of site coordination problems assigned by the respondents has been summarized in a descending order of priority in Table 9.5. Three out the six critical site coordination problems selected for this survey can be considered as frequently occurring problems in projects as their scores are over 5. SCP4 has the highest score and it is about 1.55 above the lowest score problem, SCP2. The standard deviations of the six site coordination problems are quite consistent and they are around 1.34 to 1.51.

Table 9.5: Descriptive statistics for site coordination problems

Site coordination problems	Mean score for frequency of occurrence	Standard deviation	Maximum score	Minimum score
SCP4	5.949	1.404	9.5	2.0
SCP6	5.551	1.377	8.5	1.5
SCP5	5.064	1.344	9.0	2.0
SCP1	4.927	1.419	9.0	1.0
SCP3	4.808	1.514	9.0	1.0
SCP2	4.402	1.425	8.5	1.0

a. Comparison between the finishing work subcontractors and the overall data

Table 9.6 compares the data of the finishing work subcontractors with the overall data. SCP1, SCP4, SCP5 and SCP6 are less frequently occurred in finishing work as their mean scores are lower than the overall data. The total score of the six site coordination problems are 0.34 lower than the overall data. This shows that less site coordination problems would occur in the finishing work in general. However, the time performance and cost performance of finishing work subcontractors are still below the overall data. Only the quality performance is almost the same as the overall data.

Table 9.6: Comparison between finishing work subcontractors and the overall data

Outcome/Variable	A	B	C
Time	6.674	6.940	-0.266
Cost	6.744	6.956	-0.212
Quality	7.302	7.303	-0.001
SCP4	5.884	5.949	-0.065
SCP6	5.302	5.551	-0.249
SCP3	5.035	4.808	0.227
SCP5	4.872	5.064	-0.192
SCP1	4.849	4.927	-0.078
SCP2	4.419	4.402	0.017

A: Mean score for achievement in project outcome or mean score for frequency of occurrence of the site coordination problems of finishing work subcontractors.

B: Mean score for achievement in project outcome or mean score for frequency of occurrence of the site coordination problems of the overall data.

C: Difference of A and B.

b. Comparison between structural work subcontractors and the overall data

The comparison between the data of the structural work subcontractors and the overall data is shown in Table 9.7. Four out of the six site coordination problems in structural work subcontractors have lower mean scores than the overall data. However, the total score of all the six site coordination problems are still 0.005 higher than the overall data.

This is because the increases in mean scores of SCP5 and SCP2 have compensated the total decreases in other four problems. This shows that these two site coordination problems would happen frequently in structural work. This may be because the structural work demands more plant support than the finishing work and building services work. Also, most of the structural work cannot be carried out without sufficient information while some of the finishing work and building services work can still be proceed based on the common trade practices if there are problems related to construction information. Although there is a slightly increase in total score of the frequency of occurrence of site coordination problems, structural work subcontractors still have better performance in time and cost than the overall data.

Table 9.7: Comparison between structural work subcontractors and the overall data

Outcomes/Variables	A	B	C
Time	7.221	6.940	0.281
Cost	7.335	6.956	0.379
Quality	7.353	7.303	0.050
SCP4	5.838	5.949	-0.111
SCP6	5.412	5.551	-0.139
SCP5	5.412	5.064	0.318
SCP1	4.779	4.927	-0.148
SCP3	4.662	4.808	-0.146
SCP2	4.603	4.402	0.201

A: Mean score for achievement in project outcome or mean score for frequency of occurrence of the site coordination problems of structural work subcontractors.

B: Mean score for achievement in project outcome or mean score for frequency of occurrence of the site coordination problems of the overall data.

C: Difference of A and B.

c. Comparison between building services work subcontractors and the overall data

The data of building services work subcontractors and the overall data have been compared in Table 9.8. More site coordination problems would be occurred in the building services work as its total score of all problems is 0.364 higher than the overall data. This is mainly due to increases in mean scores in SCP1 and SCP6. Building services work involves a lot of complicate coordination work among the different services systems especially the ceiling voids of the local high-rise buildings are always small. *Unclear or contradictory construction information occurred frequently* is thus expected by the building services subcontractors because main contractor are always unable to well plan the work well ahead. However, there is no significant impact on the performance of the building services subcontractors as the mean scores for the achievement of the three project outcome are about the same of the overall data. This shows that most of the site coordination problems can be resolved on site based on subcontractors' experience.

Table 9.8: Comparison between building services work subcontractors and the overall data

Outcomes/Variables	A	B	C
Time	6.988	6.940	0.048
Cost	6.863	6.956	-0.093
Quality	7.262	7.303	-0.041
SCP4	6.113	5.949	0.164
SCP6	5.938	5.551	0.387
SCP1	5.138	4.927	0.211
SCP5	4.975	5.064	-0.089
SCP3	4.688	4.808	-0.120
SCP2	4.213	4.402	-0.189

A: Mean score for achievement in project outcome or mean score for frequency of occurrence of the site coordination problems of building services work subcontractors.

B: Mean score for achievement in project outcome or mean score for frequency of occurrence of the site coordination problems of the overall data.

C: Difference of A and B.

d. Summary of the descriptive statistics

Table 9.9 shows the mean scores for the achievements in project outcomes of different type of subcontractors in a descending order of priority. The two highest project outcomes achievement scores are from the structural work subcontractors and the two lowest project outcomes achievement scores are from the finishing work subcontractors.

Table 9.9: Mean score for achievements in project outcomes

Project outcome	Type of subcontractor	Mean score for achievement in project outcome
Quality	Structural work subcontractor	7.353
Cost	Structural work subcontractor	7.335
Quality	All types	7.303
Quality	Finishing work subcontractor	7.302
Quality	Building services work subcontractor	7.262
Time	Structural work subcontractor	7.221
Time	Building services work subcontractor	6.988
Cost	All types	6.956
Time	All types	6.940
Cost	Building services work subcontractor	6.863
Cost	Finishing work subcontractor	6.744
Time	Finishing work subcontractor	6.674

Table 9.10 shows the total mean score for the frequency of occurrence of the six site coordination problems for different type of subcontractors in a descending order of priority. The table shows that there is no significant difference in the amount of site coordination problems faced by the three types of subcontractors. It is therefore assumed

that there is no significant difference in the perception of site coordination problems amongst the three types of subcontractors.

Table 9.10: Total mean score for the six critical site coordination problems

Type of subcontractor	Total mean score for the six coordination problems
Building services work subcontractor	31.065
Structural work subcontractor	30.706
Finishing work subcontractor	30.361
All types	30.701

9.5 Type of models analyzed

9.5.1 Main models and sub-models

The project outcomes (i.e. time, cost and quality) are the dependent variables and the six site coordination problems are the independent variables of the regression equations. In this analysis, three main models to assess the impact of the site coordination problems to each of the project outcomes were formulated. Other than the main model, three sub-models for the each type of subcontractors for each main model were also produced. As a result, three main models and nine sub-models were established in the analysis and are summarized in Table 9.11.

Table 9.11: Models generated to assess the impact of site coordination problems

Model code	Dependent variable	Type of model	Type of data used for the analysis
SP-Time-All	Time	Main model	All type of subcontractors
SP-Time-Fin	Time	Sub-model	Finishing work subcontractors
SP-Time-Str	Time	Sub-model	Structural work subcontractors
SP-Time-BS	Time	Sub-model	Building services work subcontractors
SP-Cost-All	Cost	Main model	All type of subcontractors
SP-Cost-Fin	Cost	Sub-model	Finishing work subcontractors
SP-Cost -Str	Cost	Sub-model	Structural work subcontractors
SP-Cost -BS	Cost	Sub-model	Building services work subcontractors
SP-Quality-All	Quality	Main model	All type of subcontractors
SP-Quality -Fin	Quality	Sub-model	Finishing work subcontractors
SP-Quality -Str	Quality	Sub-model	Structural work subcontractors
SP-Quality -BS	Quality	Sub-model	Building services work subcontractors

9.5.2 Standard form and simple form of regression equations

The regression equations of the models comprise six independent variables. In fact, some of the variables of the equations can be eliminated without having significant impact to the accuracy of the regression equations. The backward elimination method was adopted to reduce the number of computations. The variable was eliminated if probability of F-to-remove was equal or greater than 0.100. In each stage of elimination process, the most insignificant independent variable was removed. The process would be terminated until no variable satisfied the elimination condition. For ease of reference in the data analysis, the regression equation containing all the six variables is named as standard form regression equation. The last stage regression equation generated in the elimination process is named as simple form regression equation. The simple form regression equation can able the main contractors to focus their efforts on monitoring the 'most critical' site coordination problems. As a cross check on how well the regression equations fit the data, the data were also processed by a neural network software called NeuroShell 2. In each model, two sets of neural network outputs were produced for the analysis that included all six independent variables of standard form regression equation and just the independent variables of the simple form regression equation respectively. Table 9.12 list the regression equation codes for different models.

Table 9.12: Regression equation code for site coordination problems analysis

Regression equation code	Form of regression equation
SP-Time-All-1	Standard form
SP-Time-All-final	Simple form
SP-Time-Fin-1	Standard form
SP-Time-Fin-final	Simple form
SP-Time-Str-1	Standard form
SP-Time-Str-final	Simple form
SP-Time-BS-1	Standard form
SP-Time-BS-final	Simple form
SP-Cost-All-1	Standard form
SP-Cost-All-final	Simple form
SP-Cost-Fin-1	Standard form
SP-Cost-Fin-final	Simple form
SP-Cost –Str-1	Standard form
SP-Cost –Str-final	Simple form
SP-Cost –BS-1	Standard form
SP-Cost –BS-final	Simple form
SP-Quality-All-1	Standard form
SP-Quality-All-final	Simple form
SP-Quality –Fin-1	Standard form
SP-Quality –Fin-final	Simple form
SP-Quality –Str-1	Standard form
SP-Quality –Str-final	Simple form
SP-Quality –BS-1	Standard form
SP-Quality –BS-final	Simple form

9.6 Time performance analysis

9.6.1 Analysis for all types of subcontractors (SP-Time-All)

a. Outliers and descriptive statistics for SP-Time-All model

A preliminary data analysis exercise was conducted to detect the extreme case using Mahalanobis statistical method. Two outlier cases were found and deleted from the data pool in order to achieve a more accurate result. One hundred and fifteen cases were included in the multiple regression analysis. Table 9.13 provides the descriptive statistics for the SP-Time-All model in the descending order of priority of the mean scores of the site coordination problems.

Table 9.13: Descriptive statistics for SP-Time-All model

Variables	*Mean	Standard deviation
Time	6.948	1.522
SCP4	5.961	1.382
SCP6	5.548	1.370
SCP5	5.070	1.323
SCP1	4.935	1.392
SCP3	4.796	1.488
SCP2	4.400	1.399

*Mean: mean score for achievement of time performance or mean score for frequency of occurrence of site coordination problems respectively.

b. Examining the variables of SP-Time-All model

The scatterplot matrix shown in Appendix P provides the preliminary visual examination on the relationship between time performance of the subcontractors and each of the six critical site coordination problems. The scatterplot shows that all the site coordination problems are fairly linearly related to time performance. Thus it is not necessary to transform the data by taking log or square root of any of the independent variables.

c. Testing hypothesis for SP-Time-All model

The F-statistics for the regression with all the six site coordination problems is 24.923 and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is thus rejected. There is at least one of the coefficients is not 0.

d. The correlation coefficients of SP-Time-All model

Pearson correlation coefficient (r) describes how well the model fits the data. Table 9.14 summarizes the Pearson correlation coefficient (r) of the six site coordination problems in a descending order of priority of their absolute values. All the correlation coefficients are of negative values because the time performance achievement of the subcontractors would be deteriorated with the increase of the site coordination problems. Four out of the six site coordination problems have good correlation with time performance as their absolute scores are above 0.5.

Table 9.14: Correlation coefficient of SP-Time-All model

Variables	Pearson correlation coefficient (r)
SCP3	-0.666
SCP2	-0.650
SCP1	-0.627
SCP4	-0.560
SCP6	-0.411
SCP5	-0.392

e. Selecting variables for SP-Time-All model

Four stage equations were computed in the analysis using backward elimination method. SCP1, SCP2 and SCP3 were kept in the SP-Time-All-final regression equation. Table 9.15 lists the regression equations in each step of elimination process. The SP-Time-All-final equation shows that subcontractors' time performance mainly depends on the occurrence of *short notice to commence site work (SCP1), late to provide plant support (SCP2)* and *interfacing work by other subcontractor not yet completed (SCP3).*

Table 9.15: Regression equations of SP-Time-All model

Model	Regression equations
SP-Time-All-1	Time = 11.645 - 0.229xSCP1 - 0.343xSCP2 - 0.314xSCP3 -0.031xSCP4 + 0.001xSCP5 - 0.068xSCP6
SP-Time-All-2	Time = 11.647 - 0.229xSCP1 - 0.342xSCP2 - 0.314xSCP3 - 0.031xSCP4 - 0.068xSCP6
SP-Time-All-3	Time = 11.594 - 0.239xSCP1 - 0.354xSCP2 - 0.315xSCP3 - 0.071xSCP6
SP-Time-All-final	Time = 11.384 - 0.259xSCP1 - 0.368xSCP2 - 0.320xSCP3

f. Explaining the variability of SP-Time-All model

R Square, the square of the correlation coefficient, describes what proportion of the variability of the dependent variable is explained by the regression equation. Adjusted R Square can estimate how well the equation fits another set of data from the same population. Table 9.16 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values for the four stage regression equations. All the four stage regression equations are closely related to time performance as their R values are over 0.7. The R values for first two stage regression equations are the same. SCP5 and SCP4 are thus not too critical to the subcontractors' time performance.

Table 9.16: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Time-All model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Time-All-1		0.762	0.581	0.577	24.923	0.000
SP-Time-All-2	SCP5	0.762	0.581	0.561	30.184	0.000
SP-Time-All-3	SCP4	0.762	0.580	0.565	38.022	0.000
SP-Time-All-final	SCP6	0.760	0.577	0.566	50.507	0.000

9.6.2 Analysis for finishing work subcontractors (SP-Time-Fin)

a. The correlation coefficient of SP-Time-Fin model

Forty-three out of the 117 respondents were worked in the finishing work subcontractors. Table 9.17 shows the Pearson correlation coefficient (r) of the six site coordination problems of SP-Time-Fin model in a descending order of priority of their absolute values and the comparison with the values of SP-Time-All model. The site problems are strongly related to time performance in the finishing work subcontracts as all their absolute r coefficients are above 0.5. SCP2, SCP4 and SCP1 are very strongly related to time performance as their absolute values are over 0.75. Compared with the SP-Time-All model, all the variables of SP-Time-Fin model have higher absolute value. This indicates that the site coordination problems of the finishing work subcontractors are more linearly correlated to time performance.

Table 9.17: Correlation coefficients of SP-Time-Fin model and comparison with SP-Time-All model

Variables	A	B	C
SCP2	-0.823	-0.650	0.173
SCP4	-0.781	-0.560	0.221
SCP1	-0.763	-0.627	0.136
SCP3	-0.683	-0.666	0.017
SCP6	-0.648	-0.411	0.237
SCP5	-0.529	-0.392	0.137

A: Pearson correlation coefficient (r) of SP-Time-Fin model.

B: Pearson correlation coefficient (r) of SP-Time-All model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for SP-Time-Fin model

Table 9.18 lists the four regression equations generated in the analysis. SCP2, SCP4 and SCP6 were remained in the SP-Time-Fin-final regression equation. The SP-Time-All-final equation also consists of three independent variables. However, only SCP2 is common in both of the SP-Time-All-final equation and SP-Time-Fin-final equation. The regression SP-Time-Fin-final equation shows that time performance of finishing work subcontractors depends mainly on three site coordination problems: *late to provide plant support (SCP2), interfacing work not accurately completed (SCP4)* and *construction information unclear or contradictory (SCP6).*

Table 9.18: Regression equations of SP-Time-Fin model

Model	Regression equations
SP-Time-Fin-1	Time = 13.896 - 0.265xSCP1 - 0.429xSCP2 - 0.094x SCP3 - 0.300x SCP4 – 0.158xSCP5 - 0.194xSCP6
SP-Time-Fin-2	Time = 13.794 - 0.293xSCP1 - 0.466x SCP2 - 0.280xSCP4 - 0.166x SCP5 - 0.223xSCP6
SP-Time-Fin-3	Time = 13.456 - 0.256x SCP1 - 0.530x SCP2 - 0.290x SCP4 - 0.282xSCP6
SP-Time-Fin-final	Time = 13.375 – 0.607x SCP2 – 0.384xSCP4 – 0.333xSCP6

c. Explaining the variability of SP-Time-Fin model

Table 9.19 summarizes the R, R Square and Adjusted R Square values for the four stage regression equations for SP-Time-Fin model. The four stage equations are very strongly related to time performance as their R values are around 0.9. SP-Time-Fin-final equation is more strongly related to time performance than SP-Time-All-final equation as its R value is 0.130 higher.

Table 9.19: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Time-Fin model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Time-Fin-1		0.906	0.821	0.791	28.486	0.000
SP-Time-Fin-2	SCP3	0.905	0.818	0.794	34.488	0.000
SP-Time-Fin-3	SCP5	0.898	0.806	0.786	43.445	0.000
SP-Time-Fin-final	SCP1	0.890	0.792	0.776	57.638	0.000

9.6.3 Analysis for structural work subcontractors (SP-Time-Str)

a. The correlation coefficient of SP-Time-Str model

Thirty-four out of the 117 replies were from the structural work subcontractors. Table 9.20 summarizes the Pearson correlation coefficient (r) of the six site coordination problems in a descending order of their absolute value for SP-Time-Str model and the comparison with the values of SP-Time-All model.

Table 9.20: Correlation coefficients of SP-Time-Str model and comparison with SP-Time-All model

Variables	A	B	C
SCP3	-0.742	-0.666	0.076
SCP2	-0.724	-0.650	0.074
SCP1	-0.692	-0.627	0.065
SCP4	-0.532	-0.560	-0.028
SCP5	-0.409	-0.392	0.017
SCP6	-0.346	-0.411	-0.065

A: Pearson correlation coefficient (r) of SP-Time-Str model.

B: Pearson correlation coefficient (r) of SP-Time-All model.

C: Difference of absolute value of A and absolute value of B.

There is only a slightly difference in the absolute value of the six variables and has no change in the order of priority of the variables in these two models. Four variables have absolute r coefficients above 0.5.

b. Selecting variables for SP-Time-Str model

Table 9.21 summarizes the regression equations in each stage of backward elimination analysis for SP-Time-Str model. Four stage regression equations were formulated in the analysis. The SP-Time-Str-final equation consists of SCP1, SCP2 and SCP3 which are the same of SP-Time-All-final equation. The SP-Time-Str-final indicates that time performance of the structural subcontractors depends mainly on three site coordination problem: *short notice to commence site work (SCP1), late to provide plant support (SCP2)* and *interfacing work by other subcontractor not yet completed (SCP3).*

Table 9.21: Regression equations of SP-Time-Str model

Model	Regression equations
SP-Time-Str-1	Time = 12.299 - 0.350xSCP1 - 0.421xSCP2 - 0.420x SCP3 + 0.117x SCP4 + 0.119xSCP5 - 0.155xSCP6
SP-Time-Str-2	Time = 12.542 - 0.314xSCP1 - 0.403x SCP2 - 0.422xSCP3 + 0.127x SCP4 - 0.137xSCP6
SP-Time-Str-3	Time = 12.658 - 0.285x SCP1 - 0.352x SCP2 - 0.393x SCP3 - 0.114xSCP6
SP-Time-Str-final	Time = 12.227 - 0.271x SCP1- 0.407xSCP2 - 0.394xSCP3

c. **Explaining the variability for SP-Time-Str model**

Table 9.22 summarizes the R, R square, Adjusted R Square, F-statistics and Significance Level values of the four regression stage equations for SP-Time-Str model. The four stage equations are very strongly related to time performance as their R values are above 0.8. The change in R values is consistent in each of elimination process. SCP4, SCP5 and SCP6 thus have similar amount of influence on the time performance of the structural work subcontractors. Time-Str-final equation is slightly stronger related to time performance than of SP-Time-All-final equation as its R value is only 0.071 higher.

Table 9.22: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Time-Str model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Time-Str-1		0.844	0.712	0.648	11.103	0.000
SP-Time-Str-2	SCP 5	0.840	0.706	0.654	13.454	0.000
SP-Time-Str-3	SCP 4	0.836	0.698	0.657	16.773	0.000
SP-Time-Str-Final	SCP 6	0.831	0.697	0.660	22.320	0.000

9.6.4 Analysis for building services work subcontractors (SP-Time-BS)

a. **The correlation coefficients of SP-Time-BS model**

Forty out of the 117 replies were from the building services work subcontractors. Table 9.23 summarizes the Pearson correlation coefficient (r) for the six site coordination problems in a descending order of priority of their absolute values of the SP-Time-BS model and the comparison with the values of SP-Time-All model. In the building services work, only SCP3 is strongly related to time performance as its absolute r coefficient is above 0.7. Four out of six variables have the absolute r coefficients lower than 0.5. Compared with the SP-Time-All model, four variables have higher absolute r coefficients.

Table 9.23: Correlation coefficients of SP-Time-BS model and comparison with SP-Time-All model

Variables	A	B	C
SCP3	-0.711	-0.666	0.045
SCP1	-0.513	-0.627	-0.114
SCP2	-0.418	-0.650	-0.232
SCP5	-0.394	-0.392	0.002
SCP4	-0.371	-0.560	-0.189
SCP6	-0.258	-0.411	-0.153

A: Pearson correlation coefficient (r) of SP-Time-BS model.

B: Pearson correlation coefficient (r) of SP-Time-All model.

C: Difference of absolute value of A- absolute value of B.

b. Selecting variables for SP-Time-BS model

Table 9.24 lists the regression equations in each step of elimination process for SP-Time-BS model. Six stage equations were established in the analysis. The SP-Time-BS-final equation only has one independent variable, SCP3. This result matches the high absolute r coefficient of SCP3. The SP-Time-BS-final regression equation is very simple consisting of one independent variable only. It shows that the time performance of the building services work subcontractors depends heavily the occurrence of *incomplete interfacing work (SCP3).*

Table 9.24: Regression equations of SP-Time-BS model

Model	Regression equations
SP-Time-BS	Time = 8.906 - 0.075xSCP1 - 0.120xSCP2 - 0.498x SCP3 + 0.191x SCP4 - 0.047xSCP5 + 0.062xSCP6
SP-Time-BS-1	Time = 8.907 - 0.057xSCP1 - 0.108x SCP2 - 0.514xSCP3 + 0.160x SCP4 + 0.046xSCP6
SP-Time-BS-3	Time = 8.922 - 0.098x SCP2 - 0.540xSCP3 + 0.137x SCP4 + 0.029xSCP6
SP-Time-BS-4	Time = 9.018 - 0.090x SCP2 - 0.536SCP3 + 0.141x SCP4
SP-Time-BS-5	Time = 8.996 - 0.554SCP3 + 0.097x SCP4
SP-Time-BS-final	Time = 9.361 - 0.506SCP3

c. Explaining the variability of SP-Time-BS model

Table 9.25 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values for the six stage regression equations for SP-Time-BS model. The R values for all the six stage regression equations are above 7 and this shows that they are all strongly related to the time performance. R values of the SP-Time-BS-1 equation and SP-Time-BS-2 equation are the same. SCP5 thus has no significant impact to the time performance of the structural subcontractors. The different between the SP-Time-BS-1 and SP-Time-BS-final is only 0.011. This indicates that SCP3 is dominant in the time performance analysis. SP-Time-BS-final equation is not as accurate as SP-Time-All-final equation in explain the time performance for structural subcontractors as its R value is 0.049 lower.

Table 9.25: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Time-BS model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Time-BS-1		0.722	0.522	0.435	5.998	0.000
SP-Time-BS-2	SCP5	0.722	0.521	0.450	7.392	0.000
SP-Time-BS-3	SCP1	0.721	0.519	0.464	9.451	0.000
SP-Time-BS-4	SCP6	0.720	0.518	0.478	12.920	0.000
SP-Time-BS-5	SCP2	0.716	0.513	0.487	19.487	0.000
SP-Time-BS-final	SCP4	0.711	0.506	0.493	38.859	0.000

9.6.5 Neural network analysis for time performance

Table 9.26 summarises the neural network analysis results in time performance for the different models in the descending order of priority of their correlation coefficients.

Table 9.26: Neural network analysis for time performance

Neural network output	A	B	C	D
SP-Time-Fin-1	0.905	10	43	0.0035768
SP-Time-Fin-final	0.900	8	43	0.0067964
SP-Time-Str-1	0.832	9	34	0.0007867
SP-Time-Str-final	0.873	8	34	0.0008179
SP-Time-All-1	0.763	14	117	0.0006010
SP-Time-All-final	0.763	12	117	0.0006462
SP-Time-BS-1	0.706	10	40	0.0000577
SP-Time-BS-final	0.772	7	40	0.0000046

A: Correlation coefficient.

B: Number of hidden neurons.

C: Number of patterns processed.

D: Minimum error when the training was stopped.

All the models computed by NeuroShell 2 software fit the data very well as their correlation coefficients are all over 0.7. The outputs of SP-Time-Fin model have the highest r coefficients which are over 0.9.

9.6.6 Summary for time performance analysis

Table 9.27 compares the correlation coefficients of the regression equations and the neural network analysis outputs. The correlation coefficients computed by these two methods are quite consistent for all the models and the maximum differences is only 0.061. As all the regression equations have high correlation coefficients, they are quite reliable to explain the relationship between subcontractors' time performance and the occurrence of the site coordination problems. Among the six coordination problems, *late to provide plant support* (SCP2) and *interfacing work not yet completed* (SCP3) are most critical to the time performance as they appear in three out of the four simple form regression equations.

Table 9.27: Comparison of multiple regression method and neural network method for time performance

Model	A	B	C	D
SP-Time-Fin-1	All	0.906	0.905	0.001
SP-Time-Fin-final	SCP2, SCP4, SCP6	0.890	0.900	-0.010
SP-Time-Str-1	All	0.844	0.832	0.012
SP-Time-Str-final	SCP1, SCP2, SCP3	0.831	0.874	-0.043
SP-Time-All-1	All	0.762	0.763	-0.001
SP-Time-All-final	SCP1, SCP2, SCP3	0.760	0.763	-0.003
SP-Time-BS-1	All	0.722	0.706	0.016
SP-Time-BS-Final	SCP3	0.711	0.772	-0.061

A: Independent variables included in the model.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network method.

D: Difference of B and C.

9.7 Cost performance analysis

9.7.1 Analysis for all types of subcontractors (SP-Cost-All)

a. Outliers and descriptive statistics for SP-Cost-All model

One extreme case was detected by adopting Mahalanobis method. As a result, one hundred and sixteen cases were included in the multiple regression analysis after deleting the outlier. Table 9.28 provides the descriptive statistics for the SP-Cost-All model in a descending order priority of mean score of the site coordination problems.

Table 9.28: Descriptive statistics for SP-Cost-All model

Variables	*Mean	Standard deviation
Time	6.947	1.301
SCP4	5.935	1.403
SCP6	5.543	1.381
SCP5	5.060	1.350
SCP1	4.927	1.425
SCP3	4.819	1.516
SCP2	4.392	1.428

*Mean: mean score for achievement of time performance or mean score for frequency of occurrence of site coordination problems respectively.

b. Examining the variables of SP-Cost-All model

The scatterplot matrix shown in Appendix P shows that all the site coordination problems are fairly linearly related to cost performance. Data transformation such as log or square root is not necessary.

c. Testing hypothesis for SP-Cost-All model

The F-statistics of the multiple regression analysis including all the six site coordination problems is 6.260. The value is not high but the observed significance level is 0.000.

Thus the hypothesis that $b_k = 0$ can still be rejected and it can be concluded that there is at least one of the coefficients is not 0.

d. The correlation coefficients of SP-Cost-All model

The Pearson correlation coefficients (r) of the six site coordination problems are summarized in Table 9.29 in a descending order of priority of their absolute values. All the r coefficients are of negative values because the achievement in cost performance would be decreased with the increase of occurrence of the site coordination problems. The model does not well fit with the data as the r coefficients all the site coordination problems are below 0.5. SCP3 has the highest absolute value while SCP5 has the lowest absolute value.

Table 9.29: Correlation coefficient of SP-Cost-All model

Variables	Pearson correlation coefficient (r)
SCP3	-0.471
SCP4	-0.398
SCP1	-0.373
SCP2	-0.367
SCP6	-0.294
SCP5	-0.223

d. Selecting variables for SP-Cost-All model

Five stage regression equations were computed in the backward elimination analysis. Four independent variables were removed from the standard equation and the SP-Cost-

All-final equation consists of SCP3 and SCP4. Table 9.30 summarizes the regression equations in each step of elimination process. The SP-Cost-All-final equation shows that time performance of the subcontractors mainly depends on the occurrence two site coordination problems: *interfacing work by other subcontractor not yet completed (SCP3)* and *interfacing work not accurately completed (SCP4).* Both of these problems relates to the interfacing works by other subcontractors of the project. One possible explanation for this finding is that interfacing works are very complicate and difficult to complete to the satisfactions of the concerned subcontractors on time.

Table 9.30: Regression equations of SP-Cost-All model

Model	Regression equations
SP-Cost-All-1	Cost = 9.522 + 0.015xSCP1 - 0.040xSCP2 - 0.308xSCP3 -0.162xSCP4 + 0.084xSCP5 - 0.087xSCP6
SP-Cost-All-2	Cost = 9.555 - 0.039xSCP2 - 0.302xSCP3 - 0.157xSCP4 + 0.083xSCP5 - 0.085xSCP6
SP-Cost-All-3	Cost = 9.568 - 0.313xSCP3 - 0.173xSCP4 + 0.079xSCP5 - 0.087xSCP6
SP-Cost-All-4	Cost = 9.680 - 0.297xSCP3 - 0.152xSCP4 - 0.072xSCP6
SP-Cost-All-final	Cost = 9.490 - 0.311xSCP3 - 0.176xSCP4

e. Explaining the variability of SP-Cost-All model

Table 9.31 summarizes the R, R Square and Adjusted R Square values of the five SP-Cost-All model stage regression equations. The stages regression equations are only fairly explain the variability of the cost performance as their R values are round 0.5. The R values of the first two stage regressions are the same. SCP1 and SCP2 thus have minimal impact to the cost performance of the subcontractors.

Table 9.31: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Cost-All model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Cost-All-1		0.506	0.256	0.215	6.260	0.000
SP-Cost-All-2	SCP1	0.506	0.256	0.222	7.576	0.000
SP-Cost-All-3	SCP2	0.505	0.255	0.228	9.513	0.000
SP-Cost-All-4	SCP5	0.501	0.251	0.231	12.497	0.000
SP-Cost-All-final	SCP6	0.496	0.246	0.233	18.468	0.000

9.7.2 Analysis for finishing work subcontractors (SP-Cost-Fin)

a. The correlation coefficient of SP-Cost-Fin model

Table 9.32 summarizes the Pearson correlation coefficient (r) of the six site coordination problems in a descending order of priority of their absolute values for SP-Cost-Fin model and the comparison with the value of SP-Cost-All model. The SP-Cost-Fin model can fit the data much better than SP-Cost-All model as five out of the six independent variables have higher absolute r coefficients.

Table 9.32: Correlation coefficients of SP-Cost-Fin model and comparison with SP-Cost-All model

Variables	A	B	C
SCP4	-0.579	-0.398	0.181
SCP1	-0.507	-0.373	0.134
SCP3	-0.454	-0.471	-0.017
SCP2	-0.426	-0.367	0.059
SCP6	-0.357	-0.294	0.063
SCP5	-0.247	-0.223	0.024

A: Pearson correlation coefficient (r) of SP-Cost-Fin model.

B: Pearson correlation coefficient (r) of SP-Cost-All model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for SP-Cost-Fin model

Six stage regression equations were generated in the backward elimination analysis. Table 9.33 lists the regression equations in each step of analysis. Only SCP4 was remained in the SP-Cost-Fin-final equation. The SP-Cost-All-final equation consists of two independent variables and SCP3 are commonly in these two regression equations. The SP-Cost-Fin-final equation shows that the cost performance of the finishing work subcontractors mainly depends on *the accuracy of the interfacing work (SCP4).*

Table 9.33: Regression equations of SP-Cost-Fin model

Model	Regression equations
SP- Cost -Fin-1	Cost = 11.013 - 0.155xSCP1 +.179xSCP2 - 0.277x SCP3 - 0.569xSCP4 – 0.016xSCP5 +0.098xSCP6
SP- Cost -Fin-2	Cost = 10.983 - 0.151xSCP1 +0.174xSCP2 - 0.279xSCP3 - 0.570xSCP4 + 0.092xSCP6
SP- Cost -Fin-3	Cost = 11.071 - 0.135x SCP1 + 0.161x SCP2 - 0.242x SCP3 - 0.538xSCP4
SP- Cost -Fin-4	Cost = 11.054 + 0.137xSCP2 – 0.279xSCP3 – 0.597xSCP4
SP-Cost-Fin-5	Cost = 10.882 – 0.220xSCP3 – 0.515xSCP4
SP- Cost -Fin-final	Cost = 10.478 – 0.635xSCP4

c. Explaining the variability of SP-Cost-Fin model

Table 9.34 summarizes the R, R Square, Adjusted R Square values, F-statistic and Significance Level values of the six stage regression equations for SP-Cost-Fin model.

Table 9.34: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Cost-Fin model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Cost-Fin-1		0.621	0.386	0.283	3.764	0.005
SP-Cost-Fin-2	SCP5	0.621	0.385	0.302	4.639	0.002
SP-Cost-Fin-3	SCP6	0.617	0.381	0.316	5.853	0.001
SP-Cost-Fin-4	SCP1	0.613	0.375	0.327	7.807	0.000
SP-Cost-Fin-5	SCP2	0.606	0.368	0.336	11.629	0.000
SP-Cost-Fin-final	SCP3	0.579	0.335	0.319	20.645	0.000

The R values of the six equations are around 0.6 and higher than that of SP-Cost-All model. The R values of the first two equations are the same. Thus SCP5 are not very critical to cost performance for finishing work subcontractors.

9.7.3 Analysis for structural work subcontractors (SP-Cost-Str)

a. The correlation coefficient for SP-Cost-Str model

Table 9.35 summarizes the Pearson correlation coefficient of the six site coordination problems in a descending order of priority of their absolute values of the SP-Cost-Str model and the comparison with the values of SP-Cost-All model.

Table 9.35: Correlation coefficients of SP-Cost-Str model and comparison with SP-Cost-All model

Variables	A	B	C
SCP2	-0.368	-0.367	0.001
SCP6	-0.218	-0.294	-0.076
SCP3	-0.208	-0.471	-0.263
SCP4	-0.146	-0.398	-0.252
SCP5	-0.101	-0.223	-0.122
SCP1	0.007	-0.373	-0.366

A: Pearson correlation coefficient (r) of SP-Cost-Str model.

B: Pearson correlation coefficient (r) of SP-Cost-All model.

C: Difference of absolute value of A and absolute value of B.

In principle, the increase in site coordination problems would cause the decrease in cost performance. However, only five variables of the SP-Cost-Str model have negative r coefficients. SCP1 has a very low positive value. This shows that the occurrence of short notice to commence site work (SCP1) is not inversely proportional to the cost performance of the structural work subcontractors. All the six variables have the absolute r coefficients below 0.5 and they are lower than that of the SP-Cost-All model. SCP2 has the highest absolute value which is still only 0.368. Thus the variables are only very slightly linear related to cost performance for the structural work subcontractors.

b. Selecting variables for SP-Cost-Str model

Backward elimination method was used to compute the most simple regression equation of SP-Cost-Str model. Table 9.36 summarizes the regression equations in each stage of elimination process. Five stage regression equations were generated in the analysis. The Sp-Cost-Str-final equation consists of SCP1 and SCP2 which are not included in the SP-Cost-All-final equation. The SP-Cost-Str-final equation shows that the time performance of the structural work subcontractors depends on the *occurrence of two site coordination problems: short notice to commence site work (SCP1)* and *late to provide plant support (SCP2).*

Table 9.36: Regression equations of SP-Cost-Str model

Model	Regression equations
SP-Cost-Str-1	Cost = 8.223 + 0.249xSCP1 - 0.371xSCP2 - 0.118x SCP3 + 0.065xSCP4 + 0.067xSCP5 - 0.043xSCP6
SP-Cost-Str-2	Cost = 8.237 + 0.251xSCP1 - 0.370xSCP2 - 0.118xSCP3 + 0.066xSCP4 - 0.042xSCP6
SP-Cost-Str-3	Cost = 8.091 + 0.258xSCP1 - 0.387xSCP2 - 0.117x SCP3 + 0.057xSCP4
SP-Cost-Str-4	Cost = 8.181 + 0.270xSCP1 - 0.359xSCP2 - 0.104xSCP3
SP-Cost-Str-final	Cost = 8.096 + 0.226xSCP1– 0.399xSCP2

c. Explaining the variability for SP-Cost-Str model

Table 9.37 summarizes the R, R square, Adjusted R Square, F-statistic and Significance Level values of the five stage equations for SP-Cost-Str model. All the five stage equations do not have good linear relationship with cost performance as their R values are below 0.5. The R values of SP-Cost-Str-1 and SP-Cost-Str-2 are the same. SCP5 should have the least contribution to the cost performance for structural work.

Table 9.37: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Cost-Str model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Cost-Str-1		0.483	0.233	0.063	1.367	0.264
SP-Cost-Str-2	SCP5	0.483	0.233	0.096	1.700	0.167
SP-Cost-Str-3	SCP6	0.480	0.230	0.124	2.167	0.980
SP-Cost-Str-4	SCP4	0.475	0.226	0.148	2.912	0.051
SP-Cost-Str-Final	SCP3	0.463	0.214	0.163	4.220	0.024

9.7.4 Analysis for building services work subcontractors (SP-Cost-BS)

a. The correlation coefficient of SP-Cost-BS model

Table 9.38 summarizes the Pearson correlation coefficient (r) of the six site coordination problems in a descending order of priority of their absolute values of the SP-Cost-BS model and the comparison with the value of SP-Cost-All model. In building services work, only SCP3 is strongly related to cost performance as its absolute r coefficients is above 0.6. The absolute r coefficients of the other five variables are lower than 0.5.

Table 9.38: Correlation coefficients of SP-Cost-BS model and comparison with SP-Cost-All model

Variables	A	B	C
SCP3	-0.623	-0.471	0.152
SCP1	-0.421	-0.373	0.048
SCP5	-0.364	-0.223	0.141
SCP2	-0.339	-0.367	-0.028
SCP4	-0.327	-0.398	-0.071
SCP6	-0.261	-0.294	-0.033

A: Pearson correlation coefficient (r) of SP-Time-BS model.

B: Pearson correlation coefficient (r) of SP-Time-All model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for SP-Cost-BS model

Backward elimination method was adopted to reduce the number of computations in formulating the stage of regression equations of SP-Cost-BS model. Table 9.39 lists the regression equations in each step of elimination process. Six stage regression equations were generated in the analysis. The SP-Cost-BS-final equation consists of SCP3 only which has the highest absolute r coefficient. SCP3 is also an independent variable in SP-Cost-All-final model. The regression equation of SP-Cost-BS-final model is very simple consisting one independent variable only. This indicates that *the site coordination problem-interfacing work not yet completed (SCP3)* is a dominant factor influencing the cost performance of the structural work subcontractors.

Table 9.39: Regression equations of SP-Cost-Str model

Model	Regression equations
SP-Cost-BS-1	Cost = 8.858 + 0.067xSCP1 - 0.014xSCP2 - 0.535x SCP3 + 0.084x SCP4 - 0.002xSCSCP5 - 0.046xSCP6
SP-Cost-BS-2	Cost = 8.858 + 0.067xSCP1 - 0.014x SCP2 - 0.535xSCP3 + 0.082x SCP4 - 0.047xSCP6
SP-Cost-BS-3	Cost = 8.864 + 0.071xSCP1 - 0.539x SCP3 + 0.075x SCP4 -0.050xSCP6
SP-Cost-BS-4	Cost = 8.709 + 0.047x SCP1 - 0.538xSCP3 + 0.071x SCP4
SP-Cost-BS-5	Cost = 8.744 - 0.516SCP3 + 0.089x SCP4
SP-Cost-BS-final	Cost = 9.077 - 0.472xSCP3

c. Explaining the variability of SP-Cost-BS model

Table 9.40 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values for the six stage equations of SP-Cost-BS model. The R values for all the six equations are above 0.6 and thus these models can give good explanation of the cost performance of the building services work subcontractors. The R values of the first three models of the elimination process are the same. This shows that SCP5 and SCP2 are not most critical to the cost performance.

Table 9.40: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Cost-BS model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Cost-BS-1		0.630	0.397	0.288	3.625	0.007
SP-Cost-BS-2	SCP5	0.630	0.397	0.309	4.482	0.003
SP-Cost-BS-3	SCP2	0.630	0.397	0.328	5.765	0.001
SP-Cost-BS-4	SCP6	0.629	0.395	0.345	7.842	0.000
SP-Cost-BS-5	SCP1	0.628	0.394	0.361	12.035	0.000
SP-Cost-BS-final	SCP4	0.623	0.389	0.373	24.163	0.000

9.7.5 Neural network analysis for cost performance

The results computed by NeuroShell 2 software for cost performance analysis of different models are summarized in the descending order of priority of their correlation coefficients in Table 9.41. All outputs of the cost performance analysis except the SP-Cost-Str model outputs have correlation coefficient higher than 0.5. The output of SP-Cost-BS-1 has the highest correlation coefficient.

Table 9.41: Neural network analysis for cost performance

Model	A	B	C	D
SP-Cost-BS-1	0.741	10	40	0.0010414
SP-Cost-BS-final	0.688	7	40	0.0006779
SP-Cost-All-1	0.594	14	117	0.0011366
SP-Cost-All-final	0.514	12	117	0.0028543
SP-Cost-Fin-1	0.565	10	43	0.0002024
SP-Cost-Fin-final	0.578	7	43	0.0007973
SP-Cost-Str-1	0.472	9	34	0.0014023
SP-Cost-Str-final	0.422	7	34	0.0015519

A: Correlation coefficient.

B: Number of hidden neurons.

C: Number of patterns process.

D: Minimum error when the training was stopped.

9.7.6 Summary for cost performance analysis

Table 9.42 compares the correlation coefficients for the regression equations and neural network output. The correlation coefficients computed by the two methods are consistent in all the models. Except SP-Cost-BS-1, the differences of the correlation coefficients are less than 0.1. Five out of the eight equations and outputs have correlation coefficients higher than 0.5. They are fairly good to be used to predict the cost performance of subcontractors based on the occurrence of the site coordination problems. SCP5 and

SCP6 are not included in any of the simple form regression equation. So these variables are not very critical to the cost performance of the subcontractors.

Table 9.42: Comparison of multiple regression method and neural network method for cost performance

Model	A	B	C	D
SP- Cost -BS-1	All	0.630	0.741	-0.111
SP- Cost -BS-Final	SCP3	0.623	0.688	-0.065
SP-Cost-Fin-1	All	0.621	0.565	0.056
SP- Cost -Fin-final	SCP4	0.579	0.578	0.001
SP- Cost -All-1	All	0.506	0.594	-0.088
SP- Cost -All-final	SCP3, SCP4	0.496	0.514	-0.018
SP- Cost -Str-1	All	0.483	0.472	0.011
SP- Cost -Str-final	SCP1, SCP2	0.463	0.422	0.041

A: Independent variables in the model.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network method.

D: Difference of B and C.

9.8 Quality performance analysis

9.8.1 Analysis for all types of subcontractors (SP-Quality-All)

a. Outliers and descriptive statistics for SP-Quality-All model

The preliminary data analysis has identified two extreme cases by adopting Mahalanobis method. One hundred and fifteen cases were included in the multiple regression analysis after deleting the outliers. Table 9.43 provides the descriptive statistics for the SP-Quality-All model analysis in a descending order of priority of the mean score of the site coordination problems.

Table 9.43: Descriptive statistics for SP-Quality-All model

Variables	*Mean	Standard deviation
Quality	7.313	1.268
SCP4	5.935	1.409
SCP6	5.535	1.378
SCP5	5.039	1.341
SCP1	4.913	1.418
SCP3	4.787	1.496
SCP2	4.383	1.416

*Mean: mean score for achievement of quality performance or mean score for frequency of occurrence of site coordination problems respectively.

b. Examining the variables of SP-Quality-All model

The scatterplot matrix in Appendix P show that quality performance is basically linearly related to each of the site coordination problems. As a result, data transformation is not necessary.

c. Testing hypothesis for SP-Quality-All model

The F-statistics of the multiple regression analysis including all the six site coordination problems is 12.279. The value is high and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is thus rejected and there should be at least one of the coefficients is not 0.

d. The Pearson correlation coefficients of SP-Quality-All model

Table 9.44 summarizes the Pearson correlation coefficients of the six variables in a descending order of their absolute values. As the quality performance achievement should be decreased with the increase of occurrence of site coordination problems according to basic principle, all the correlation coefficients are of negative values. The data of the variables are not well fit the models as only SCP3 and SCP1 have the absolute r coefficients slightly above 0.5.

Table 9.44: Correlation coefficient of SP-Quality-All model

Variables	Pearson correlation coefficient (r)
SCP3	-0.586
SCP1	-0.539
SCP4	-0.491
SCP2	-0.485
SCP5	-0.353
SCP6	-0.316

e. Selecting variables for SP-Quality-All model

Backward elimination analysis has generated five stage regression equations for SP-Quality-All model. SCP1 and SCP3 were remained in the SP-Quality-All-final equation. Table 9.45 summarizes the regression equations in each step of elimination process.

Table 9.45: Regression equations of SP-Quality-All model

Model	Regression equations
SP-Quality-All-1	Quality = 10.564 - 0.160xSCP1 - 0.096xSCP2 - 0.283xSCP3 -0.094xSCP4 - 0.024xSCP5 - 0.002xSCP6
SP-Quality-All-2	Quality = 10.559 - 0.161xSCP1 - 0.096xSCP2 - 0.283xSCP3 - 0.094xSCP4 -0.024xSCP5
SP-Quality-All-3	Quality = 10.511 - 0.160xSCP1 - 0.100xSCP2 - 0.288xSCP3 - 0.100xSCP4
SP-Quality-All-4	Quality = 10.310 - 0.199xSCP1 - 0.140xSCP2 - 0.294xSCP3
SP-Quality-All-final	Quality = 10.151 - 0.241xSCP1 - 0.345xSCP3

The SP-Cost-All-final equation shows that subcontractors' quality performance mainly depends on the occurrence of two site coordination problems: *short notice to commence site work (SCP1)* and *interfacing work by other subcontractor not yet completed (SCP3).*

f. Explaining the variability of SP-Quality-All model

Table 9.46 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the five SP-Quality-All model stage equations. The stages equations are good to explain the variability of the quality performance as their R values are above 0.6. The R values of the first three stage equations are the same. Thus SCP6 and SCP5 can be eliminated without inducing any significant impact to quality performance of the subcontractors.

Table 9.46: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Quality-All model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Quality-All-1		0.636	0.405	0.372	12.233	0.000
SP-Quality-All-2	SCP6	0.636	0.405	0.377	14.815	0.000
SP-Quality-All-3	SCP5	0.636	0.404	0.382	18.652	0.000
SP-Quality-All-4	SCP4	0.631	0.399	0.382	24.522	0.000
SP-Quality-All-final	SCP2	0.620	0.384	0.373	34.887	0.000

9.8.2 Analysis for finishing work subcontractors (SP-Quality-Fin)

a. The correlation coefficient of SP-Quality-Fin model

Table 9.47 summarizes the Pearson correlation coefficient (r) of the six site coordination problems in a descending order of priority of their absolute values of SP-Quality-Fin model and the comparison with the r coefficients of SP-Quality-All model. SP-Quality-Fin model can fit the data of quality performance better than SP-Quality-All model as the r coefficients of all variables except SCP3 are higher than that of SP-Quality-All model.

Table 9.47: Correlation coefficients of SP-Quality-Fin model and comparison with SP-Quality-All model

Variables	A	B	C
SCP2	-0.612	-0.485	0.127
SCP4	-0.591	-0.491	0.100
SCP1	-0.560	-0.539	0.021
SCP3	-0.458	-0.586	-0.128
SCP6	-0.452	-0.316	0.136
SCP5	-0.401	-0.353	0.048

A: Pearson correlation coefficient (r) of SP-Quality-Fin model.

B: Pearson correlation coefficient (r) of SP-Quality-All model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for SP-Quality-Fin model

Table 9.48 lists the regression equations in each step of backward elimination process. Five stage equations were generated in the analysis. SCP2 and SCP4 were remained in the SP-Quality-Fin-final equation, which are not included in the SP-Quality-All-final equation. The SP-Time-Fin-final equation of model shows that quality performance of the finishing work subcontractors is mainly influenced by two site coordination problems: *late to provide plant support (SCP2)* and *interfacing work not yet completed (SCP4).*

Table 9.48: Regression equations of SP-Quality-Fin model

Model	Regression equations
SP-Quality-Fin-1	Quality = 10.902 - 0.153xSCP1 - 0.237xSCP2 - 0.031x SCP3 - 0.182xSCP4 – 0.107xSCP5 - 0.071xSCP6
SP-Quality-Fin-2	Quality = 10.936 - 0.143xSCP1 - 0.225xSCP2 - 0.188xSCP4 - 0.105xSCP5 - 0.062xSCP6
SP-Quality-Fin-3	Quality = 10.875 - 0.165x SCP1 - 0.221x SCP2 - 0.205x SCP4 - 0.121xSCP5
SP-Quality-Fin-4	Quality = 10.736 - 0.278xSCP2 - 0.282xSCP4 - 0.112xSCP4
SP-Quality-Fin-final	Quality = 10.449 - 0.319xSCP2 - 0.296xSCP4

c. Explaining the variability of SP-Quality-Fin model

Table 9.49 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance level values for the five stage equations for SP-Quality-Fin model.

Table 9.49: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Quality-Fin model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Quality-Fin-1		0.671	0.450	0.358	4.910	0.001
SP-Quality-Fin-2	SCP3	0.670	0.450	0.375	6.043	0.000
SP-Quality-Fin-3	SCP6	0.669	0.447	0.389	7.667	0.000
SP-Quality-Fin-4	SCP1	0.658	0.434	0.390	9.952	0.000
SP-Quality-Fin-final	SCP5	0.649	0.421	0.392	14.528	0.000

The five stage equations are strongly related to quality performance as their R values are over 0.6. The R value has gradually reduced by 0.001 in each of the first three elimination stages. This demonstrates that SCP3, SCP6 and SCP1 only have similar impact to the quality performance of the finishing work subcontractors.

9.8.3 Analysis for structural work subcontractors (SP-Quality-Str)

a. The correlation coefficient for SP-Quality-Str model

Table 9.50 summarizes the Pearson correlation coefficient of the six site coordination problems in a descending order of priority of their absolute values of SP-Quality-Str model and the comparison with the values of SP-Quality-All model. The r coefficients of all the six variables of SP-Quality-Str model are higher than that of SP-Quality-All model. This shows that the data for structural work subcontractors can better explain the quality performance than the overall data. Four out of six variables have r coefficients higher than 0.5. SCP3 is strongly related to quality performance as its absolute value is over 0.7.

Table 9.50: Correlation coefficients of SP-Quality-Str model and comparison with SP-Quality-All model

Variables	A	B	C
SCP3	-0.722	-0.586	0.136
SCP2	-0.609	-0.485	0.124
SCP4	-0.593	-0.491	0.102
SCP1	-0.590	-0.539	0.051
SCP5	-0.424	-0.353	0.071
SCP6	-0.372	-0.316	0.056

A: Pearson correlation coefficient (r) of SP-Quality-Str model.

B: Pearson correlation coefficient (r) of SP-Quality-All model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for SP-Quality-Str model

Table 9.51 summarizes the regression equations in each stage of backward elimination process. Five stage regression equations were generated in the analysis. The SP-Quality-Str-final equation consists of SCP3 and SCP6. SCP3 is also a variable included in the SP-Quality-All-final equation. The SP-Quality-Str-final equation shows that the quality performance of the structural work subcontractors mainly depends on two site coordination problems: *interfacing work not yet completed (SCP3)* and *construction information unclear or contradictory (SCP4).*

Table 9.51: Regression equations for SP-Quality-Str models

Model	Regression equations
SP-Quality-Str-1	Quality = 11.676 - 0.117xSCP1 - 0.078xSCP2 - 0.423x SCP3 - 0.099xSCP4 - 0.001xSCP5 - 0.157xSCP6
SP-Quality-Str-2	Quality = 11.673 - 0.117xSCP1 - 0.078xSCP2 - 0.423xSCP3 - 0.099xSCP4 - 0.157xSCP6
SP-Quality-Str-3	Quality = 11.688 - 0.133xSCP1 - 0.443xSCP3 - 0.119xSCP4 - 0.174x SCP6
SP-Quality-Str-4	Quality = 11.532 - 0.511xSCP3 - 0.155xSCP4 - 0.165xSCP6
SP-Quality-Str-final	Quality = 11.304 - 0.604xSCP3 - 0.210xSCP6

c. Explaining the variability for SP-Quality-Str model

Table 9.52 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the five stage equations of SP-Quality-Str model. All the five stage equations can strongly explain the quality performance of structural work subcontractors as their R values are above 0.7. There is no change to the R value when SCP5 is eliminated. The R value of SP-Quality-Str-final equation is 0.133 higher than that of SP-Quality-All-final equation.

Table 9.52: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Quality-Str model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Quality-Str-1		0.777	0.603	0.515	6.485	0.000
SP-Quality-Str-2	SCP5	0.777	0.603	0.533	8.519	0.000
SP-Quality-Str-3	SCP2	0.775	0.600	0.545	10.895	0.000
SP-Quality-Str-4	SCP1	0.767	0.589	0.548	14.314	0.000
SP-Quality-Str-final	SCP4	0.753	0.567	0.539	20.270	0.000

9.8.4 Analysis for building services work subcontractors (SP-Quality-BS)

a. The correlation coefficients of SP-Quality-BS model

Table 9.53 summarizes the Pearson correlation coefficient (r) for the six site coordination problems in a descending order of priority of their absolute values of SP-Quality-BS model and the comparison with the value of SP-Quality-All model. All variables except SCP3 have absolute r coefficients higher than 0.5 and are lower than that of SP-Quality-All model. The SCP6 is poorly linear related to quality performance as its absolute r value is very low.

Table 9.53: Correlation coefficients of SP-Quality-BS model and comparison with SP-Quality-All model

Variables	A	B	C
SCP3	-0.631	-0.586	0.045
SCP1	-0.486	-0.539	-0.053
SCP4	-0.309	-0.491	-0.182
SCP5	-0.289	-0.353	-0.064
SCP2	-0.265	-0.485	-0.220
SCP6	-0.145	-0.316	-0.171

A: Pearson correlation coefficient (r) of SP-Quality-BS model.

B: Pearson correlation coefficient (r) of SP-Quality-All model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for SP-Quality-BS model

Table 9.54 lists the regression equations n each step of elimination process. Six stage equations were formulated in the analysis. The SP-Quality-BS-final equation only consists of one independent variable: SCP3, which is also included in SP-Quality-All-final equation. The SP-Quality-BS-final equation is very simple and consists of one variable only. This shows that quality performance of the structural work subcontractors is mainly governed by one site coordination problem: *interfacing work not yet completed (SCP3).*

Table 9.54: Regression equations of SP-Quality-BS model

Model	Regression equations
SP-Quality-BS-1	Quality = 8.652 - 0.157xSCP1 - 0.038xSCP2 - 0.505x SCP3 + 0.104x SCP4 + 0.045xSCSCP5 + 0.129xSCP6
SP-Quality-BS-2	Quality = 8.651 - 0.173xSCP1 + 0.027xSCP2 - 0.489x SCP3 + 0.135x SCP4 + 0.144xSCP6
SP-Quality-BS-3	Quality = 8.639 - 0.180xSCP1 - 0.482xSCP3 + 0.149xSCP4 + 0.151xSCP6
SP-Quality-BS-4	Quality = 9.030 - 0.120xSCP1 - 0.449xSCP3 + 0.161xSCP6
SP-Quality-BS-5	Quality = 9.947 - 0.514xSCP3 + 0.122xSCP6
SP-Quality-BS-final	Quality = 9.487 - 0.475xSCP3

c. Explaining the variability of SP-Quality-BS model

Table 9.55 below summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values for the six stage equations of SP-Quality-BS model.

Table 9.55: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of SP-Quality-BS model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
SP-Quality-BS-1		0.659	0.434	0.331	4.212	0.003
SP-Quality-BS-2	SCP5	0.658	0.433	0.350	5.194	0.001
SP-Quality-BS-3	SCP2	0.658	0.433	0.368	6.672	0.000
SP-Quality-BS-4	SCP4	0.648	0.420	0.371	8.674	0.000
SP-Quality-BS-5	SCP1	0.642	0.412	0.381	12.980	0.000
SP-Quality-BS-final	SCP6	0.631	0.398	0.382	25.149	0.000

The R values of all the six stage equations are above 0.6 and this shows that they are can well explain the quality performance of the structural work subcontractors. The R values of the first three stage equations are almost the same. SCP5 and SCP2 can thus be removed without having any significant impact to quality performance. The R value of SP-Quality-Str-final equation is only 0.011 higher than that of SP-Quality-All-final equation.

9.8.5 Neural network analysis for quality performance

Table 9.56 summarises the results computed by NeuroShell 2 for quality performance analysis in a descending order of priority of their correlation coefficients. All the neural networks outputs except that of SP-Quality-Str-1 are well fit to the data as their correlation coefficients are all over 0.6. The SP-Quality-BS-1 output has the highest correlation coefficient which is over 0.65.

Table 9.56: Neural network analysis for quality performance

Model	A	B	C	D
SP-Quality-BS-1	0.876	10	10	0.0014589
SP-Quality-BS-final	0.633	7	10	0.0014196
SP-Quality-Fin-1	0.657	10	43	0.0000340
SP-Quality-Fin-final	0.646	8	43	0.0001712
SP-Quality-All-1	0.622	14	14	0.0010516
SP-Quality-All-final	0.611	12	14	0.0011757
SP-Quality-Str-1	0.378	9	34	0.0015638
SP-Quality-Str-final	0.770	7	34	0.0013248

A: Correlation coefficient.

B: Number of hidden neurons.

C: Number of patterns process.

D: Minimum error when the training was stopped.

9.8.6 Summary for quality performance analysis

The comparison of the correlation coefficient for regression equations and neural network outputs are shown in Table 9.57. All the regression equations except SP-Quality-Str-1 and SP-Quality-BS-1 are reliable to explain the quality performance of the subcontractors as their correlation coefficients computed by the two methods are consistent. The simple form regression equations consist of one to two independent variables only. SCP3 appear in three out of the four simple form equations.

Table 9.57: Comparison of multiple regression method and neural network analysis for quality performance

Regression equation/ Output	A	B	C	D
SP-Quality-Fin-1	All	0.671	0.657	0.014
SP-Quality-Fin-final	SCP2, SCP4	0.649	0.646	0.003
SP-Quality-Str-1	All	0.777	0.378	0.399
SP-Quality-Str-final	SCP3, SCP6	0.753	0.770	-0.017
SP-Quality-All-1	All	0.636	0.622	0.014
SP-Quality-All-final	SCP1, SCP3	0.620	0.611	0.009
SP-Quality-BS-1	All	0.659	0.876	-0.217
SP-Quality-BS-Final	SCP3	0.631	0.633	-0.002

A: Independent variable included the model.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network analysis method.

D: Difference of B and C.

9.9 Summary

A questionnaire survey was conducted to collect data to formulate equations that explained the performance of the subcontractors based on the occurrence of critical site coordination problems. One hundred seventeen valid replies were collected. A descriptive statistic analysis was carried out to give preliminary information of the data. Multiple regression method was used to generate the equations to forecast the performance. The data were also processed by neural network software and the outputs of the analyses were used to cross check the accuracy of the regression equation.

The descriptive statistic analysis shows that subcontractors have better performance in quality. Their achievements in cost and time are similar. The structural work subcontractors can achieve better project outcomes than the building services work subcontractors and finishing work subcontractors. This may be because the sequence of structure work is more straightforward and involves less interfacing work than the other trades. As a result, they have better performance.

SPSS software was used to generate the multiple regression equations. The analysis covered one main model for the three project outcomes separately. There were three sub-models for each of the main models for different types of subcontractors. As a result, the analysis covered 12 models. Table 9.58 summarizes the standard form regression equations for different models in the descending order of their R values. All of them except SP-Cost-Str-1 are good to explain the relationship between project outcomes and site coordination problems as they have the R values over 0.5. The regression equations for the time performance are more accurate than other project outcomes as their R values are high. This may be because the measurement of time performance achievement is more reliable than other two project outcomes. As mentioned in the previous chapter that time is the most important criterion to assess the performance of the subcontractors in the local project. Thus, most the respondents of this questionnaire always have the accurate information about the progress of work.

Table 9.58: R value for the standard form regression equations for project performance

Model	Regression equation	R value
SP-Time-Fin-1	Time = 13.896 - 0.265xSCP1 - 0.429xSCP2 - 0.094xSCP3 - 0.300xSCP4 – 0.158xSCP5 - 0.194xSCP6	0.906
SP-Time-Str-1	Time = 12.299 - 0.350xSCP1 - 0.421xSCP2 - 0.420xSCP3 + 0.117xSCP4 + 0.119xSCP5 - 0.155xSCP6	0.844
SP-Quality-Str-1	Quality = 11.676 - 0.117xSCP1 - 0.078xSCP2 - 0.423xSCP3 - 0.099xSCP4 - 0.001xSCP5 - 0.157xSCP6	0.777
SP-Time-All-1	Time = 11.645 - 0.229xSCP1 - 0.343xSCP2 - 0.314xSCP3 - 0.031xSCP4 + 0.001xSCP5 - 0.068xSCP6	0.762
SP-Time-BS-1	Time = 8.906 - 0.075xSCP1 - 0.120xSCP2 - 0.498xSCP3 + 0.191xSCP4 - 0.047xSCP5 + 0.062xSCP6	0.722
SP-Quality-Fin-1	Quality = 10.902 - 0.153xSCP1 - 0.237xSCP2 - 0.031xSCP3 - 0.182xSCP4 – 0.107xSCP5 - 0.071xSCP6	0.671
SP-Quality-BS-1	Quality = 8.652 - 0.157xSCP1 - 0.038xSCP2 - 0.505xSCP3 + 0.104xSCP4 + 0.045xSCSCP5 + 0.129xSCP6	0.659
SP-Quality-All-1	Quality = 10.564 – 0.160xSCP1 - 0.096xSCP2 - 0.283xSCP3 - 0.094xSCP4 - 0.024xSCP5 - 0.002xSCP6	0.636
SP-Cost-BS-1	Cost = 8.858 + 0.067xSCP1 - 0.014xSCP2 - 0.535xSCP3 + 0.084xSCP4 - 0.002xSCSCP5 - 0.046xSCP6	0.630
SP-Cost-Fin-1	Cost = 11.013 - 0.155xSCP1 +.179xSCP2 - 0.277xSCP3 - 0.569xSCP4 – 0.016xSCP5 +0.098xSCP6	0.621
SP-Cost-All-1	Cost = 9.522 + 0.015xSCP1 - 0.040xSCP2 - 0.308xSCP3 - 0.162xSCP4 + 0.084xSCP5 - 0.087xSCP6	0.506
SP-Cost-Str-1	Cost = 8.223 + 0.249xSCP1 - 0.371xSCP2 - 0.118xSCP3 + 0.065xSCP4 + 0.067xSCP5 - 0.043xSCP6	0.483

Some of the site coordination problems (independent variables) of the regression equations can be eliminated without imposing any major influence to the project outcomes (dependent variables). This can enable the main contractor to focus their efforts in handling the most critical site coordination problems. Table 9.59 lists the simple form regression equations that were formulated by adopting backward elimination method in the descending order of priority of their R values. Table 9.60 analyses the importance of independent variables to the project outcomes. *Interfacing work not yet completed (SCP3)* is the most importance site coordination problem to subcontractors' performance as it is the independent variable of eight out of the twelve simple form regression equations. Main contractor can take less attention on *insufficient construction information problem (SCP5)* as none of the simple form regression equation has this independent variable. Problems related to *construction information (SCP5 & SCP6)* are not most critical in the cost performance of the subcontractors.

Table 9.59: Summary of the simple form regression equations for project performance

Model	Regression equation	R value
SP-Time-All-final	Time = 11.384 - 0.259xSCP1 - 0.368xSCP2 - 0.320xSCP3	0.760
SP-Time-Fin-final	Time = 13.375 – 0.607x SCP2 – 0.384xSCP4 – 0.333xSCP6	0.890
SP-Time-Str-final	Time = 12.227 – 0.271x SCP1– 0.407xSCP2 – 0.394xSCP3	0.831
SP-Time-BS-final	Time = 9.361 – 0.506SCP3	0.711
SP-Quality-All-final	Quality = 10.151 - 0.241xSCP1 - 0.345xSCP3	0.620
SP-Quality-Fin-final	Quality = 10.449 – 0.319xSCP2 – 0.296xSCP4	0.649
SP-Quality-Str-final	Quality = 11.304 - 0.604xSCP3– 0.210xSCP6	0.753
SP-Quality-BS-final	Quality = 9.487 - 0.475x SCP3	0.631
SP-Cost-All-final	Cost = 9.490 - 0.311xSCP3 - 0.176xSCP4	0.496
SP-Cost-Fin-final	Cost = 10.478 – 0.635xSCP4	0.606
SP-Cost-BS-final	Cost = 9.077 – 0.472xSCP3	0.623
SP-Cost-Str-final	Cost = 8.096 + 0.226xSCP1– 0.399xSCP2	0.463

Table 9.60: **Analysis of the importance of the site coordination problems**

Site coordination problem	A	Project outcome	Type of subcontractor
SCP3	8	Time, Quality, Cost	All type Finishing work Structural work Building services work
SCP2	5	Time, Quality, Cost	All type Finishing work Structural work
SCP1	4	Time, Quality, Cost	All type Structural work
SCP4	4	Time, Quality, Cost	All type Finishing work
SCP6	2	Time, Quality	Finishing work Structural work
SCP5	0	-	-

A: Total number of simple form regression equations has that site coordination problem.

CHAPTER TEN

CONTRIBUTIONS OF THE CAUSES TO THE SITE COORDINATION PROBLEMS

10.1 Introduction

The aim of this chapter is to explain the data analysis process that generates the equations that assess the contributions of the twelve essential causes to the six critical coordination problems in HK building projects.

10.2 Research methodology

Data collected from Section D of the questionnaire, attached as Appendix A, were used for this stage of work. Respondents of the questionnaire are requested to assign a score from 10 (totally agree) to 0 (totally disagree) with a 0.5 interval to represent their views on the contributions of the causes to the occurrence of the critical site coordination problems.

Descriptive statistic analysis was used in the preliminary examination of the data. Multiple regression analysis using SPSS software was used in the formulation of the regression equations used to assess the contributions of the causes to each of the site coordination problems. In order to determine the views from the different parties involved in the subcontracts, the data analyses were conducted under four headings:

overall data that included data from Subcontractors, data from Main Contractors and *data from Consultants/clients.* Apart from the stepwise multiple regression method, the backward elimination method was also applied in order to identify the 'most essential' causes of the individual site coordination problems from the perspectives of the different parties. Neural network analysis using NeuroShell2 software was conducted to validate the multiple regression analysis results. A comparison of the views from different parties is presented in the conclusion of this chapter. The SPSS regression printouts and the neural network analysis outputs for this chapter are attached as Appendix Q and R respectively.

10.3 Coding system

In addition to the coding system used in Chapter Nine, the coding systems shown in Table 10.1 and Table 10.2 were adopted to simplify the description of the essential terms and enhance the understanding of the data analysis in this chapter.

Table 10.1: Coding system for general terms

Code	Item
Ca	Cause of site coordination problem
AR	All type of respondents
MC	Main contractors
SC	Subcontractors
CC	Clients and Consultants

Table 10.2: Coding system for causes of site coordination problems

Code	Cause of site coordination problem
Ca1	Staff of the main contractor are too inexperienced to coordinate the technical administration work.
Ca2	Staff of the main contractor are too inexperienced to coordinate the site work.
Ca3	Main contractor does not have sufficient directly employed workers to carry out the temporary work.
Ca4	Main contractor does not have sufficient staff to coordinate the site work.
Ca5	Main contractor does not have sufficient staff to coordinate the technical administration work.
Ca6	Main contractor does not have sufficient technical support from the head office.
Ca7	Design of the temporary work provided by main contractor cannot meet the requirements requested by the subcontractors.
Ca8	Job duties of main contractor's staff are unclear.
Ca9	Communication paths within the main contractor organization are unclear.
Ca10	Frontline staff of main contractor do not have sufficient authority to handle the site coordination.
Ca11	Accountability systems within the main contractor organization are unclear.
Ca12	Main contractor's site coordination system demands too much paper work.

10.4 Descriptive statistic for the causes of site coordination problems

10.4.1 Type of respondents

One hundred and ninety-seven valid replies were collected for the analysis of the causes of the site coordination problems. The respondents were grouped into three headings shown in Table 10.3 and Figure 10.1. For each site coordination problem, four analysis exercises were conducted to investigate the views that represented: the industry as a whole; subcontractors; main contractors; and consultants/clients. A summary of the data for this chapter is attached as Appendix S.

Table 10.3: Type of respondents of the questionnaire survey on the causes of site coordination problems

Type of respondent	Number of replies
Subcontractors	117
Main contractors	55
Consultants and clients	25
Total	197

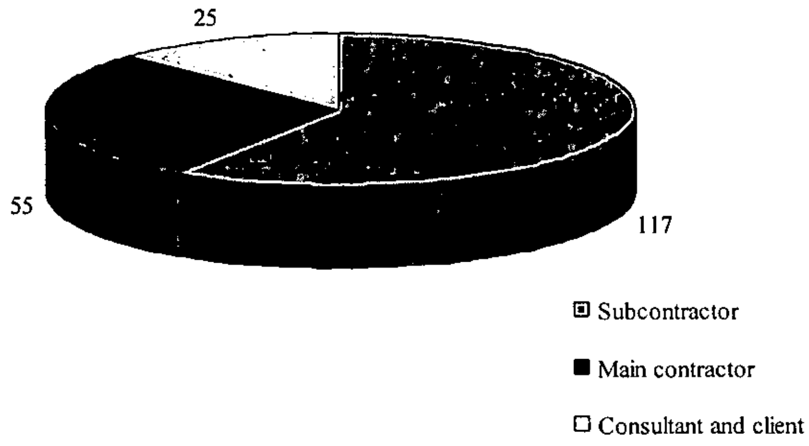

Figure 10.1: Distribution of the replies of the causes of site coordination problems survey

10.4.2 Descriptive statistics for all replies

Table 10.4 summarizes the descriptive statistics for the frequency of occurrence of the site coordination for all types of respondents in a descending order of priority of their mean scores. Five out of the six essential site coordination problems are considered as fairly frequently occurred problems as their mean scores are slightly higher than 5 under the 10-point scoring system. The difference in mean score between the most frequently occurred problem, SCP4 and the least frequently occurred problems, SCP2 is only 1 and the standard deviation of these six problems are quite consistent. It can thus be concluded that these six problems had the similar frequency of occurrence in the site operations.

Table 10.4: Descriptive statistics for site coordination problems for all types of respondents

Site coordination problem	Mean score for frequency of occurrence	Standard Deviation	Maximum score	Minimum score
SCP4	5.719	1.503	9.5	2
SCP6	5.462	1.487	9	1.5
SCP5	5.201	1.507	9	2
SCP1	5.071	1.511	10	1
SCP3	5.053	1.502	9	1
SCP2	4.721	1.513	9	1

The descriptive statistics for the contribution of the causes to the site coordination problems for all types of respondents has been summarized in Table 10.5 in a descending order of priority of their mean scores. All the causes are regarded to have essential contribution to the occurrence of the site coordination problems as their mean scores are over 5 under the 10-point scoring system. The mean score of the most essential cause, Ca9 is 6.297 which is only 1.025 higher than lowest mean score cause, Ca6. This shows that there was no dominant cause to the site coordination problems. The standard deviations of the causes are around two and are relatively high under the 10-point scoring system.

Table 10.5: Descriptive statistics for causes of site coordination problems for all types of respondents

Causes	Mean score	Standard deviation	Maximum score	Minimum score
Ca9	6.297	2.178	10	1
Ca8	6.170	1.918	10	2
Ca1	6.127	1.990	10	1.5
Ca10	5.939	1.767	10	1
Ca3	5.660	1.999	10	0
Ca4	5.652	2.023	10	1
Ca12	5.599	1.964	10	1
Ca2	5.561	1.988	10	1
Ca5	5.510	1.996	10	1
Ca11	5.338	2.009	10	1
Ca7	5.272	2.022	9	1
Ca6	5.117	1.938	10	0

a. Comparison between subcontractors and the overall data

Table 10.6 compares the data of the subcontractors with the overall data. The order of priority of the frequency of occurrence of the site problems of these two sets of data is the same. But, the difference between the most and the least frequently occurred problems of the replies from subcontractors is enlarged to 1.547. The total mean score of the problems is 30.701 and is 0.526 lower than that of the overall data. This indicates that the total amount of site coordination problems in a project claimed by subcontractor was less than those claimed by the main contractors and consultants/clients. This may be because subcontractors only assigned the score for the questionnaire based their own subcontracts while the other respondents assigned the score based on the whole building project and thus they have to face more site coordination problems.

Table 10.6: Comparison between subcontractors and the overall data for site coordination problems

Site coordination problem	A	B	C
SCP4	5.949	5.719	0.230
SCP6	5.551	5.462	0.089
SCP5	5.064	5.201	-0.137
SCP1	4.927	5.071	-0.144
SCP3	4.808	5.053	-0.245
SCP2	4.402	4.721	-0.319

A: Mean score for frequency of occurrence of the site coordination problems of subcontractors.

B: Mean score for frequency of occurrence of the site coordination problems of the overall data.

C: Difference of A and B.

Table 10.7 compares the subcontractors' data with the overall data for the causes of site coordination problems. Subcontractors claimed that Ca9 was a dominant cause to the problems as its score is over 7 and is 0.718 higher than the second essential cause. The difference between the most and the least essential causes is enlarged to 1.991 compared with the overall data.

Table 10.7: Comparison between subcontractors and the overall data for causes of site coordination problems

Causes	A	B	C
Ca9	7.162	6.297	0.865
Ca8	6.444	6.170	0.274
Ca1	6.329	6.127	0.202
Ca12	5.765	5.599	0.166
Ca10	5.615	5.939	-0.324
Ca3	5.581	5.660	-0.079
Ca11	5.551	5.338	0.213
Ca7	5.500	5.272	0.228
Ca2	5.368	5.561	-0.193
Ca4	5.350	5.652	-0.302
Ca5	5.261	5.510	-0.249
Ca6	5.171	5.117	0.054

A: Mean score for the causes of site coordination problems of subcontractors.

B: Mean score for the causes of site coordination problems of overall data.

C: Difference of A and B.

b. Comparison between main contractors and the overall data

The comparison between the main contractors' data with the overall data has been presented in Table 10.8. The order of priority of the frequency of occurrence of these two sets of data is the same except SCP3 and SCP1. In fact, the difference in mean score of these problems is only 0.009. All the six problems were claimed by main contractors as slightly frequently occurred problems as their mean scores are just over 5. The difference between the most and the least frequently occurred problems is only 0.338. The total mean score of the problems is 31.785 which is 0.558 higher than that of the overall data.

Table 10.8: Comparison between the main contractors and the overall data for site coordination problems

Site coordination problem	A	B	C
SCP4	5.456	5.719	-0.263
SCP5	5.409	5.201	0.208
SCP3	5.273	5.053	0.220
SCP1	5.282	5.071	0.211
SCP6	5.247	5.462	-0.215
SCP2	5.118	4.721	0.397

A: Mean score for frequency of occurrence of the site coordination problems of main contractor.

B: Mean score for .frequency of occurrence of the site coordination problems of the overall data.

C: Difference of A-B.

The comparison between the main contractors' data and the overall data for causes of site coordination problems is shown in Table 10.9. Subcontractors claimed that Ca10 was a dominant cause to the problems as its score is 6.4 and is 0.764 higher than the second essential cause. The difference between the most and the least essential causes is 1.800 and is greater than that of the overall data. Ca11, Ca9 and Ca7 were regarded as non-essential causes by main contractors as their scores are lower than 0.5. Nine out of the twelve causes have lower mean scores than that of the overall data. This may indicates that main contractors to a certain extent did not admit that they were the main contributor to the site coordination problems.

Table 10.9: Comparison between the main contractors and the overall data for causes of site coordination problems

Causes	A	B	C
Ca10	6.400	5.939	0.461
Ca4	5.764	5.652	0.112
Ca6	5.655	5.117	0.538
Ca5	5.500	5.510	-0.010
Ca8	5.482	6.170	-0.688
Ca2	5.464	5.561	-0.097
Ca3	5.400	5.660	-0.260
Ca1	5.391	6.127	-0.736
Ca12	5.245	5.599	-0.354
Ca11	4.891	5.338	-0.447
Ca9	4.809	6.297	-1.488
Ca7	4.600	5.272	-0.672

A: Mean score for the causes of site coordination problems of main contractors.

B: Mean score for the causes of site coordination problems of overall data.

C: Difference of A and B.

c. Comparison consultants/clients and the overall data

Table 10.10 compares the consultants/clients' data with the overall data. The total mean score of the six problems of consultants/clients is 32.426 and is 1.233 higher than that of the overall data. This indicates that the total amount of problems expected by the consultants/clients in their projects was higher than that claimed by the main contractors and subcontractors. All the six problems were claimed by consultants/clients as slightly frequently occurred problems and their mean scores are slightly over 5.

Table 10.10: Comparison between the consultants/clients and the overall data for site coordination problems

Site coordination problem	A	B	C
SCP3	5.720	5.053	0.667
SCP6	5.520	5.462	0.058
SCP5	5.380	5.201	0.179
SCP2	5.340	4.721	0.619
SCP1	5.280	5.071	0.209
SCP4	5.220	5.719	-0.499

A: Mean score for frequency of occurrence of the site coordination problems of consultants/clients.

B: Mean score for frequency of occurrence of the site coordination problems of overall data.

C: Difference of A and B.

The comparison between the consultants/clients' data and the overall data for the causes of site coordination problems has been presented in Table 10.11. The data of the third party of a subcontractor, consultants/clients, shows that there is no dominant cause to the problems. The mean scores of the causes gradually decrease from the most to the least essential causes. However, the difference between the most and the least essential causes is enlarged to 1.500 compared with the overall data. All the causes have scores over 0.5 and ten of them have higher mean scores than that of the overall data. Eight causes were regarded as essential causes by clients/consultant as their scores are over 0.6.

Table 10.11: Comparison between consultants/clients and the overall data for causes of site coordination problems

Causes	A	B	C
Ca4	6.820	5.652	1.168
Ca1	6.800	6.127	0.673
Ca5	6.700	5.510	1.190
Ca2	6.680	5.561	1.119
Ca3	6.600	5.660	0.940
Ca10	6.440	5.939	0.501
Ca8	6.400	6.170	0.230
Ca6	6.200	5.117	1.083
Ca7	5.680	5.272	0.408
Ca12	5.600	5.599	0.001
Ca9	5.520	6.297	-0.777
Ca11	5.320	5.338	-0.018

A: Mean score for the causes of site coordination problems of consultants/clients.

B: Mean score for the causes of site coordination problems of the overall data.

C: Difference of A and B.

d. Summary of the descriptive statistics

Table 10.12 summarizes the highest mean scores for the causes of the site coordination problems in a descending order of priority. Ca9 has the highest mean score. The most essential cause was claimed by subcontractors. Eight out of the twelve highest mean score causes were assigned by consultants/clients. Only one cause was from the main contractors. This indicates that consultants/clients generally agreed that site coordination problems were caused by main contractors.

Table 10.12: Highest mean score for the causes of site coordination problems

Causes	Highest mean score	Type of respondents
Ca9	7.162	Subcontractors
Ca4	6.820	Consultants/clients
Ca1	6.800	Consultants/clients
Ca5	6.700	Consultants/clients
Ca2	6.680	Consultants/clients
Ca3	6.660	Consultants/clients
Ca8	6.444	Main contractors
Ca10	6.440	Consultants/clients
Ca6	6.200	Consultants/clients
Ca12	5.765	Subcontractors
Ca7	5.680	Consultants/clients
Ca11	5.551	Subcontractors

10.5 Type of models analyzed

10.5.1 Main models and sub-models

In the multiple regression analysis, the six critical site coordination problems are the dependent variables and twelve essential causes are the independent variables of the regression equations respectively. Similarly, the causes and the problems are the inputs and outputs of the neural network analysis. Six main models were processed for investigating the contributions of the twelve causes to each of the critical site coordination problems. In each main model, three sub-models were generated for each type of respondents. As a result, twenty-four models were compiled in this analysis and are listed in Table 10.13.

Table 10.13: Models generated to assess the contribution of the causes to the site coordination problems

Model code	Dependent variable	Type of model	Type of respondents
Ca-SCP1-AR	SCP1	Main model	All type of respondents
Ca-SCP1-SC	SCP1	Sub-model	Subcontractors
Ca-SCP1-MC	SCP1	Sub-model	Main contractors
Ca-SCP1-CC	SCP1	Sub-model	Consultants/clients
Ca-SCP2-AR	SCP2	Main model	All type of respondents
Ca-SCP2-SC	SCP2	Sub-model	Subcontractors
Ca-SCP2-MC	SCP2	Sub-model	Main contractors
Ca-SCP2-CC	SCP2	Sub-model	Consultants/clients
Ca-SCP3-AR	SCP3	Main model	All type of respondents
Ca-SCP3-SC	SCP3	Sub-model	Subcontractors
Ca-SCP3-MC	SCP3	Sub-model	Main contractors
Ca-SCP3-CC	SCP3	Sub-model	Consultants/clients

Table 10.13: Models generated to assess the contribution of the causes to the site coordination problems (Cont'd)

Ca-SCP4-AR	SCP4	Main model	All type of respondents
Ca-SCP4-SC	SCP4	Sub-model	Subcontractors
Ca-SCP4-MC	SCP4	Sub-model	Main contractors
Ca-SCP4-CC	SCP4	Sub-model	Consultants/clients
Ca-SCP5-AR	SCP5	Main model	All type of respondents
Ca-SCP5-SC	SCP5	Sub-model	Subcontractors
Ca-SCP5-MC	SCP5	Sub-model	Main contractors
Ca-SCP5-CC	SCP5	Sub-model	Consultants/clients
Ca-SCP6-AR	SCP6	Main model	All type of respondents
Ca-SCP6-SC	SCP6	Sub-model	Subcontractors
Ca-SCP6-MC	SCP6	Sub-model	Main contractors
Ca-SCP6-CC	SCP6	Sub-model	Consultants/clients

10.5.2. Standard form and simple form of regression equations

The regression equations of the models comprise twelve independent variables. In order to enable main contractors to enhance site coordination, the most essential causes among the twelve items have been identified by adopting the backward elimination method using SPSS software. In each stage of elimination process, the most insignificant variable was removed if probability of F-to-remove was equal or greater than 0.100. The process was stopped when no variables satisfied the elimination condition. Adopting the same system in Chapter Nine, the last stage regression equation of the elimination process is named as the simple form regression equation of a model and the equation using all the twelve independent variables is named as the standard form regression equation of a model.

As a cross checking process on the accuracy of the regression equations, the data were also processed by NeuralShell2. This neural network analysis covered both the standard form and simple form regression equations. A three layer back propagation paradigm neural network model was selected to analyse the data. Ten per cent of the data were extracted as the 'test set' for the network and complex and noisy mode was selected. As a result, learning rate and momentum factors is set to 0.05 and 0.5 respectively. Default number of hidden neurons was set. The calibration interval was set to 50 in order to achieve maximum accuracy. The training was stopped when the new test set average errors was climbing generally or at least not close to the lowest that has been shown. This software compiled a file to compare the actual and predicted outputs, and calculate the correlation coefficient of the hidden network which has been used to assess the reliability of the network. Table 10.14 illustrates the coding system for the standard and simple form of regression equations using the Ca-SCP1 model as an example.

Table 10.14: Coding system for the standard form and simple form regression equations

Code	**Type of regression equations**
Ca-SCP1-AR-1	Standard form
Ca-SCP1-AR-final	Simple form

10.6 Analysis for SCP1

10.6.1 Analysis for all type of respondents for SCP1 (Ca-SCP1-AR)

c. Outliers for Ca-SCP1-AR model

Two extreme cases were found by adopting the Mahalanobis statistical method and they were deleted from the data for the analysis. As a result, one hundred ninety-five sets of data were included in generating the regression equations.

a. Examining the variables of Ca-SCP1-AR model

The scatterplot matrix shown in Appendix S provides the preliminary information of relationship between SCP1 and the twelve causes. The plots show that the causes are fairly linearly related to site coordination problems, SCP1. There is thus no need to transform the data for the multiple regression analysis.

b. Testing hypothesis for Ca-SCP1-AR model

The F-statistics for the regression analysis with all the twelve causes to the site coordination problems, SCP1 is 7.903 and the observed significance level is 0.000. Thus the hypothesis that $b_k = 0$ is rejected. There is at least one of the coefficients is not 0.

c. The correlation coefficients of Ca-SCP1-AR model

Table 10.15 summarizes the Pearson correlation coefficient (r) of the twelve causes of the site coordination problems of Ca-SCP1-AR model in a descending order of priority. All causes have positive coefficient because the increase of the causes should increase the site coordination problems. The coefficients range from 0.540 to 0.118. Only Ca2 is fairly good in linear correlation with SCP1. The correlation coefficients of the other eleven causes are lower than 0.5.

Table 10.15: Correlation coefficient of Ca-SCP1-AR model

Variables	Pearson correlation coefficient (r)
Ca2	0.540
Ca4	0.486
Ca1	0.462
Ca5	0.426
Ca3	0.394
Ca7	0.363
Ca11	0.317
Ca8	0.311
Ca10	0.297
Ca6	0.293
Ca9	0.234
Ca12	0.118

c. Selecting variables for Ca-SCP1-AR model

Ten stage regression equations were generated in the analysis for Ca-SCP1-AR model. Ca2, Ca4 and Ca7 were remained in the Ca-SP1-AR-final regression equation. Table 10.16 shows the standard form and simple form regression equations.

Table 10.16: Regression equations of Ca-SCP1-AR model

Model	Regression equations
Ca-SCP1-AR-1	SCP1 = 2.115 + 0.086xCa1 + 0.223xCa2 - 0.026xCa3 + 0.073xCa4 + 0.077xCa5 - 0.054xCa6 + 0.126xCa7 - 0.017xCa8 - 0.028xCa9 + 0.051xCa10 + 0.037xCa11 - 0.016xCa12
Ca-SCP1-AR-final	SCP1 = 2.284 + 0.275xCa2 + 0.129xCa4 + 0.103xCa7

d. Explaining the variability of Ca-SCP1-AR model

Table 10.17 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations of Ca-SCP1-AR model.

Table 10.17: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP1-AR model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP1-AR-1		0.585	0.343	0.299	7.903	0.000
Ca-SCP1-AR-2	Ca8	0.585	0.342	0.303	8.661	0.000
Ca-SCP1-AR-3	Ca12	0.585	0.342	0.306	9.564	0.000
Ca-SCP1-AR-4	Ca11	0.584	0.341	0.309	10.659	0.000
Ca-SCP1-AR-5	Ca3	0.584	0.341	0.313	12.024	0.000
Ca-SCP1-AR-6	Ca9	0.583	0.340	0.315	13.770	0.000
Ca-SCP1-AR-7	Ca10	0.581	0.338	0.317	15.984	0.000
Ca-SCP1-AR-8	Ca1	0.578	0.335	0.317	19.000	0.000
Ca-SCP1-AR-9	Ca6	0.576	0.332	0.318	23.569	0.000
Ca-SCP1-AR-final	Ca5	0.573	0.328	0.318	31.092	0.000

All the ten stage regression equations are fairly good linearly correlated to SCP1 as their R values of these models are ranged from 0.585 to 0.573. The R values for first three stage equations are the same and thus Ca8 and Ca12 are not essential causes to SCP1.

10.6.2 Analysis for subcontractors for SCP1 (Ca-SCP1-SC)

a. The correlation coefficients of Ca-SCP1-SC model

One hundred and seventeen replies were from subcontractors. Table 10.18 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP1-SC model in a descending order of priority and the comparison with the Ca-SCP1-AR model.

Table 10.18: Correlation coefficients of Ca-SCP1-SC model and comparison with Ca-SCP1-AR model

Variables	A	B	C
Ca2	0.451	0.540	-0.089
Ca1	0.364	0.462	-0.098
Ca7	0.362	0.363	-0.001
Ca5	0.352	0.426	-0.074
Ca4	0.324	0.486	-0.162
Ca3	0.300	0.394	-0.094
Ca11	0.289	0.317	-0.028
Ca8	0.288	0.311	-0.023
Ca6	0.269	0.293	-0.024
Ca9	0.260	0.234	0.026
Ca10	0.252	0.297	-0.045
Ca12	0.158	0.118	0.040

A: Pearson correlation coefficient (r) of Ca-SCP1-SC model.

B: Pearson correlation coefficient (r) of Ca-SCP1-AR model.

C: Difference of absolute value of A and absolute value of B.

The data of the subcontractors indicate that causes do not have good linear correlation with SCP1 because all the r coefficients are below 0.5. Compared with the Ca-SCP1-AR model, ten out of twelve causes have lower r coefficients.

b. Selecting variables for Ca-SCP1-SC model

Eleven stage regression equations were generated. The Ca-SP1-SC-final regression equation consists of Ca2 and Ca4 only which are also the independent variables of the Ca-SP1-AR-final regression equation. Table 10.19 summarizes the standard and simple form regression equations of Ca-SP1-SC model.

Table 10.19: Regression equations of Ca-SCP1-SC model

Model	Regression equations
Ca-SCP1-SC -1	SCP1 = 1.743 + 0.044xCa1 + 0.284xCa2 – 0.102xCa3 - 0.020xCa4 + 0.102xCa5 - 0.066xCa6 + 0.203xCa7 - 0.007xCa8 + 0.025xCa9 + 0.084xCa10 + 0.007xCa11 + 0.019xCa12
Ca-SCP1-SC -final	SCP1 = 2.290 + 0.295xCa2 + 0.191xCa7

d. Explaining the variability of Ca-SCP1-SC model

Table 10.20 summarizes the R, R Square, Adjusted R Square F-statistic and Significance Level values of the eleven stage regression equations and all the eleven stage regression equations are only fairly good linearly correlated to SCP1 as their R values are all just slightly above 0.5. The R and R Square values for first five stage regression equations are the same. Thus, Ca4, Ca8, Ca11 and Ca12 are not essential to SCP1 according to the views from subcontractors.

Table 10.20: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP1-SC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP1-SC-1		0.526	0.277	0.194	3.323	0.000
Ca-SCP1-SC-2	Ca11	0.526	0.277	0.201	3.660	0.000
Ca-SCP1-SC-3	Ca8	0.526	0.277	0.209	4.064	0.000
Ca-SCP1-AC-4	Ca4	0.526	0.277	0.216	4.553	0.000
Ca-SCP1-SC-5	Ca12	0.526	0.277	0.223	5.160	0.000
Ca-SCP1-SC-6	Ca9	0.525	0.276	0.229	5.933	0.000
Ca-SCP1-SC-7	Ca1	0.524	0.274	0.235	6.932	0.000
Ca-SCP1-SC-8	Ca6	0.522	0.273	0.240	8.323	0.000
Ca-SCP1-SC-9	Ca5	0.518	0.269	0.243	10.286	0.000
Ca-SCP1-SC-10	Ca3	0.511	0.261	0.242	13.323	0.000
Ca-SCP1-SC-final	Ca10	0.500	0.250	0.237	19.008	0.000

10.6.3 Analysis for main contractor for SCP1 (Ca-SCP1-MC)

a. The correlation coefficients of Ca-SCP1-MC model

Fifty-five replies were from main contractors. Table 10.21 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP1-MC model in a descending order of priority and the comparison with the Ca-SCP1-AR model. The r coefficients range from 0.597 to -0.015. Ca12 have negative r coefficient. This is not in line with the general rule that score of the causes should be directly proportional to the score of problems. However, the influence of this cause to SCP1 can be neglected in the multiple regression analysis as its absolute r coefficient is very slow. Compared with the Ca-SCP1-AR model, the r coefficients of the causes are not consistent. The difference between the highest and lowest r coefficients is over 0.5.

Table 10.21: Correlation coefficient of Ca-SCP1-MC model

Variables	A	B	C
Ca2	0.597	0.540	0.057
Ca4	0.597	0.486	0.111
Ca1	0.595	0.462	0.133
Ca5	0.509	0.426	0.083
Ca3	0.474	0.394	0.080
Ca7	0.424	0.363	0.061
Ca9	0.329	0.234	0.095
Ca8	0.308	0.311	-0.003
Ca11	0.276	0.317	-0.041
Ca10	0.141	0.297	-0.156
Ca6	0.084	0.293	-0.209
Ca12	-0.015	0.118	-0.133

A: Pearson correlation coefficient (r) of Ca-SCP1-MC model.

B: Pearson correlation coefficient (r) of Ca-SCP1-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP1-MC model

.Eleven stage regression equations were generated. The Ca-SP1-SC-final regression equation consists of Ca1 and Ca4 only. Ca4 is one of the three independent variables of the Ca-SP1-AR-final regression equation. Table 10.22 summarizes the standard and simple form regression equations.

Table 10.22: Regression equations of Ca-SCP1-MC model

Model	Regression equations
Ca-SCP1-MC -1	SCP1 = 2.924 + 0.354xCa1 - 0.121xCa2 – 0.004xCa3 + 0.187xCa4 + 0.099xCa5 - 0.025xCa6 + 0.112xCa7 - 0.037xCa8 + 0.035xCa9 - 0.095xCa10 + 0.059xCa11 - 0.098xCa12
Ca-SCP1-MC -final	SCP1 = 2.398 + 0.267xCa1 + 0.251xCa4

c. Explaining the variability of Ca-SCP1-MC model

Table 10.23 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations. The stage regression equations are strongly linearly correlated to SCP1 as their R values range from 0.702 to 0.661. There is no difference in R values of first two stage regression equations. Ca3 have the lowest influence to SCP1 according to the views from main contractors.

Table 10.23: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP1-MC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP1-MC-1		0.702	0.493	0.348	3.397	0.002
Ca-SCP1-MC-2	Ca3	0.702	0.493	0.363	3.794	0.001
Ca-SCP1-MC-3	Ca9	0.701	0.492	0.377	4.261	0.000
Ca-SCP1-MC-4	Ca8	0.701	0.492	0.390	4.837	0.000
Ca-SCP1-MC-5	Ca11	0.699	0.489	0.400	5.507	0.000
Ca-SCP1-MC-6	Ca10	0.698	0.487	0.411	6.374	0.000
Ca-SCP1-MC-7	Ca2	0.695	0.483	0.419	7.488	0.000
Ca-SCP1-MC-8	Ca5	0.691	0.477	0.424	8.948	0.000
Ca-SCP1-MC-9	Ca7	0.684	0.468	0.425	10.976	0.000
Ca-SCP1-MC-10	Ca6	0.677	0.458	0.426	14.354	0.000
Ca-SCP1-MC-final	Ca12	0.661	0.437	0.416	20.206	0.000

10.6.4 Analysis for consultants/clients for SCP1 (Ca-SCP1-CC)

a. The correlation coefficients of Ca-SCP1-CC model

Twenty-five replies were from consultants/clients. Table 10.24 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP1-CC model in a descending order of priority and the comparison with the coefficients of the Ca-SCP1-AR model. The r coefficients of the causes decrease evenly from 0.755 to 0.399. Seven of them have r coefficient higher than 0.5. Compared with the Ca-SCP1-AR model, all causes except Ca5 have higher r coefficients.

Table 10.24: Correlation coefficient of Ca-SCP1-CC model

Variables	A	B	C
Ca2	0.755	0.540	0.215
Ca1	0.709	0.462	0.247
Ca10	0.662	0.297	0.365
Ca8	0.639	0.311	0.328
Ca4	0.619	0.486	0.133
Ca9	0.565	0.234	0.331
Ca11	0.564	0.317	0.247
Ca6	0.498	0.293	0.205
Ca3	0.471	0.394	0.077
Ca12	0.441	0.118	0.323
Ca5	0.371	0.426	-0.055
Ca7	0.399	0.363	0.036

A: Pearson correlation coefficient (r) of Ca-SCP1-CC model.

B: Pearson correlation coefficient (r) of Ca-SCP1-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP1-CC model

Eleven stage regression equations were generated. The Ca-SP1-CC-final regression equation consists of Ca2 and Ca8 only. Ca2 is one of the three independent variables included in the Ca-SP1-AR-final regression equation. Table 10.25 summarizes the standard and simple form regression equations.

Table 10.25: Regression equations of Ca-SCP1-CC model

Model	Regression equations
Ca-SCP1-CC -1	SCP1 = 0.755 - 0.041xCa1 + 0.445xCa2 – 0.145xCa3 + 0.220xCa4 - 0.185xCa5 + 0.153xCa6 - 0.039xCa7 + 0.185xCa8 + 0.138xCa9 - 0.033xCa10 + 0.046xCa11 - 0.032xCa12
Ca-SCP1-CC -final	SCP1 = 0.177 + 0.442xCa2 + 0.336xCa8

c. Explaining the variability of Ca-SCP1-CC model

Table 10.26summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations. The stage regression equations are very strongly linearly correlated to SCP1 as their R values are all over 0.8. The difference in R values for first five stage regression equations are the same. Ca1, Ca10, Ca11 and Ca12 are thus not essential causes to SCP1 according to the views from consultants/clients.

Table 10.26: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP1-CC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP1-CC-1		0.855	0.732	0.463	2.725	0.048
Ca-SCP1-CC-2	Ca1	0855	0.731	0.504	3.216	0.024
Ca-SCP1-CC-3	Ca10	0.855	0.721	0.539	3.803	0.012
Ca-SCP1-CC-4	Ca11	0.855	0.731	0.569	4.523	0.005
Ca-SCP1-CC-5	Ca12	0.855	0.731	0.596	5.426	0.002
Ca-SCP1-CC-6	Ca7	0.854	0.729	0.618	6.540	0.001
Ca-SCP1-CC-7	Ca9	0.848	0.718	0.625	7.653	0.000
Ca-SCP1-CC-8	Ca6	0.842	0.709	0.632	9.249	0.000
Ca-SCP1-CC-9	Ca4	0.835	0.697	0.637	11.507	0.000
Ca-SCP1-CC-10	Ca5	0.832	0.691	0.647	15.686	0.000
Ca-SCP1-CC-final	Ca3	0.825	0.681	0.652	23.494	0.000

10.6.5 Neural network analysis for Ca-SCP1 models

The neural network analysis results computed by the NeuroShell2 software for the causes to the SCP1 are summarized in the descending order of priority of their correlation coefficients in Table 10.27. All neural network outputs of the causes to SCP1 analysis have correlation coefficient higher than 0.5. The output of Ca-SCP1-CC-final has the highest correlation coefficient.

Table 10.27: Summary of neural network analysis for cause to SCP1

Neural network output	A	B	C	D
Ca-SCP1-CC -final	0.822	6	25	0.0027509
Ca-SCP1-MC -final	0.658	9	55	0.0291110
Ca-SCP1-MC -1	0.631	14	55	0.0332604
Ca-SCP1-AR -1	0.630	20	197	0.0096772
Ca-SCP1-CC -1	0.614	11	25	0.0039261
Ca-SCP1-AR -final	0.587	15	197	0.0097156
Ca-SCP1-SC -1	0.523	17	117	0.0031408
Ca-SCP1-SC -final	0.501	12	117	0.0033870

A: Correlation coefficient.

B: Number of hidden neurons.

C: Number of patterns processed.

D: Minimum error when the training was stopped.

10.6.6 Summary for analysis of the causes to SCP1

Table 10.28 compares the correlation coefficients computed by the multiple regression method and the neural network method for the different models of SCP1. All the models except Ca-SCP1-CC-1 have consistent correlation coefficients computed by the two methods and the maximum differences is only 0.071. The correlation coefficients of all the regression equations are above 0.5. Among them, regression equations for the main contractors and consultants/clients are quite reliable to explain the relationship between the contributions of the causes to the occurrence of the SCP1. Ca2 is the most essential cause among the twelve causes selected for the survey because it is only independent variable included in three out of the four simple form regression equations for SCP1. Ca4 and Ca7 are the second essential causes.

Table 10.28: Comparison of multiple regression method and neural network method for SCP1

Model	A	B	C	D
Ca-SCP1-AR -1	All	0.585	0.630	-0.045
Ca-SCP1-AR -final	Ca2, Ca4, Ca7	0.573	0.587	-0.014
Ca-SCP1-SC -1	All	0.526	0.523	0.003
Ca-SCP1-SC -final	Ca2, Ca7	0.500	0.501	-0.001
Ca-SCP1-MC -1	All	0.702	0.631	0.071
Ca-SCP1-MC -final	Ca1, Ca4	0.661	0.658	0.003
Ca-SCP1-CC -1	All	0.855	0.614	0.241
Ca-SCP1-CC -final	Ca2, Ca8	0.825	0.822	0.003

A: Independent variables included in the model

B: Correlation coefficient computed by multiple regression method

C: Correlation coefficient computed by neural network method

D: Difference of B and C

10.7 Analysis for SCP2

10.7.1 Analysis for all type of respondents for SCP2 (Ca-SCP2-AR)

a. Outliers

One extreme case was detected by adopting Mahalanobis statistical method and was deleted from the analysis. As a result, there were one hundred and ninety-six sets of data for the multiple regression analysis to SCP2.

a. Examining the variables of Ca-SCP2-AR model

Scatterplot matrix shown in Appendix T indicates that causes are fairly linearly related to site coordination problems, SCP2. Data transformation is not necessary.

c. Testing hypothesis for Ca-SCP2-AR model

The F-statistics for the regression analysis with all the twelve causes to site coordination problems, SCP2 is 7.108 and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is thus rejected and it can be concluded that there is at least one of the coefficients is not 0.

d. The correlation coefficients of Ca-SCP2-AR model

Table 10.29 summarizes the Pearson correlation coefficient (r) of the twelve causes of the site coordination problems to SCP2 in a descending order of priority. All causes have positive coefficient. The coefficients range from 0.505 to 0.103. Only Ca4 has r coefficient slightly higher than 0.5. The other causes do not have good linear correlation with SCP2.

Table 10.29: Correlation coefficient of Ca-SCP2-AR model

Variables	Pearson correlation coefficient (r)
Ca4	0.505
Ca5	0.486
Ca2	0.432
Ca3	0.418
Ca10	0.387
Ca1	0.352
Ca11	0.318
Ca6	0.314
Ca8	0.306
Ca7	0.278
Ca9	0.209
Ca12	0.103

e. Selecting variables for Ca-SCP2-AR model

Ten stage regression equations were generated in the analysis. The Ca-SCP2-AR-final regression equation consists of three variables, Ca4, Ca5 and Ca10. Table 10.30 shows the details of the standard form and simple form regression equations of Ca-SCP2-AR model.

Table 10.30: Regression equations of Ca-SCP2-AR model

Model	Regression equations
Ca-SCP2-AR-1	SCP2 = 1.187 – 0.007xCa1 + 0.046xCa2 + 0.081xCa3 + 0.122xCa4 + 0.133xCa5 + 0.010xCa6 + 0.011xCa7 + 0.050xCa8 - 0.050xCa9 + 0.141xCa10 + 0.055xCa11 - 0.068xCa12
Ca-SCP2-AR -final	SCP2 = 1.844 + 0.199xCa4+ 0.169xCa5 + 0.140xCa10

f. Explaining the variability of Ca-SCP2-AR model

Table 10.31 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations of Ca-SCP2-AR model.

Table 10.31: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP2-AR model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP2-AR-1		0.570	0.324	0.280	7.324	0.000
Ca-SCP2-AR-2	Ca1	0.570	0.324	0.284	8.032	0.000
Ca-SCP2-AR-3	Ca6	0.570	0.324	0.288	8.880	0.000
Ca-SCP2-AR-4	Ca7	0.569	0.324	0.291	9.912	0.000
Ca-SCP2-AR-5	Ca2	0.568	0.323	0.294	11.145	0.000
Ca-SCP2-AR-6	Ca9	0.566	0.320	0.295	12.664	0.000
Ca-SCP2-AR-7	Ca11	0.565	0.319	0.298	14.770	0.000
Ca-SCP2-AR-8	Ca8	0.562	0.315	0.297	17.507	0.000
Ca-SCP2-AR-9	Ca12	0.559	0.312	0.298	21.669	0.000
Ca-SCP2-AR-final	Ca3	0.552	0.304	0.293	28.003	0.000

The ten stage regression equations are only fairly good linearly correlated to SCP2 as their R values range from 0.570 to 0.552. The R values for first three stage equations are the same. This indicates that Ca1 and Ca6 are not essential to SCP2.

10.7.2 Analysis for subcontractors for SCP2 (Ca-SCP2-SC)

a. The correlation coefficients of Ca-SCP2-SC model

The Pearson correlation coefficients (r) of the twelve causes of Ca-SCP2-SC in a descending order of priority and the comparison with the Ca-SCP2-AR model have been presented in Table 10.32.

Table 10.32: Correlation coefficient of Ca-SCP2-SC model

Variables	A	B	C
Ca5	0.387	0.486	-0.099
Ca10	0.385	0.387	-0.002
Ca4	0.384	0.505	-0.121
Ca3	0.364	0.418	-0.054
Ca9	0.364	0.209	0.155
Ca11	0.353	0.318	0.035
Ca8	0.345	0.306	0.039
Ca6	0.327	0.314	0.013
Ca7	0.308	0.278	0.030
Ca2	0.300	0.432	-0.132
Ca1	0.252	0.352	-0.100
Ca12	0.181	0.103	0.078

A: Pearson correlation coefficient (r) of Ca-SCP2-SC model.

B: Pearson correlation coefficient (r) of Ca-SCP2-AR model.

C: Difference of absolute value of A and absolute value of B.

According to the subcontractors' data, all the causes are only fairly linearly correlation with SCP2 as the r coefficients range from 0.387 to 0.181. Compared with the Ca-SCP2-AR model, the r coefficient of the causes are more consistent. The difference between the highest and lowest r coefficients of Ca-SCP2-SC is only 0.206.

b. Selecting variables for Ca-SCP2-SC model

Ten stage regression equations were generated in the analysis. The Ca-SP2-SC-final regression equation consists of Ca4, Ca8 and Ca10. Ca4 and Ca10 are also the independent variables of the Ca-SP2-AR-final regression equation. Table 10.33 summarizes the details of the standard form and simple form regression equations.

Table 10.33: Regression equations of Ca-SCP2-SC model

Model	Regression equations
Ca-SCP2-SC-1	SCP2 = 0.964 - 0.065xCa1 + 0.036xCa2 + 0.057xCa3 + 0.060xCa4 + 0.082xCa5 + 0.011xCa6 + 0.069xCa7 + 0.105xCa8 + 0.080xCa9 + 0.164xCa10 + 0.026xCa11 - 0.028xCa12
Ca-SCP2-SC-final	SCP2 = 1.242 + 0.174xCa4 + 0.163xCa8 + 0.210xCa10

c. Explaining the variability of Ca-SCP2-SC model

Table 10.34 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations. The R values of the stage regression equations range from 0.511 to 0.478. Only the first seven stage regression equation have

R value higher than 0.5. The R values for first three stage regression equations are the same. Thus Ca6 and Ca11 are not essential to SCP2 according to the views from subcontractors.

Table 10.34: R, R Square, Adjusted R Square F-statistic and Significance Level values of the stage regression equations of Ca-SCP2-SC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP2-SC-1		0.511	0.262	0.176	3.070	0.001
Ca-SCP2-SC-2	Ca6	0.511	0.262	0.184	3.380	0.000
Ca-SCP2-SC-3	Ca11	0.511	0.261	0.191	3.745	0.000
Ca-SCP2-AC-4	Ca12	0.510	0.260	0.198	4.187	0.000
Ca-SCP2-SC-5	Ca2	0.509	0.259	0.204	4.725	0.000
Ca-SCP2-SC-6	Ca1	0.507	0.257	0.209	5.388	0.000
Ca-SCP2-SC-7	Ca3	0.505	0.255	0.214	6.268	0.000
Ca-SCP2-SC-8	Ca5	0.499	0.249	0.215	7.359	0.000
Ca-SCP2-SC-9	Ca9	0.490	0.240	0.213	8.856	0.000
Ca-SCP2-SC-final	Ca7	0.478	0.229	0.208	11.171	0.000

10.7.3 Analysis for main contractor for SCP2 (Ca-SCP2-MC)

a. The correlation coefficients of Ca-SCP2-MC model

Table 10.35 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP2-MC modal in a descending order of priority and the comparison with the Ca-SCP2-AR model. All causes except Ca6 and Ca12 have positive r coefficients. These two causes should have no essential influence in the multiple regression analysis as their absolute r coefficient is very low. The r coefficient of the causes gradually decreases from 0.489 to 0.196. Only three causes have r coefficient slightly higher than 0.5. Compared with the Ca-SCP2-AR model, there is a bigger difference between highest and lowest r coefficients.

Table 10.35: Correlation coefficient of Ca-SCP2-MC model

Variables	A	B	C
Ca5	0.585	0.486	0.099
Ca4	0.573	0.505	0.068
Ca1	0.508	0.352	0.156
Ca2	0.489	0.432	0.057
Ca3	0.458	0.418	0.040
Ca9	0.315	0.209	0.106
Ca7	0.303	0.278	0.025
Ca11	0.303	0.318	-0.015
Ca8	0.259	0.306	-0.047
Ca10	0.196	0.387	-0.191
Ca6	-0.028	0.314	-0.342
Ca12	-0.054	0.103	-0.157

A: Pearson correlation coefficient (r) of Ca-SCP2-MC model.

B: Pearson correlation coefficient (r) of Ca-SCP2-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP2-MC model

Nine stage regression equations were generated. Ca1, Ca5, Ca6 and Ca12 are remained in the Ca-SP2-SC-final regression equation and none of them are common independent variable of the Ca-SP2-AR-final regression equation. Table 10.36 summarizes the details of the standard and simple form regression equations.

Table 10.36: Regression equations of Ca-SCP2-MC model

Model	Regression equations
Ca-SCP2-MC-1	SCP2 = 2.939 + 0.392xCa1 - 0.319xCa2 + 0.013xCa3 + 0.152xCa4 + 0.258xCa5 - 0.042xCa6 + 0.029xCa7 - 0.055xCa8 + 0.057xCa9 + 0.003xCa10 + 0.114xCa11 - 0.190xCa12
Ca-SCP2-MC-final	SCP2 = 2.957 + 0.232xCa1 + 0.333xCa5 - 0.038xCa6 -0.136xCa12

c. Explaining the variability of Ca-SCP2-MC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the nine stage regression equations have been summarized in Table 10.37. All the regression equations have good linear correlation with SCP2. Their R values ranges from 0.729 to 0.692. The R and R Square values for first three stage regression equations are the same. Ca3 and Ca10 are regarded as non-essential causes to SCP2 according to the views from main contractors.

Table 10.37: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP2-MC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP2-MC-1		0.729	0.532	0.398	3.975	0.000
Ca-SCP2-MC-2	Ca10	0.729	0.532	0.412	4.440	0.000
Ca-SCP2-MC-3	Ca3	0.729	0.532	0.425	4.994	0.000
Ca-SCP2-MC-4	Ca7	0.728	0.531	0.437	5.654	0.000
Ca-SCP2-MC-5	Ca8	0.728	0.530	0.448	6.489	0.000
Ca-SCP2-MC-6	Ca9	0.727	0.529	0.459	7.544	0.000
Ca-SCP2-MC-7	Ca4	0.714	0.510	0.448	8.319	0.000
Ca-SCP2-MC-8	Ca2	0.702	0.493	0.441	9.526	0.000
Ca-SCP2-MC-final	Ca11	0.692	0.479	0.438	11.505	0.000

10.7.4 Analysis for main contractor for SCP2 (Ca-SCP2-CC)

a. The correlation coefficients of Ca-SCP2-CC model

Table 10.38 summarizes the Pearson correlation coefficient (r) of the twelve causes of the Ca-SCP2-CC model in a descending order of priority and the comparison with Ca-SCP2-AR model. All causes have positive coefficient. The r coefficients range from 0.755 to 0.417. Seven of them have r coefficient higher than 0.5. Ca8 and Ca2 are strongly linearly correlated to SCP2 as their r coefficients are over 0.7. Compared with Ca-SCP2-AR model, all except Ca5 have higher r coefficients.

Table 10.38: Correlation coefficient of Ca-SCP2-CC model

Variables	A	B	C
Ca8	0.755	0.306	0.449
Ca2	0.708	0.432	0.276
Ca1	0.679	0.352	0.327
Ca9	0.635	0.209	0.426
Ca10	0.573	0.387	0.186
Ca4	0.559	0.505	0.054
Ca11	0.525	0.318	0.207
Ca3	0.489	0.418	0.071
Ca6	0.463	0.314	0.149
Ca7	0.462	0.278	0.184
Ca5	0.434	0.486	-0.052
Ca12	0.417	0.103	0.314

A: Pearson correlation coefficient (r) of Ca-SCP2-CC model

B: Pearson correlation coefficient (r) of Ca-SCP2-AR model

C: Difference of absolute value of A and absolute value of B

b. Selecting variables for Ca-SCP2-CC model

Eleven stage regression equations were generated in the analysis. Ca-SP2-SC-final regression equation consists of Ca2 and Ca8 and none of them are common independent variable of the Ca-SP2-AR-final regression equation. Table 10.39 summarizes the details of the standard and simple form regression equations.

Table 10.39: Regression equations of Ca-SCP2-CC model

Model	Regression equations
Ca-SCP2-CC -1	SCP2 = 0.054 + 0.066xCa1 + 0.412xCa2 – 0.163xCa3 - 0.146xCa4 + 0.237xCa5 - 0.080xCa6 + 0.098xCa7 + 0.492xCa8 + 0.158xCa9 - 0.300xCa10 + 0.079xCa11 + 0.0004xCa12
Ca-SCP2-CC -final	SCP2 = 0.183 + 0.328xCa2 + 0.463xCa8

c. Explaining the variability of Ca-SCP2-CC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations have been summarized in Table 10.40. All the regression equations are very strongly linearly correlated to SCP2. Their R values ranges from 0.908 to 0.860. The R and R Square values for first three stage regression equations are the same. Ca1 and Ca12 can thus be eliminated without causing significant influence to SCP2 according to the views from consultants/clients.

Table 10.40: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP2-CC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP2-CC-1		0.908	0.824	0.649	4.696	0.006
Ca-SCP2-CC-2	Ca12	0.908	0.824	0.676	5.549	0.002
Ca-SCP2-CC-3	Ca1	0.908	0.824	0.698	6.538	0.001
Ca-SCP2-CC-4	Ca4	0.905	0.820	0.712	7.586	0.000
Ca-SCP2-CC-5	Ca11	0.905	0.818	0.727	8.983	0.000
Ca-SCP2-CC-6	Ca6	0.904	0.817	0.741	10.807	0.000
Ca-SCP2-CC-7	Ca7	0.901	0.812	0.749	12.916	0.000
Ca-SCP2-CC-8	Ca5	0.890	0.792	0.737	14.435	0.000
Ca-SCP2-CC-9	Ca3	0.880	0.779	0.730	17.231	0.000
Ca-SCP2-CC-10	Ca9	0.868	0.754	0.719	21.459	0.000
Ca-SCP2-CC-final	Ca10	0.860	0.740	0.716	31.243	0.000

10.7.5 Neural network analysis for Ca-SCP2 models

The neural network analysis results computed by NeuroShell2 software for the analysis of causes to the SCP2 are summarized in the descending order of priority of their correlation coefficients in Table 10.41. The correlation coefficients of the outputs range from 0.849 to 0.471.

Table 10.41: Neural network analysis for Ca-SCP2 models

Neural network output	A	B	C	D
Ca-SCP2-CC -final	0.849	6	25	0.0004377
Ca-SCP2-MC -1	0.814	14	55	0.0135964
Ca-SCP2-MC -final	0.741	10	55	0.0109814
Ca-SCP2-CC -1	0.602	11	25	0.0004394
Ca-SCP2-AR -final	0.542	15	197	0.0114755
Ca-SCP2-SC -1	0.492	17	117	0.0051638
Ca-SCP2-AR -1	0.490	20	197	0.0117110
Ca-SCP2-SC -final	0.471	12	117	0.0071031

A: Correlation coefficient

B: Number of hidden neurons

C: Number of patterns processed

D: Minimum error when the training was stopped

10.7.6 Summary for analysis of the causes to SCP2 analysis

Table 10.42 compares the correlation coefficients computed by multiple regression method and neural network method for the different models of SCP2. All the correlation coefficients of the model except Ca-SCP2-CC-1 computed by these two methods are quite consistent and the maximum differences is only 0.085. The regression equations for data from consultants/clients and main contractors are good to explain the relationship for the contributions of the causes to the occurrence of the SCP2. Ca4, Ca8 and Ca10 are equally essential among the twelve causes selected for the survey because they are included in two out of the four simple form regression equations for SCP2.

Table 10.42: Comparison of multiple regression method and neural network method for SCP2

Model	A	B	C	D
Ca-SCP2-CC -1	All	0.908	0.602	0.306
Ca-SCP2-CC -final	Ca2, Ca8	0.860	0.849	0.011
Ca-SCP2-MC -1	All	0.729	0.814	-0.085
Ca-SCP2-MC -final	Ca1, Ca5, Ca6, Ca12	0.692	0.741	-0.049
Ca-SCP2-AR -1	All	0.570	0.490	0.080
Ca-SCP2-AR -final	Ca4, Ca5, Ca10	0.552	0.542	0.010
Ca-SCP2-SC -1	All	0.511	0.492	0.019
Ca-SCP2-SC -final	Ca4, Ca8, Ca10	0.478	0.471	0.007

A: Independent variables included in the model

B: Correlation coefficient computed by multiple regression method

C: Correlation coefficient computed by neural network method

D: Difference of B and C

10.8 Analysis for SCP3

10.8.1 Analysis for all type of respondents (Ca-SCP3-AR)

a. Outliers

One extreme case was identified by Mahalanobis statistical statistical method and it was deleted from data. One hundred and ninety-six sets of data were included for the multiple regression analysis for SCP3.

b. Examining the variables of Ca-SCP3-AR model

The scatterplot matrix shown in Appendix T indicates that the causes are approximately linearly correlated to SCP3 based on visual examination of the data. As a result, there is no need to conduct data transformation for the multiple regression analysis.

c. Testing hypothesis for Ca-SCP3-AR model

The F-statistics for the multiple regression analysis with all the twelve causes to site coordination problem, SCP3 is 7.108 and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is thus rejected and it can be concluded that there is at least one of the coefficients is not 0.

d. The correlation coefficients of Ca-SCP3-AR model

Table 10.43 summarizes the Pearson correlation coefficient (r) of the twelve causes of the site coordination problems to SCP3 in a descending order of priority. All causes have positive coefficients which range from 0.410 to 0.199. As all the r coefficients are below 0.5, the causes are only fairly linearly correlated to SCP3.

Table 10.43: Correlation coefficient of Ca-SCP3-AR model

Variables	Pearson correlation coefficient (r)
Ca4	0.410
Ca2	0.406
Ca3	0.401
Ca5	0.380
Ca8	0.322
Ca1	0.318
Ca10	0.306
Ca7	0.291
Ca6	0.259
Ca11	0.282
Ca9	0.222
Ca12	0.199

e. Selecting variables for Ca-SCP3-AR model

Ten stage regression equations were generated in the analysis. The Ca-SCP3-AR-final regression equation consists of three variables, Ca2, Ca3 and Ca8. Table 10.44 summarizes the details of the standard form and simple form regression equations of Ca-SCP3-AR model.

Table 10.44: Regression equations of Ca-SCP3-AR model

Model	Regression equations
Ca-SCP3-AR-1	SCP2 = 2.182 – 0.063xCa1 + 0.147xCa2 + 0.115xCa3 + 0.053xCa4 + 0.090xCa5 - 0.055xCa6 + 0.045xCa7 + 0.093xCa8 - 0.019xCa9 + 0.069xCa10 - 0.033xCa11 + 0.068xCa12
Ca-SCP3-AR-final	SCP2 = 2.562 + 0.153xCa2+ 0.162xCa3 + 0.119xCa8

f. Explaining the variability of Ca-SCP3-AR model

Table 10.45 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations of Ca-SCP3-AR model .

Table 10.45: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP3-AR model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP-AR-1		0.498	0.248	0.199	5.040	0.000
Ca-SCP3-AR-2	Ca9	0.498	0.248	0.203	5.518	0.000
Ca-SCP3-AR-3	Ca11	0.497	0.247	0.206	6.062	0.000
Ca-SCP3-AR-4	Ca4	0.495	0.245	0.209	6.723	0.000
Ca-SCP3-AR-5	Ca7	0.494	0.244	0.211	7.526	0.000
Ca-SCP3-AR-6	Ca6	0.492	0.242	0.214	8.570	0.000
Ca-SCP3-AR-7	Ca10	0.488	0.238	0.214	9.851	0.000
Ca-SCP3-AR-8	Ca1	0.483	0.234	0.213	11.581	0.000
Ca-SCP3-AR-9	Ca12	0.478	0.228	0.212	14.123	0.000
Ca-SCP3-AR-final	Ca5	0.466	0.217	0.205	17.778	0.000

The ten stage regression equations are only fairly linearly correlated to SCP3 as all the R values of these models are below 0.5. The R values for first two stage equations are the same. This indicates that Ca9 is not essential to SCP3.

10.8.2 Analysis for subcontractors for SCP3 (Ca-SCP3-SC)

a. The correlation coefficients of Ca-SCP3-SC model

The Pearson correlation coefficients (r) of the twelve causes of Ca-SCP3-SC model, in a descending order of priority, and the comparison with Ca-SCP2-AR model are shown in Table 10.46.

Table 10.46: Correlation coefficient of Ca-SCP3-SC model

Variables	A	B	C
Ca2	0.351	0.406	-0.055
Ca5	0.336	0.380	-0.044
Ca4	0.323	0.410	-0.087
Ca3	0.320	0.401	-0.081
Ca1	0.306	0.318	-0.012
Ca9	0.289	0.222	0.067
Ca8	0.286	0.322	-0.036
Ca6	0.273	0.259	0.014
Ca7	0.267	0.291	-0.024
Ca10	0.234	0.306	-0.072
Ca11	0.228	0.282	-0.054
Ca12	0.210	0.199	0.011

A: Pearson correlation coefficient (r) of Ca-SCP3-SC model.

B: Pearson correlation coefficient (r) of Ca-SCP3-AR model.

C: Difference of absolute value of A and absolute value of B.

According to the subcontractors' data, all the causes are only slightly linearly correlated with SCP3 because all the r coefficients are below 0.04. The r coefficient of the causes of Ca-SCP3-AR model and Ca-SCP3-SC model are consistent. The biggest difference in r coefficient of these two models is only 0.072.

b. Selecting variables for Ca-SCP3-SC model

Eleven stage regression equations were generated in the analysis. The Ca-SP3-SC-final regression equation consists of Ca2 and Ca5. Ca2 is one of the three independent variables of Ca-SP3-AR-final regression equation. Table 10.47 summarizes the details of the standard form and simple form regression equations of Ca-SCP3-SC model.

Table 10.47: Regression equations of Ca-SCP3-SC model

Model	Regression equations
Ca-SCP3-SC-1	SCP3 = 1.531 + 0.020xCa1 + 0.146xCa2 + 0.021xCa3 + 0.055xCa4 + 0.113xCa5 - 0.051xCa6 + 0.070xCa7 + 0.052xCa8 + 0.104xCa9 + 0.019xCa10 - 0.082xCa11 + 0.094xCa12
Ca-SCP3-SC-final	SCP3 = 2.708 + 0.207xCa2 + 0.188xCa5

c. Explaining the variability of Ca-SCP3-SC model

Table 10.48 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations of Ca-SCP3-SC model. All the stage regression equations are only fairly linearly correlated to SCP3 as the R values of these models are below 0.5. The R values for first four stage regression equations are the same and the different between Ca-SCP3-SC-4 equation and Ca-SCP3-SC-5 equation is only 0.002. Ca1, Ca3 and Ca10 are thus not essential to SCP3 according to the views from subcontractors.

Table 10.48: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP3-SC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP3-SC-1		0.443	0.197	0.104	2.121	0.021
Ca-SCP3-SC-2	Ca10	0.443	0.197	0.112	2.335	0.013
Ca-SCP3-SC-3	Ca1	0.443	0.196	0.120	2.589	0.008
Ca-SCP3-SC-4	Ca3	0.443	0.196	0.128	2.899	0.004
Ca-SCP3-SC-5	Ca6	0.441	0.195	0.135	3.266	0.002
Ca-SCP3-SC-6	Ca8	0.439	0.193	0.141	3.723	0.001
Ca-SCP3-SC-7	Ca4	0.437	0.191	0.147	4.322	0.000
Ca-SCP3-SC-8	Ca11	0.434	0.188	0.152	5.156	0.000
Ca-SCP3-SC-9	Ca7	0.429	0.184	0.155	6.319	0.000
Ca-SCP3-SC-10	Ca9	0.417	0.174	0.152	7.951	0.000
Ca-SCP3-SC-final	Ca12	0.395	0.156	0.141	10.518	0.000

10.8.3 Analysis for main contractor for SCP3 (Ca-SCP3-MC)

a. The correlation coefficients of Ca-SCP3-MC model

Table 10.49 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP3-MC model in a descending order of priority and the comparison with the Ca-

SCP3-AR model. All causes except Ca6 have positive r coefficients and the values range from 0.437 to -0.098. The absolute value of r coefficient of Ca6 is only 0.098. This cause should thus have no significant influence in the multiple regression analysis. Compared with the Ca-SCP3-AR model, there is a bigger difference between highest and lowest r coefficients.

Table 10.49: Correlation coefficient of Ca-SCP3-MC model

Variables	A	B	C
Ca3	0.437	0.401	0.036
Ca9	0.431	0.222	0.209
Ca4	0.411	0.410	0.001
Ca7	0.380	0.291	0.089
Ca2	0.367	0.406	-0.039
Ca5	0.366	0.380	-0.014
Ca8	0.364	0.322	0.042
Ca11	0.333	0.282	0.051
Ca1	0.327	0.318	0.009
Ca10	0.265	0.306	-0.041
Ca12	0.072	0.199	-0.127
Ca6	-0.098	0.259	-0.357

A: Pearson correlation coefficient (r) of Ca-SCP3-MC model

B: Pearson correlation coefficient (r) of Ca-SCP3-AR model

C: Difference of absolute value of A and absolute value of B

b. Selecting variables for Ca-SCP3-MC model

Ten stage regression equations were generated in the analysis. Ca3, Ca6 and Ca9 remained in the Ca-SP3-SC-final regression equation and Ca3 is a common independent variable of Ca-SP3-AR-final regression equation. Table 10.50 summarizes the details of the standard form and simple form regression equations. As the partial coefficient of Ca6 of the Ca-SCP3-MC-final equation is of negative value, Ca6 should not be considered in the analysis on the essential causes to SCP3.

Table 10.50: Regression equations of Ca-SCP3-MC model

Model	Regression equations
Ca-SCP3-MC-1	SCP3 = 3.454 + 0.104xCa1 - 0.193xCa2 + 0.157xCa3 + 0.070xCa4 + 0.054xCa5 - 0.043xCa6 + 0.102xCa7 - 0.003xCa8 + 0.203xCa9 - 0.028xCa10 + 0.0004xCa11 - 0.047xCa12
Ca-SCP3-MC-final	SCP3 = 3.318 + 0.213xCa3 - 0.033xCa6 + 0.206xCa9

c. Explaining the variability of Ca-SCP3-MC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations have been summarized in Table 10.51. The stage regression equations are fairly good linearly correlated to SCP3. Their R values ranges from 0.611 to 0.573. The R values for first three stage regression equations are the same. Ca8 and Ca11 are thus not essential to SCP3 according to the views from main contractors.

Table 10.51: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP3-MC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP3-MC-1		0.611	0.373	0.194	2.086	0.040
Ca-SCP3-MC-2	Ca11	0.611	0.373	0.213	2.329	0.024
Ca-SCP3-MC-3	Ca8	0.611	0.373	0.231	2.622	0.014
Ca-SCP3-MC-4	Ca10	0.610	0.373	0.247	2.970	0.007
Ca-SCP3-MC-5	Ca5	0.608	0.370	0.260	3.378	0.004
Ca-SCP3-MC-6	Ca12	0.604	0.365	0.270	3.855	0.002
Ca-SCP3-MC-7	Ca1	0.601	0.361	0.281	4.518	0.001
Ca-SCP3-MC-8	Ca2	0.593	0.351	0.285	5.303	0.001
Ca-SCP3-MC-9	Ca4	0.588	0.346	0.293	6.600	0.000
Ca-SCP3-MC-final	Ca7	0.573	0.329	0.289	8.320	0.000

10.8.4 Analysis for main contractor for SCP3 (Ca-SCP3-CC)

a. The correlation coefficients of Ca-SCP3-CC model

Table 10.52 summarizes the Pearson correlation coefficient (r) of the twelve causes of the Ca-SCP3-CC model in a descending order of priority and the comparison with Ca-SCP3-AR model. All causes have positive r coefficients and they range from 0.707 to 0.347. Seven out of the twelve causes have r coefficient higher than 0.5. Compared with Ca-SCP2-AR model, all causes except Ca5 have higher r coefficients.

Table 10.52: Correlation coefficient of Ca-SCP3-CC model

Variables	A	B	C
Ca8	0.707	0.322	0.385
Ca2	0.603	0.406	0.197
Ca12	0.595	0.199	0.396
Ca1	0.553	0.318	0.235
Ca11	0.520	0.282	0.238
Ca9	0.516	0.222	0.294
Ca3	0.515	0.401	0.114
Ca4	0.491	0.410	0.081
Ca6	0.462	0.259	0.203
Ca10	0.440	0.306	0.134
Ca7	0.433	0.291	0.142
Ca5	0.347	0.380	-0.033

A: Pearson correlation coefficient (r) of Ca-SCP3-CCodel

B: Pearson correlation coefficient (r) of Ca-SCP3-AR model

C: Difference of absolute value of A and absolute value of B

b. Selecting variables for Ca-SCP3-CC model

Nine stage regression equations were generated in the analysis. Ca-SP3-SC-final regression equation comprised Ca2, Ca8, Ca10 and Ca12. Ca2 and Ca8 are common independent variables of the Ca-SP3-AR-final regression equation. Table 10.53

summarizes the details of the standard form and simple form regression equations. As the partial coefficient of Ca10 of the Ca-SCP3-CC-final equation is of negative value, Ca10 should not be considered in the analysis on the essential causes to SCP3.

Table 10.53: Regression equations of Ca-SCP3-CC model

Model	Regression equations
Ca-SCP3-CC-1	SCP3 = -0.216 - 0.131xCa1 + 0.289xCa2 – 0.040xCa3 + 0.064xCa4 + 0.262xCa5 - 0.040xCa6 + 0.025xCa7 + 0.426xCa8 + 0.223xCa9 - 0.324xCa10 - 0.197xCa11 + 0.404xCa12
Ca-SCP3-CC-final	SCP3 = 0.700 + 0.356xCa2 + 0.527xCa8 - 0.283xCa10 + 0.195xCa12

c. Explaining the variability of Ca-SCP3-CC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the nine stage regression equations have been summarized in Table 10.54. All the regression equations are very strongly linearly correlated to SCP3. Their R values ranges from 0.872 to 0.840. The R values for first four stage regression equations are the same. Ca3, Ca4 and Ca7 are non-essential causes to SCP3 from the views of consultants/clients.

Table 10.54: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP3-CC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP3-CC-1		0.872	0.761	0.522	3.187	0.028
Ca-SCP3-CC-2	Ca7	0.872	0.761	0.558	3.759	0.013
Ca-SCP3-CC-3	Ca3	0.872	0.760	0.589	4.438	0.006
Ca-SCP3-CC-4	Ca4	0.872	0.760	0.616	5.274	0.002
Ca-SCP3-CC-5	Ca6	0.871	0.759	0.638	6.284	0.001
Ca-SCP3-CC-6	Ca1	0.869	0.756	0.656	7.524	0.000
Ca-SCP3-CC-7	Ca11	0.862	0.743	0.658	8.687	0.000
Ca-SCP3-CC-8	Ca9	0.853	0.728	0.657	10.190	0.000
Ca-SCP3-CC-final	Ca5	0.840	0.706	0.647	11.984	0.000

10.8.5 Neural network analysis for Ca-SCP3 models

The neural network analysis results computed by NeuroShell2 software for the causes of the SCP3 are summarized in the descending order of priority of their correlation coefficients in Table 10.55. The correlation coefficients of the neural network outputs range from 0.751 to 0.396. The first two highest correlation coefficients are from data consultants/clients' data while the lowest two are from the data of subcontractors.

Table 10.55: Neural network analysis for Ca-SCP3 models

Neural network output	A	B	C	D
Ca-SCP3-CC-final	0.751	7	25	0.0003079
Ca-SCP3-CC-1	0.745	11	25	0.0000132
Ca-SCP3-AR-1	0.686	20	197	0.0094536
Ca-SCP3-MC-final	0.571	9	55	0.0011292
Ca-SCP3-MC-1	0.569	14	55	0.0016370
Ca-SCP3-AR-final	0.490	15	197	0.0109852
Ca-SCP3-SC-1	0.435	17	117	0.0060636
Ca-SCP3-SC-final	0.396	12	117	0.0062016

A: Correlation coefficient

B: Number of hidden neurons

C: Number of patterns processed

D: Minimum error when the training was stopped

10.8.6 Summary for the analysis of the causes to SCP3

Table 10.56 compares the correlation coefficients computed by multiple regression method and neural network method for the different models of SCP3. Except Ca-SCP3-AR-1 and Ca-SCP3-CC-1, all the models have consistent correlation coefficients computed by the two methods and the maximum differences is only 0.089. The regression equations for the consultants/clients' data and main contractors are quite reliable to explain the relationship of the contributions of the causes to SCP3. Ca2 is the most essential cause as it is included in three out of the four simple form regression equations. Ca3 and Ca8 are the second most essential causes as they are included in two simple form regression equations.

Table 10.56: Comparison of multiple regression method and neural network method for SCP3

Model	A	B	C	D
Ca-SCP3-AR-1	All	0.498	0.686	-0.188
Ca-SCP3-AR-final	Ca2, Ca3, Ca8	0.466	0.490	-0.024
Ca-SCP3-SC-1	All	0.443	0.435	0.008
Ca-SCP3-S -final	Ca2, Ca5	0.395	0.396	-0.001
Ca-SCP3-MC-1	All	0.611	0.569	0.042
Ca-SCP3-MC-final	Ca3, Ca9	0.573	0.571	0.002
Ca-SCP3-CC-1	All	0.872	0.745	0.127
Ca-SCP3-CC-final	Ca2, Ca8, Ca12	0.840	0.751	0.089

A: Independent variables with positive partial coefficient included in the regression equation.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network method.

D: Difference of B and C.

10.9 Analysis for SCP4

10.9.1 Analysis for all type of respondents for SCP4 (Ca-SCP4-AR)

a. Outliers

No extreme case was detected by the Mahalanobis statistical method. As a result, one hundred and ninety-seven sets of data were included in the multiple regression analysis of causes to SCP4.

a. Examining the variables of Ca-SCP4-AR model

The scatterplot matrix shown in Appendix T indicates that the causes are approximately linearly correlated to SCP4 based on visual examination of the data. Data transformation is thus not necessary for the multiple regression analysis.

c. Testing hypothesis for Ca-SCP4-AR model

The F-statistics for the regression with all the twelve causes to site coordination problem, SCP4 is 4.305 and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is thus rejected and there is at least one of the coefficients is not 0.

d. The correlation coefficients of Ca-SCP4-AR model

Table 10.57 summarizes the Pearson correlation coefficient (r) of the twelve causes to the site coordination problems, SCP4 in a descending order of priority. All causes have positive coefficient. The r coefficients range from 0.358 to 0.190. The causes are thus only very fairly linearly correlated to SCP4.

Table 10.57: Correlation coefficient of Ca-SCP4-AR model

Variables	Pearson correlation coefficient (r)
Ca7	0.358
Ca9	0.350
Ca11	0.345
Ca3	0.339
Ca8	0.330
Ca4	0.314
Ca2	0.309
Ca1	0.291
Ca5	0.283
Ca10	0.265
Ca6	0.213
Ca12	0.190

e. Selecting variables for Ca-SCP4-AR model

Ten stage regression equations were generated in the analysis. The Ca-SCP4-AR-final regression equation consists of Ca5, Ca7 and Ca9. Table 10.58 summarizes the details of the standard form and simple form regression equations of Ca-SCP4-AR model.

Table 10.58: Regression equations of Ca-SCP4-AR model

Model	Regression equations
Ca-SCP4-AR-1	SCP4 = 3.022 + 0.005xCa1 + 0.041xCa2 + 0.078xCa3 - 0.002xCa4 + 0.095xCa5 - 0.093xCa6 + 0.138xCa7 + 0.005xCa8 + 0.110xCa9 + 0.023xCa10 + 0.037xCa11 + 0.031xCa12
Ca-SCP4-AR-final	SCP4 = 3.271 + 0.129xCa5+ 0.151xCa7 + 0.149xCa9

f. Explaining the variability of Ca-SCP4-AR model

Table 10.59 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations of Ca-SCP4-AR model.

Table 10.59: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP4-AR model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP34-AR-1		0.468	0.219	0.168	4.305	0.000
Ca-SCP4-AR-2	Ca4	0.468	0.219	0.173	4.722	0.000
Ca-SCP4-AR-3	Ca1	0.468	0.219	0.177	5.222	0.000
Ca-SCP4-AR-4	Ca8	0.468	0.219	0.182	5.832	0.000
Ca-SCP4-AR-5	Ca10	0.468	0.219	0.186	6.581	0.000
Ca-SCP4-AR-6	Ca12	0.466	0.217	0.188	7.492	0.000
Ca-SCP4-AR-7	Ca2	0.465	0.216	0.191	8.712	0.000
Ca-SCP4-AR-8	Ca11	0.465	0.212	0.191	10.266	0.000
Ca-SCP4-AR-9	Ca6	0.452	0.204	0.188	12.325	0.000
Ca-SCP4-AR-final	Ca3	0.443	0.197	0.184	15.740	0.000

The ten stage regression equations are slightly linearly correlated to SCP4 as all their R values of these models are below 0.5. The R values for first five stage equations are the same. This indicates that Ca1, Ca4 and Ca8 are not essential to SCP4.

10.9.2 Analysis for subcontractors for SCP4 (Ca-SCP4-SC)

a. The correlation coefficients of Ca-SCP4-SC model

Table 10.60 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP4-SC model in a descending order of priority and the comparison with Ca-SCP4-AR model.

Table 10.60: Correlation coefficient of Ca-SCP4-SC model

Variables	A	B	C
Ca4	0.367	0.314	0.053
Ca7	0.352	0.358	-0.006
Ca5	0.313	0.283	0.030
Ca2	0.308	0.309	-0.001
Ca10	0.296	0.265	0.031
Ca11	0.286	0.345	-0.059
Ca3	0.276	0.339	-0.063
Ca6	0.275	0.213	0.062
Ca8	0.250	0.330	-0.080
Ca12	0.224	0.190	0.034
Ca1	0.214	0.291	-0.077
Ca9	0.196	0.350	-0.154

A: Pearson correlation coefficient (r) of Ca-SCP4-SC model.

B: Pearson correlation coefficient (r) of Ca-SCP4-AR model.

C: Difference of absolute value of A and absolute value of B.

According to the subcontractors' data, all the causes were only very fairly linearly correlated with SCP4 as their r coefficients range from 0.367 to 0.196. Except Ca9, the r coefficients of the causes of Ca-SCP3-AR model and Ca-SCP3-SC model are consistent. The biggest difference in r coefficient of these two models is only 0.077.

b. Selecting variables for Ca-SCP4-SC model

Eleven stage regression equations were generated in the analysis. The Ca-SP4-SC-final regression equation consists of Ca4 and Ca7. Ca7 is one of the three independent variables of Ca-SP4-AR-final regression equation. Table 10.61 summarizes the details of the standard and simple form regression equations of Ca-SCP4-SC model.

Table 10.61: Regression equations of Ca-SCP4-SC model

Model	Regression equations
Ca-SCP4-SC-1	SCP4 = 3.159 - 0.078xCa1 + 0.166xCa2 - 0.075xCa3 + 0.128xCa4 + 0.010xCa5 + 0.037xCa6 + 0.184xCa7 + 0.011xCa8 - 0.069xCa9 + 0.157xCa10 - 0.001xCa11 + 0.068xCa12
Ca-SCP4-SC-final	SCP4 = 3.650 + 0.228xCa4 + 0.197xCa7

c. Explaining the variability of Ca-SCP4-SC model

Table 10.62 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations of Ca-SCP4-SC model. All the stage regression equations are only fairly linearly correlated to SCP4 as their R values are slightly below 0.5. The R values for first two stage regression equations are the same Ca11 is not thus essential to SCP4 according to the views from subcontractors.

Table 10.62: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP4-SC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP4-SC-1		0.474	0.224	0.135	2.505	0.006
Ca-SCP4-SC-2	Ca11	0.474	0.224	0.143	2.759	0.004
Ca-SCP4-SC-3	Ca5	0.473	0.224	0.151	3.063	0.002
Ca-SCP4-SC-4	Ca8	0.473	0.224	0.159	3.433	0.001
Ca-SCP4-SC-5	Ca6	0.472	0.223	0.165	3.867	0.000
Ca-SCP4-SC-6	Ca9	0.469	0.220	0.170	4.393	0.000
Ca-SCP4-SC-7	Ca1	0.465	0.216	0.174	5.063	0.000
Ca-SCP4-SC-8	Ca12	0.460	0.212	0.176	5.960	0.000
Ca-SCP4-SC-9	Ca3	0.455	0.207	0.178	7.300	0.000
Ca-SCP4-SC-10	Ca2	0.445	0.198	0.177	9.318	0.000
Ca-SCP4-SC-final	Ca10	0.427	0.182	0.168	12.685	0.000

10.9.3 Analysis for main contractor for SCP4 (Ca-SCP4-MC)

a. The correlation coefficients of Ca-SCP4-MC model

Table 10.63 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP4-MC model in a descending order of priority and the comparison with the coefficients of the Ca-SCP4-AR model. The r coefficients range from 0.503 to 0.006. Only Ca5 has the r coefficient slightly above 0.5. Ca6 and Ca12 have a very low r coefficient. Compared with the Ca-SCP4-AR model, there is a bigger difference between highest and lowest r coefficients.

Table 10.63: Correlation coefficient of Ca-SCP4-MC model

Variables	A	B	C
Ca3	0.503	0.339	0.164
Ca5	0.457	0.283	0.174
Ca7	0.377	0.358	0.019
Ca2	0.374	0.309	0.065
Ca4	0.352	0.314	0.038
Ca9	0.348	0.350	-0.002
Ca8	0.324	0.330	-0.006
Ca1	0.309	0.291	0.018
Ca11	0.285	0.345	-0.060
Ca10	0.248	0.265	-0.017
Ca6	0.067	0.213	-0.146
Ca12	0.006	0.190	-0.184

A: Pearson correlation coefficient (r) of Ca-SCP4-MC model.

B: Pearson correlation coefficient (r) of Ca-SCP4-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP4-MC model

Twelve stage regression equations were generated for Ca-SCP4-MC model. Ca-SCP4-SC-final regression equation only has one independent variable, Ca3 which is included in Ca-SCP4-AR-final regression equation. Table 10.64 summarizes the details of the standard and simple form regression equations of the Ca-SCP4-MC model.

Table 10.64: Regression equations of Ca-SCP4-MC model

Model	Regression equations
Ca-SCP4-MC-1	SCP4 = 3.050 - 0.031xCa1 + 0.046xCa2 + 0.254xCa3 - 0.295xCa4 + 0.312xCa5 - 0.011xCa6 + 0.166xCa7 - 0.139xCa8 + 0.198xCa9 + 0.094xCa10 + 0.018xCa11 - 0.124xCa12
Ca-SCP4-MC-final	SCP4= 3.495 + 0.363xCa3

c. Explaining the variability of Ca-SCP4-MC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the twelve stage regression equations are summarized in Table 10.65. The stage regression equations are fairly good linearly correlated to SCP4. Their R values ranges from 0.623 to 0.503. The R values for first four stage regression equations are the same. Ca1, Ca2 and Ca11 are thus non-essential causes to SCP4 according to the views from main contractors.

Table 10.65: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP4-MC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP4-MC-1		0.623	0.389	0.214	2.226	0.028
Ca-SCP4-MC-2	Ca11	0.623	0.389	0.232	2.484	0.016
Ca-SCP4-MC-3	Ca1	0.623	0.388	0.249	2.791	0.009
Ca-SCP4-MC-4	Ca2	0.623	0.388	0.265	3.168	0.005
Ca-SCP4-MC-5	Ca6	0.619	0.383	0.276	3.572	0.001
Ca-SCP4-MC-6	Ca10	0.613	0.376	0.283	4.048	0.001
Ca-SCP4-MC-7	Ca8	0.609	0.370	0.292	4.707	0.001
Ca-SCP4-MC-8	Ca7	0.594	0.352	0.286	5.334	0.000
Ca-SCP4-MC-9	Ca12	0.571	0.326	0.272	6.038	0.000
Ca-SCP4-MC-10	Ca4	0.553	0.306	0.265	7.494	0.000
Ca-SCP4-MC-11	Ca5	0.536	0.287	0.259	10.457	0.000
Ca-SCP4-MC-final	Ca9	0.503	0.253	0.239	17.950	0.000

10.9.4 Analysis for main contractor (Ca-SCP4-CC)

a. The correlation coefficients of Ca-SCP4-CC model

Table 10.66 summarizes the Pearson correlation coefficient (r) of the twelve causes of the Ca-SCP4-CC model in a descending order of priority and the comparison with Ca-SCP4-AR model. The r coefficients range from 0.584 to 0.130. Five out of the twelve causes have r coefficient slightly higher than 0.5. Compared with Ca-SCP4-AR model, all causes except Ca5 and Ca7 have higher r coefficients.

Table 10.66: Correlation coefficient of Ca-SCP4-CC model

Variables	A	B	C
Ca11	0.584	0.345	0.239
Ca9	0.582	0.350	0.232
Ca8	0.576	0.330	0.246
Ca10	0.566	0.265	0.301
Ca1	0.507	0.291	0.216
Ca2	0.470	0.309	0.161
Ca4	0.452	0.314	0.138
Ca12	0.420	0.190	0.230
Ca3	0.382	0.339	0.043
Ca6	0.343	0.213	0.130
Ca7	0.314	0.358	-0.044
Ca5	0.130	0.283	-0.153

A: Pearson correlation coefficient (r) of Ca-SCP4-CC model.

B: Pearson correlation coefficient (r) of Ca-SCP4-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP4-CC model

Nine stage regression equations were generated in the analysis. Ca-SP4-SC-final regression equation consists of Ca4, Ca5, Ca6 and Ca9. Ca5 is an independent variable of the Ca-SP4-AR-final regression equation. Table 10.67 summarizes the details of the standard and simple form regression equations. As the partial coefficient of Ca5 of the Ca-SCP4-CC–final is of negative value, Ca5 should not be considered in the analysis of the essential causes to SCP4.

Table 10.67: Regression equations of Ca-SCP4-CC model

Model	Regression equations
Ca-SCP4-CC -1	SCP4 = 2.271 + 0.515xCa1 - 0.483xCa2 – 0.047xCa3 + 0.571xCa4 - 0.556xCa5 + 0.276xCa6 - 0.312xCa7 + 0.186xCa8 + 0.319xCa9 + 0.006xCa10 - 0.124xCa11 + 0.019xCa12
Ca-SCP4-CC-final	SCP4 = 2.084 + 0.389xCa4 - 0.326xCa5 + 0.224xCa6 + 0.232xCa9

c. Explaining the variability of Ca-SCP4-CC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the nine stage regression equations are summarized in Table 10.68. All the regression equations are strongly linearly correlated to SCP4. Their R values range from 0.794 to 0.717. The R values for first two stage regression equations are the same. Ca10 is a non-essential cause to SCP4 from the views of consultants/clients.

Table 10.68: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP4-CC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP4-CC-1		0.794	0.630	0.259	1.7	0.185
Ca-SCP4-CC-2	Ca10	0.794	0.630	0.316	2.009	0.116
Ca-SCP4-CC-3	Ca12	0.793	0.630	0.365	2.379	0.067
Ca-SCP4-CC-4	Ca3	0.793	0.628	0.405	2.815	0.037
Ca-SCP4-CC-5	Ca11	0.788	0.621	0.431	3.276	0.021
Ca-SCP4-CC-6	Ca8	0.783	0.613	0.453	3.843	0.011
Ca-SCP4-CC-7	Ca2	0.768	0.590	0.453	4.310	0.007
Ca-SCP4-CC-8	Ca1	0.758	0.574	0.462	5.116	0.004
Ca-SCP4-CC-final	Ca7	0.717	0.513	0.416	5.277	0.005

10.9.5 Neural network analysis for Ca-SCP4 models

Table 10.69 summarises the results computed by NeuroShell2 software for the analysis of the causes to SCP4 in the descending order of priority of their correlation coefficients. The correlation coefficients of the neural network outputs range from 0.757 to 0.426.

Table 10.69: Neural network analysis for Ca-SCP4 models

Neural network output	A	B	C	D
Ca-SCP4-AR -final	0.757	15	197	0.0060871
Ca-SCP4-CC-final	0.676	7	25	0.0093866
Ca-SCP4-CC-1	0.664	11	25	0.0122289
Ca-SCP4-MC-1	0.628	14	55	0.0083801
Ca-SCP4-SC-1	0.624	17	117	0.0033353
Ca-SCP4-AR-1	0.567	20	197	0.0052740
Ca-SCP4-MC-final	0.515	9	55	0.0120620
Ca-SCP4-SC-final	0.426	12	117	0.0039349

A: Correlation coefficient of the neural network output

B: Number of hidden neurons

C: Number of patterns processed

D: Minimum error when the training was stopped

10.9.6 Summary for the analysis of the causes to SCP4

Table 10.70 compares the correlation coefficients computed by the multiple regression method and the neural network method for the different models of SCP4. The correlation coefficient of Ca-SCP4-AR-final model computed by neural network method is much higher than that by the multiple regression method. This indicates that linear relationship may not be the best approach to explain the relationship of Ca5, Ca7 and Ca9 to SCP4. There are moderate differences in correlation coefficients of Ca-SCP4-SC-1 model and

Ca-SCP4-CC-1 model computed by the two methods and they are around 0.15. The other correlation coefficients computed by these two methods are quite consistent and the maximum differences is only 0.099. The regression equations for the consultants/clients and main contractors are quite reliable to explain the relationship of the contribution of the causes SCP4. Ca4, Ca7 and Ca9 are of equal importance to SCP4 as they are included in two out of the four simple form regression equations.

Table 10.70: Comparison of multiple regression method and neural network method for SCP4

Model	A	B	C	D
Ca-SCP4-AR-1	All	0.468	0.567	-0.099
Ca-SCP4-AR-final	Ca5, Ca7, Ca9	0.443	0.757	-0.314
Ca-SCP4-SC-1	All	0.474	0.624	-0.150
Ca-SCP4-SC-final	Ca4, Ca7	0.427	0.426	0.001
Ca-SCP4-MC-1	All	0.623	0.628	-0.005
Ca-SCP4-MC-final	Ca3	0.503	0.515	-0.012
Ca-SCP4-CC-1	All	0.794	0.664	0.130
Ca-SCP4-CC-final	Ca4, Ca6, Ca9	0.717	0.676	0.041

A: Independent variables with positive partial coefficient included in the model.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network method.

D: Difference of B and C.

10.10 Analysis for SCP5

10.10.1 Analysis for all type of respondents for SCP5 (Ca-SCP5-AR)

c. Outliers

No extreme case was detected from the raw data by the Mahalanobis statistical method. As a result, 179 sets of data were included for the analysis of causes to SCP5.

b. Examining the variables of Ca-SCP5-AR model

The scatterplot matrix shown in Appendix T indicates that the causes are approximately linearly correlated to SCP5 based on visual examination of the data. There is no need to transform the data for the multiple regression analysis.

c. Testing hypothesis for Ca-SCP5-AR model

The F-statistics for the regression with all the twelve causes of site coordination problem, SCP5 is 4.819 and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is rejected. It can thus be concluded that there is at least one of the coefficients is not 0.

d. The correlation coefficients of Ca-SCP5-AR model

Table 10.71 summarizes the Pearson correlation coefficient (r) of the twelve causes to the site coordination problems of Ca-SCP5-AR model in a descending order of priority. All causes have positive coefficient, but they are very fairly linearly correlated to SCP5 as the r coefficients decrease from 0.379 to 0.132. Ca10 has the highest r coefficient.

Table 10.71: Correlation coefficient of Ca-SCP5-AR model

Variables	Pearson correlation coefficient (r)
Ca10	0.379
Ca3	0.338
Ca7	0.335
Ca11	0.332
Ca4	0.323
Ca5	0.322
Ca2	0.241
Ca1	0.238
Ca9	0.278
Ca8	0.271
Ca6	0.260
Ca12	0.132

e. Selecting variables for Ca-SCP5-AR model

Ten stage regression equations were generated in the analysis. The Ca-SCP5-AR-final regression equation comprised Ca3, Ca7 and Ca10. Table 10.72 summarizes the details of the standard form and simple form regression equations of Ca-SCP5-AR model.

Table 10.72: Regression equations of Ca-SCP5-AR model

Model	Regression equations
Ca-SCP5-AR-1	SCP5 = 3.536 + 0.025xCa1 - 0.093xCa2 + 0.112xCa3 - 0.013xCa4 + 0090xCa5 + 0.015xCa6 + 0.140xCa7 - 0.049xCa8 + 0.027xCa9 + 0.216xCa10 + 0.074xCa11 - 0.068xCa12
Ca-SCP5-AR-final	SCP5 = 2.394 + 0.121xCa3+ 0.137xCa7 + 0.235xCa10

f. Explaining the variability of Ca-SCP5-AR model

Table 10.73 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations of Ca-SCP5-AR model.

Table 10.73: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP5-AR model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP5-AR-1		0.489	0.239	0.190	4.819	0.000
Ca-SCP5-AR-2	Ca4	0.489	0.239	0.194	5.283	0.000
Ca-SCP5-AR-3	Ca6	0.489	0.239	0.198	5.837	0.000
Ca-SCP5-AR-4	Ca1	0.488	0.238	0.202	6.503	0.000
Ca-SCP5-AR-5	Ca9	0.487	0.237	0.205	7.311	0.000
Ca-SCP5-AR-6	Ca8	0.486	0.237	0.208	8.366	0.000
Ca-SCP5-AR-7	Ca11	0.482	0.233	0.208	9.596	0.000
Ca-SCP5-AR-8	Ca12	0.479	0.229	0.209	11.354	0.000
Ca-SCP5-AR-9	Ca2	0.474	0.225	0.208	13.901	0.000
Ca-SCP5-AR-final	Ca5	0.469	0.220	0.208	18.152	0.000

The ten stage regression equations are only slightly linearly correlated to SCP5 as all their R values range from 0.489 to 0.469. The R values for first three stage equations are the same. This indicates that Ca4 and Ca6 are not essential to SCP5.

10.10.2 Analysis for subcontractors for SCP5 (Ca-SCP5-SC)

a. The correlation coefficients of Ca-SCP5-SC model

Table 10.74 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP5-SC model in a descending order of priority and compares their coefficients with Ca-SCP5-AR model. According to the subcontractors' data, the r coefficients range from 0.475 to 0.167. The r coefficients of the causes except Ca2 and Ca10 of Ca-SCP5-SC model are higher than that of Ca-SCP5-AR model.

Table 10.74: Correlation coefficient of Ca-SCP5-SC model

Variables	A	B	C
Ca7	0.475	0.335	0.140
Ca5	0.439	0.322	0.117
Ca9	0.404	0.278	0.126
Ca3	0.402	0.338	0.064
Ca6	0.400	0.260	0.140
Ca4	0.371	0.323	0.048
Ca11	0.332	0.332	0.000
Ca10	0.311	0.379	-0.068
Ca8	0.283	0.271	0.012
Ca1	0.264	0.238	0.026
Ca2	0.197	0.241	-0.044
Ca12	0.167	0.132	0.035

A: Pearson correlation coefficient (r) of Ca-SCP5-SC model

B: Pearson correlation coefficient (r) of Ca-SCP5-AR model

C: Difference of absolute value of A and absolute value of B

b. Selecting variables for Ca-SCP5-SC model

Nine stage regression equations were generated in the analysis. Although the Ca-SP5-SC-final regression equation consists of Ca2, Ca5, Ca7 and Ca9, only Ca7 is one of the three independent variables of Ca-SP5-AR-final regression equation. Table 10.75 summarizes the details of the standard form and simple form regression equations of Ca-SCP5-SC model. As Ca2 has negative partial coefficient, Ca2 would be included in the analysis of the essential causes to SCP5.

Table 10.75: Regression equations of Ca-SCP5-SC model

Model	Regression equations
Ca-SCP5-SC-1	SCP5 = 1.743 + 0.046xCa1 - 0.192xCa2 + 0.070xCa3 + 0.053xCa4 + 0.201xCa5 - 0.0001xCa6 + 0.252xCa7 - 0.035xCa8 + 0.195xCa9 + 0.001xCa10 + 0.016xCa11 - 0.054xCa12
Ca-SCP5-SC-final	SCP5 = 1.642 - 0.131xCa2 + 0.238xCa5 + 0.261xCa7 + 0.201xCa9

c. Explaining the variability of Ca-SCP5-SC model

Table 10.76 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the nine stage regression equations. All the stage regression equations are fairly good linear correlation in SCP5 as the R values of these models range from 0.608 to 0.597. The R values for first four stage regression equations are the same. Ca6, Ca10 and Ca11 are thus not essential to SCP5 according to the subcontractors' data.

Table 10.76: R, R Square, Adjusted R Square, F-statistic and Significance Level values

of the stage regression equations of Ca-SCP5-SC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP5-SC-1		0.608	0.370	0.397	5.092	0.000
Ca-SCP5-SC-2	Ca6	0.608	0.370	0.304	5.608	0.000
Ca-SCP5-SC-3	Ca10	0.608	0.370	0.311	6.228	0.000
Ca-SCP5-SC-4	Ca11	0.608	0.370	0.317	6.979	0.000
Ca-SCP5-SC-5	Ca8	0.607	0.369	0.322	7.892	0.000
Ca-SCP5-SC-6	Ca1	0.606	0.368	0.327	9.059	0.000
Ca-SCP5-SC-7	Ca4	0.605	0.366	0.331	10.586	0.000
Ca-SCP5-SC-8	Ca12	0.602	0.362	0.334	12.623	0.000
Ca-SCP5-SC-final	Ca3	0.597	0.356	0.333	15.497	0.000

10.10.3 Analysis for main contractor for SCP5 (Ca-SCP5-MC)

a. The correlation coefficients of Ca-SCP5-MC model

Table 10.77 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP5-MC modal in descending order of priority and the comparison with the Ca-SCP5-AR model. The r coefficients decrease from 0.331 to -0.071. Compared with the Ca-SCP5-AR model, all the courses have lower r coefficients. All causes except Ca12 have positive r coefficients. The r coefficient of Ca12 is only 0.071 and thus it should have no significant influence in the multiple regression analysis.

Table 10.77: Correlation coefficient of Ca-SCP5-MC model

Variables	A	B	C
Ca3	0.331	0.338	-0.007
Ca10	0.319	0.379	-0.060
Ca5	0.284	0.322	-0.038
Ca7	0.278	0.335	-0.057
Ca9	0.258	0.278	-0.020
Ca8	0.243	0.271	-0.028
Ca4	0.234	0.323	-0.089
Ca11	0.220	0.332	-0.112
Ca2	0.179	0.241	-0.062
Ca1	0.125	0.238	-0.113
Ca6	0.061	0.260	-0.199
Ca12	-0.071	0.132	-0.203

A: Pearson correlation coefficient (r) of Ca-SCP5-MC model.

B: Pearson correlation coefficient (r) of Ca-SCP5-AR model.

C: Difference of absolute value of A and absolute value of B.

c. Selecting variables for Ca-SCP5-MC model

Ten stage regression equations were generated in the analysis. Ca-SP5-MC-final regression equation comprises Ca3, Ca10 and Ca12. Ca10 is a common independent variable of Ca-SP5-AR-final regression equation. Table 10.78 summarizes the details of the standard form and simple form regression equations of the Ca-SCP5-MC model. As Ca12 has negative partial coefficient, Ca12 would be included in the analysis on the essential causes to SCP5.

Table 10.78: Regression equations of Ca-SCP5-MC model

Model	Regression equations
Ca-SCP5-MC-1	SCP5 = 3.237 - 0.001xCa1 - 0.114xCa2 + 0.239xCa3 - 0.162xCa4 + 0.161xCa5 - 0.004xCa6 + 0.125xCa7 - 0.081xCa8 + 0.081xCa9 + 0.428xCa10 - 0.055xCa11 - 0.269xCa12
Ca-SCP5-MC-final	SCP5= 3.136 + 0.213xCa3 + 0.388xCa10 - 0.260xCa12

d. Explaining the variability of Ca-SCP5-MC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the ten stage regression equations are summarized in Table 10.79. The stage regression equations are fairly good linearly correlated to SCP5 as their R values range from 0.549 to 0.511. The R values for first three stage regression equations are the same. Ca4 and Ca10 thus are non-essential causes to SCP5 according to the views from main contractors.

Table 10.79: R, R Square and Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP5-MC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP5-MC-1		0.549	0.302	0.102	1.511	0.158
Ca-SCP5-MC-2	Ca1	0.549	0.302	0.123	1.688	0.109
Ca-SCP5-MC-3	Ca6	0.549	0.301	0.142	1.897	0.071
Ca-SCP5-MC-4	Ca11	0.548	0.300	0.160	2.143	0.045
Ca-SCP5-MC-5	Ca9	0.546	0.298	0.176	2.441	0.027
Ca-SCP5-MC-6	Ca8	0.543	0.295	0.190	2.808	0.016
Ca-SCP5-MC-7	Ca4	0.537	0.288	0.199	3.234	0.009
Ca-SCP5-MC-8	Ca5	0.532	0.284	0.210	3.878	0.005
Ca-SCP5-MC-9	Ca7	0.527	0.278	0.220	4.813	0.002
Ca-SCP5-MC-final	Ca2	0.511	0.261	0.218	6.013	0.001

10.10.4 Analysis for consultants/clients (Ca-SCP5-CC)

a. The correlation coefficients of Ca-SCP5-CC model

Table 10.80 summarizes the Pearson correlation coefficient (r) of the twelve causes of the Ca-SCP5-CC model in a descending order of priority and the comparison with Ca-SCP5-AR model. The r coefficients range from 0.675 to 0.050. Six out of the twelve causes have r coefficients higher than 0.5. Compared with Ca-SCP4-AR model, all causes have higher r coefficients except the three most poorly correlated causes, Ca3, Ca5 and Ca7.

Table 10.80: Correlation coefficient of Ca-SCP5-CC model

Variables	A	B	C
Ca11	0.675	0.332	0.343
Ca10	0.617	0.379	0.238
Ca9	0.569	0.278	0.291
Ca1	0.549	0.238	0.311
Ca12	0.536	0.132	0.404
Ca8	0.517	0.271	0.246
Ca2	0.474	0.241	0.233
Ca4	0.356	0.323	0.033
Ca6	0.334	0.260	0.074
Ca7	0.232	0.335	-0.103
Ca3	0.193	0.338	-0.145
Ca5	0.050	0.322	-0.272

A: Pearson correlation coefficient (r) of Ca-SCP5-CC model.

B: Pearson correlation coefficient (r) of Ca-SCP5-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP5-CC model

Nine stage regression equations were generated in the analysis. Ca-SP5-CC-final regression equation consists of Ca1, Ca3, Ca5, Ca7 and Ca11. Ca3 and Ca7 are common independent variables of the Ca-SP5-AR-final regression equation. Table 10.81

summarizes the details of the standard form and simple form regression equations. As the partial coefficient of Ca3, Ca5 and Ca7 are of negative values, these causes would not be considered in the analysis on the essential causes to SCP5.

Table 10.81: Regression equations of Ca-SCP5-CC model

Model	Regression equations
Ca-SCP5-CC-1	SCP5 = 3.773 + 0.863xCa1 - 0.318xCa2 – 0.198xCa3 + 0.067xCa4 - 0.527xCa5 + 0.165xCa6 - 0.392xCa7 + 0.137xCa8 + 0.173xCa9 + 0.052xCa10 + 0.321xCa11 - 0.076xCa12
Ca-SCP5-CC-final	SCP5 = 3.973 + 0.620xCa1 - 0.253xCa3 - 0.363xCa5- 0.229xCa7 + 0.487xCa11

c. Explaining the variability of Ca-SCP5-CC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eight stage regression equations have been summarized in Table 10.82. All the regression equations are very strongly linearly correlated to SCP5. Their R values range from 0.919 to 0.893. The R of the first two stage regression equations are the same. Ca4 is a non-essential cause to SCP5 from the views of consultants/clients.

Table 10.82: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP5-CC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP5-CC-1		0.919	0.844	0.689	5.425	0.003
Ca-SCP5-CC-2	Ca4	0.919	0.844	0.712	6.382	0.001
Ca-SCP5-CC-3	Ca10	0.918	0.843	0.731	7.514	0.000
Ca-SCP5-CC-4	Ca12	0.916	0.838	0.741	8.632	0.000
Ca-SCP5-CC-5	Ca8	0.914	0.835	0.752	10.105	0.000
Ca-SCP5-CC-6	Ca2	0.908	0.824	0.752	11.384	0.000
Ca-SCP5-CC-7	Ca6	0.893	0.798	0.730	11.839	0.000
Ca-SCP5-CC-final	Ca9	0.877	0.769	0.708	12.655	0.000

10.10.5 Neural network analysis for Ca-SCP5 models

Table 10.83 summarises the neural network results computed by NeuroShell2 software for the analysis of the causes to the SCP5 in the descending order of priority of their correlation coefficients. The correlation coefficients of the neural network outputs range from 0.876 to 0.468. The neural network outputs of the consultants/clients' data and from the overall data have the highest and lowest correlation coefficients respectively.

Table 10.83: Neural network analysis for Ca-SCP5 models

Neural network output	A	B	C	D
Ca-SCP5-CC-final	0.876	8	25	0.0004074
Ca-SCP5-CC-1	0.779	11	25	0.0137959
Ca-SCP5-MC-final	0.652	9	55	0.0018430
Ca-SCP5-SC-final	0.586	13	117	0.0069866
Ca-SCP5-SC-1	0.568	17	117	0.0070013
Ca-SCP5-MC-1	0.547	14	55	0.0053994
Ca-SCP5-AR-1	0.440	20	197	0.0036203
Ca-SCP5-AR-final	0.468	15	197	0.0039374

A: Correlation coefficient

B: Number of hidden neurons

C: Number of patterns processed

D: Minimum error when the training was stopped

10.10.6 Summary for the analysis of the causes to SCP5

Table 10.84 compares the correlation coefficients computed by the multiple regression method and the neural network method for the different models of SCP5. There are moderate differences in correlation coefficients computed by the two methods for Ca-SCP5-MC-final and Ca-SCP5-CC-1 model and the differences are around 0.14. The other correlation coefficients computed by these two methods are quite consistent and the maximum differences is only 0.049. All regression equations except that for the overall data are quite reliable to explain the relationship of the contribution of the causes to SCP5. Ca3, Ca7 and Ca10 are the most essential cause to SCP5 as they are included in two out of the four simple form regression equations.

Table 10.84: Comparison of multiple regression method and neural network method for SCP5

Model	A	B	C	D
Ca-SCP5-AR -1	All	0.489	0.440	0.049
Ca-SCP5-AR -final	Ca3, Ca7, Ca10	0.469	0.468	0.001
Ca-SCP5-SC -1	All	0.608	0.568	0.040
Ca-SCP5-SC -final	Ca5, Ca7, Ca9	0.597	0.586	0.011
Ca-SCP5-MC -1	All	0.549	0.547	0.002
Ca-SCP5-MC -final	Ca3, Ca10	0.511	0.652	-0.141
Ca-SCP5-CC -1	All	0.919	0.779	0.140
Ca-SCP5-CC -final	Ca1, Ca11	0.877	0.876	0.001

A: Independent variables included in the model.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network method.

D: Difference of B and C.

10.11 Analysis for SCP6

10.11.1 Analysis for all type of respondents for SCP6 (Ca-SCP6-AR)

a. Outliers

No extreme cases were detected by the Mahalanobis statistical method. As a result, 197 sets of data were included for the multiple regression analysis of causes to SCP6.

b. Examining the variables of Ca-SCP6-AR model

The scatterplot matrix shown in Appendix T indicates that the causes are approximately linearly correlated to SCP6 based on visual examination of the data. There is no need to transform the data for the multiple regression analysis.

c. Testing hypothesis for Ca-SCP6-AR model

The F-statistics for the regression with all the twelve causes of site coordination problems to SCP6 is 4.149 and the observed significance level is 0.000. The hypothesis that $b_k = 0$ is thus rejected. It can be concluded that there is at least one of the coefficients is not.

c. The correlation coefficients of Ca-SCP6-AR model

Table 10.85 summarizes the Pearson correlation coefficient (r) of the twelve causes to the site coordination problems, SCP6 in a descending order of priority. All causes have positive coefficient, but they are just fairly linearly correlated to SCP6 as the r coefficients range from 0.384 to 0.209.

Table 10.85: Correlation coefficient of Ca-SCP6-AR model

Variables	Pearson correlation coefficient (r)
Ca7	0.384
Ca3	0.348
Ca1	0.299
Ca2	0.299
Ca11	0.293
Ca9	0.276
Ca8	0.272
Ca6	0.266
Ca5	0.252
Ca4	0.244
Ca10	0.231
Ca12	0.209

d. Selecting variables for Ca-SCP6-AR model

Eleven stage regression equations were generated in the analysis. The Ca-SCP6-AR-final regression equation comprised Ca3 and Ca7. Table 10.86 summarizes the details of the standard and simple form regression equations of Ca-SCP6-AR model.

Table10.86: Regression equations of Ca-SCP6-AR model

Model	Regression equations
Ca-SCP6-AR-1	SCP6 = 2.911 + 0.042xCa1 + 0.060Ca2 + 0.122xCa3 - 0.126xCa4 + 0074xCa5 - 0.015xCa6 + 0.196xCa7 - 0.067xCa8 + 0.031xCa9 + 0.050xCa10 + 0.046xCa11 + 0.054xCa12
Ca-SCP6-AR-final	SCP6 = 3.454 + 0.161xCa3+ 0.208xCa7

e. Explaining the variability of Ca-SCP6-AR model

Table 10.87 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations of Ca-SCP6-AR model.

Table 10.87: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP6-AR model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP6-AR-1		0.461	0.213	0.162	4.149	0.000
Ca-SCP6-AR-2	Ca6	0.461	0.213	0.162	4.546	0.000
Ca-SCP6-AR-3	Ca9	0.460	0.212	0.170	5.002	0.000
Ca-SCP6-AR-4	Ca1	0.459	0.210	0.172	5.537	0.000
Ca-SCP6-AR-5	Ca10	0.457	0.208	0.175	6.190	0.000
Ca-SCP6-AR-6	Ca8	0.455	0.207	0.177	7.039	0.000
Ca-SCP6-AR-7	Ca11	0.451	0.203	0.178	8.087	0.000
Ca-SCP6-AR-8	Ca5	0.447	0.200	0.179	9.537	0.000
Ca-SCP6-AR-9	Ca4	0.444	0.197	0.180	11.757	0.000
Ca-SCP6-AR-10	Ca2	0.439	0.193	0.181	15.397	0.000
Ca-SCP6-AR-final	Ca12	0.428	0.183	0.175	21.791	0.000

The eleven stage regression equations are only slightly linearly correlated to SCP6 as all their R values range from 0.461 to 0.428. The R values for first two stage equations are the same. This indicates that Ca6 is not essential to SCP6.

10.11.2 Analysis for subcontractors for SCP6 (Ca-SCP6-SC)

a. The correlation coefficients of Ca-SCP6-SC model

Table 10.88 summarizes the Pearson correlation coefficients (r) of the twelve causes of Ca-SCP6-SC model in a descending order of priority and compares their coefficients with Ca-SCP6-AR model.

Table 10.88: Correlation coefficient of Ca-SCP6-SC model

Variables	A	B	C
Ca7	0.487	0.384	0.103
Ca2	0.320	0.299	0.021
Ca9	0.306	0.276	0.030
Ca3	0.304	0.348	-0.044
Ca4	0.281	0.244	0.037
Ca11	0.280	0.293	-0.013
Ca5	0.264	0.252	0.012
Ca6	0.241	0.266	-0.025
Ca1	0.238	0.299	-0.061
Ca10	0.223	0.231	-0.008
Ca8	0.212	0.272	-0.060
Ca12	0.099	0.209	-0.110

A: Pearson correlation coefficient (r) of Ca-SCP6-SC model.

B: Pearson correlation coefficient (r) of Ca-SCP6-AR model.

C: Difference of absolute value of A and absolute value of B.

The r coefficients range from 0.487 to 0.009 and they are more diverged compared with Ca-SCP6-AR model. The difference between the highest and lowest coefficient is 0.213 higher than that of Ca-SCP6-AR model.

b. Selecting variables for Ca-SCP6-SC model

Eleven stage regression equations were generated in the analysis. The Ca-SP6-SC-final regression equation comprised Ca2 and Ca7. Ca7 is one of the two independent variables of Ca-SP6-AR-final regression equation. Table 10.89 summarizes the details of the standard form and simple form regression equations of Ca-SCP6-SC model.

Table 10.89: Regression equations of Ca-SCP6-SC model

Model	Regression equations
Ca-SCP6-SC-1	SCP6 = 2.693 - 0.012xCa1 + 0.144xCa2 - 0.060xCa3 - 0.077xCa4 + 0.039xCa5 - 0.080xCa6 + 0.385xCa7 - 0.077xCa8 + 0.141xCa9 + 0.077xCa10 + 0.061xCa11 - 0.057xCa12
Ca-SCP6-SC-final	SCP6 = 2.962 + 0.130xCa2 + 0.344xCa7

c. Explaining the variability of Ca-SCP6-SC model

Table 10.90 summarizes the R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations. The stage regression equations are slightly good linearly correlated to SCP6 as their R values of these models range from 0.545 to 0.512. The R values for the first four stage regression equations are the same.

Ca1, Ca4 and Ca11 are thus not essential to SCP6 according to the views from subcontractors.

Table 10.90: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP6-SC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP6-SC-1		0.545	0.297	0.216	3.665	0.000
Ca-SCP6-SC-2	Ca11	0.545	0.297	0.224	4.037	0.000
Ca-SCP6-SC-3	Ca4	0.545	0.297	0.231	4.482	0.000
Ca-SCP6-SC-4	Ca1	0.545	0.297	0.238	5.025	0.000
Ca-SCP6-SC-5	Ca5	0.544	0.296	0.244	5.684	0.000
Ca-SCP6-SC-6	Ca3	0.542	0.294	0.249	6.483	0.000
Ca-SCP6-SC-7	Ca8	0.539	0.290	0.251	7.488	0.000
Ca-SCP6-SC-8	Ca10	0.534	0.285	0.253	8.865	0.000
Ca-SCP6-SC-8	Ca12	0.530	0.281	0.256	10.955	0.000
Ca-SCP6-SC-8	Ca6	0.524	0.274	0.255	14.233	0.000
Ca-SCP6-SC-final	Ca9	0.512	0.262	0.249	20.227	0.000

10.11.3 Analysis for main contractor for SCP6 (Ca-SCP6-MC)

The correlation coefficients of Ca-SCP6-MC model

Table 10.91 summarizes the Pearson correlation coefficients (r) of the twelve causes of the Ca-SCP6-MC model in a descending order of priority and compares their coefficients with Ca-SCP6-AR model. The r coefficients range from 0.419 to 0.016. The r coefficients of the Ca-SCP6-MC are more diverged compared with Ca-SCP6-AR model.

The difference between the highest and lowest coefficient is 0.321 higher than that of Ca-SCP6-AR model.

Table 10.91: Correlation coefficient of Ca-SCP6-MC model

Variables	A	B	C
Ca3	0.419	0.348	0.071
Ca5	0.319	0.252	0.067
Ca1	0.282	0.299	-0.017
Ca7	0.244	0.384	-0.140
Ca2	0.217	0.299	-0.082
Ca8	0.223	0.272	-0.049
Ca10	0.207	0.231	-0.024
Ca4	0.199	0.244	-0.045
Ca9	0.180	0.276	-0.096
Ca11	0.174	0.293	-0.119
Ca12	0.135	0.209	-0.074
Ca6	0.016	0.266	-0.250

A: Pearson correlation coefficient (r) of Ca-SCP6-MC model

B: Pearson correlation coefficient (r) of Ca-SCP6-AR model

C: Difference of absolute value of A and absolute value of B

b. Selecting variables for Ca-SCP6-MC model

Twelve stage regression equations were generated for Ca-SCP6-MC model. Ca-SP6-MC-final regression equation comprised one independent variable only, Ca3 which is also an independent variable of Ca-SP6-AR-final regression equation. Table 10.92 summarizes the details of the standard form and simple form regression equations of the Ca-SCP6-MC model.

Table 10.92: Regression equations of Ca-SCP6-MC model

Model	Regression equations
Ca-SCP6-MC-1	SCP6 = 2.975 + 0.185xCa1 - 0.212xCa2 + 0.271xCa3 - 0.197xCa4 + 0.197xCa5 - 0.022xCa6 + 0.145xCa7 - 0.060xCa8 + 0.009xCa9 + 0.133xCa10 - 0.0005xCa11 - 0.017xCa12
Ca-SCP6-MC-final	SCP6= 3.583 + 0.308xCa3

c. Explaining the variability of Ca-SCP6-MC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the twelve stage regression equations have been summarized in Table 10.93. The stage regression equations are fairly linearly correlated to SCP6. Their R values ranges from 0.509 to 0.419. The R values for first four stage regression equations are the same. Ca9, Ca11 and Ca12 are thus not essential to SCP6 according to the views from main contractors.

Table 10.93: R, R Square, Adjusted R Square F-statistic and Significance Level values of the stage regression equations of Ca-SCP6-MC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP6-MC-1		0.509	0.259	0.047	1.223	0.300
Ca-SCP6-MC-2	Ca11	0.509	0.259	0.069	1.366	0.224
Ca-SCP6-MC-3	Ca9	0.509	0.259	0.091	1.537	0.159
Ca-SCP6-MC-4	Ca12	0.509	0.259	0.110	1.744	0.107
Ca-SCP6-MC-5	Ca8	0.507	0.257	0.127	1.985	0.070
Ca-SCP6-MC-6	Ca10	0.496	0.246	0.134	5.192	0.052
Ca-SCP6-MC-7	Ca4	0.482	0.232	0.136	2.416	0.040
Ca-SCP6-MC-8	Ca5	0.467	0.218	0.138	2.732	0.030
Ca-SCP6-MC-9	Ca6	0.451	0.204	0.140	3.200	0.020
Ca-SCP6-MC-10	Ca1	0.436	0.190	0.143	3.993	0.012
Ca-SCP6-MC-11	Ca2	0.425	0.181	0.149	5.744	0.006
Ca-SCP6-MC-final	Ca7	0.419	0.176	0.160	11.293	0.001

10.11.4 Analysis for consultants/clients for SCP6 (Ca-SCP6-CC)

a. The correlation coefficients of Ca-SCP6-CC model

Table 10.94 summarizes the Pearson correlation coefficient (r) of the twelve causes of the Ca-SCP6-CC model in a descending order of priority and the comparison with the Ca-SCP6-AR model. The r coefficients range from 0.637 to 0.131. Compared with Ca-SCP6-AR model, all causes have higher r coefficients except three poorly related causes, Ca3, Ca5 and Ca7.

Table 10.94: Correlation coefficient of Ca-SCP6-CC model

Variables	A	B	C
Ca12	0.637	0.209	0.428
Ca11	0.535	0.293	0.242
Ca8	0.533	0.272	0.261
Ca6	0.510	0.266	0.244
Ca2	0.459	0.299	0.160
Ca1	0.454	0.299	0.155
Ca10	0.448	0.231	0.217
Ca9	0.364	0.276	0.088
Ca7	0.358	0.384	-0.026
Ca3	0.340	0.348	-0.008
Ca4	0.331	0.244	0.087
Ca5	0.131	0.252	-0.121

A: Pearson correlation coefficient (r) of Ca-SCP6-CCodel.

B: Pearson correlation coefficient (r) of Ca-SCP6-AR model.

C: Difference of absolute value of A and absolute value of B.

b. Selecting variables for Ca-SCP6-CC model

Eleven stage regression equations were generated in the analysis. Ca-SCP6-CC-final regression equation comprises Ca6 and Ca12. None of them are the independent variables of the Ca-SP6-AR-final regression equation. Table 10.95 summarizes the details of the standard and simple form regression equations.

Table 10.95: Regression equations of Ca-SCP6-CC model

Model	Regression equations
Ca-SCP6-CC-1	SCP6 = 1.687 + 0.187xCa1 - 0.012xCa2 + 0.040xCa3 + 0.043xCa4 - 0.163xCa5 + 0.192xCa6 - 0.086xCa7 + 0.139xCa8 - 0.003xCa9 + 0.035xCa10 - 0.031xCa11 + 0.277xCa12
Ca-SCP6-CC-final	SCP6 = 2.103 + 0.223xCa6 + 0.364xCa12

c. Explaining the variability of Ca-SCP6-CC model

The R, R Square, Adjusted R Square, F-statistic and Significance Level values of the eleven stage regression equations have been summarized in Table 10.96.

Table 10.96: R, R Square, Adjusted R Square, F-statistic and Significance Level values of the stage regression equations of Ca-SCP6-CC model

Model	Variable removed	R	R Square	Adjusted R Square	F-statistic	Significance
Ca-SCP6-CC-1		0.734	0.539	0.079	1.171	0.394
Ca-SCP6-CC-2	Ca9	0.734	0.539	0.150	1.384	0.285
Ca-SCP6-CC-3	Ca2	0.734	0.539	0.210	1.639	0.193
Ca-SCP6-CC-4	Ca4	0.734	0.539	0.263	1.949	0.122
Ca-SCP6-CC-5	Ca11	0.734	0.539	0.308	2.338	0.071
Ca-SCP6-CC-6	Ca10	0.734	0.539	0.349	2.835	0.037
Ca-SCP6-CC-7	Ca3	0.733	0.537	0.383	3.478	0.018
Ca-SCP6-CC-8	Ca7	0.730	0.533	0.410	4.335	0.008
Ca-SCP6-CC-9	Ca5	0.725	0.526	0.431	5.547	0.004
Ca-SCP6-CC-10	Ca8	0.717	0.514	0.445	7.411	0.001
Ca-SCP6-CC-final	Ca1	0.696	0.485	0.438	10.340	0.001

All the regression equations are strongly linearly correlated to SCP6. Their R values ranges from 0.734 to 0.696. The R and R Square values for first six stage regression equations are the same. Ca2, Ca4, Ca9, Ca10 and Ca11 are thus non-essential causes to SCP6 from the views of consultants/clients.

10.11.5 Neural network analysis for Ca-SCP6 models

Table 10.97 summarises the results computed by NeuroShell2 software for the analysis of the causes to the SCP6 in a descending order of priority of their correlation coefficients. The correlation coefficients of the neural network outputs range from 0.876 to 0.426. The neural network outputs of the consultants/clients models have the highest correlation coefficient.

Table 10.97: Neural network analysis for Ca-SCP6 models

Neural network output	A	B	C	D
Ca-SCP6-CC -final	0.876	6	25	0.0043619
Ca-SCP6-CC -1	0.717	11	25	0.0068663
Ca-SCP6-SC-1	0.598	17	117	0.0027775
Ca-SCP6-MC-1	0.528	14	55	0.0137411
Ca-SCP6-SC-final	0.515	12	117	0.0024615
Ca-SCP6-AR-1	0.449	20	197	0.0169730
Ca-SCP6-AR-final	0.427	15	197	0.0143446
Ca-SCP6-MC-final	0.426	8	55	0.0147633

A: Correlation coefficient

B: Number of hidden neurons

C: Number of patterns processed

D: Minimum error when the training was stopped

10.11.6 Summary for the analysis of the causes to SCP6

Table 10.98 compares the correlation coefficients computed by multiple regression method and neural network method for the different models of SCP6. Except that of Ca-SCP6-CC-final, all the correlation coefficients computed by the two methods are quite consistent and the maximum difference is only 0.053. The difference in correlation coefficients of Ca-SCP6-CC-final model by the two methods is only 0.180. The regression equations for consultants/clients' data are good to explain the relationship for the contributions of the causes to SCP6. Ca3 and Ca7 are the most essential causes as they are the variables of two simple form regression equations.

Table 10.98: Comparison of multiple regression method and neural network method for SCP6

Model	A	B	C	D
Ca-SCP6-AR -1	All	0.461	0.449	0.012
Ca-SCP6-AR -final	Ca3, Ca7	0.428	0.427	0.001
Ca-SCP6-SC -1	All	0.545	0.598	-0.053
Ca-SCP6-SC -final	Ca2, Ca7	0.512	0.515	-0.003
Ca-SCP6-MC -1	All	0.509	0.528	-0.019
Ca-SCP6-MC -final	Ca3	0.419	0.426	-0.007
Ca-SCP6-CC -1	All	0.734	0.717	0.017
Ca-SCP6-CC -final	Ca6, Ca12	0.696	0.876	-0.180

A: Independent variables included in the model.

B: Correlation coefficient computed by multiple regression method.

C: Correlation coefficient computed by neural network method.

D: Difference of B and C.

10.12 Summary

A questionnaire survey was conducted to collect data to formulate equations to assess the contributions of the twelve essential causes to the six critical site coordination problems to the performance of subcontractors. One hundred and ninety-seven valid replies were collected. A descriptive statistic analysis was conducted to preliminarily examine the data. Multiple regression analysis was adopted to generate the equations to explain the relationship between the causes and the site coordination problems. Backward elimination approach was used to identify the most essential causes to each of the site coordination problems. The data were also processed by neural network software as a cross checking purpose and the outputs of the analyses were used to validate the reliability of the multiple regression equations.

The descriptive statistic analysis shows that five out of the six essential coordination problems are regarded as fairly frequently occurred problems in the local building projects. All the causes of the problems are regarded to have essential contributions to the occurrence of the site coordination problems. The mean score of the most essential cause, Ca9 is 6.297 and it is only 1.025 higher than lowest mean score cause, Ca6. This indicates that there was no dominant cause to the site coordination problems according to the descriptive statistic analysis.

SPSS software was used for the multiple regression analysis. The analysis covered six main models relating the causes to each of the site coordination problem. As the replies comprised the views from subcontractors, main contractors and consultants/clients, three sub-models for each main model were also computed. As a result, the analysis covered six main models and 18 sub-models.

a. Overall views

Table 10.99 summarizes the R value of the of the standard form regression equations of the overall data in the descending order of priority. The R values of the equations range from 0.585 to 0.461. These regression equations can be used to evaluate the contributions of the twelve essential causes to each of the critical site coordination problems. One way to analyze the importance of each of the causes to the problems is to count the number of simple form regression equations containing that cause as the independent variable. Table 10.100 summarizes the number of critical site coordination problems that were affected by a particular cause according to different type of respondents. According to the overall data, Ca7 is the most important causes as it is the independent variable of four out of the six simple form regression equations. Ca3 and Ca4 are the second important causes. Ca2, Ca8 and Ca10 are third importance causes. Ca1, Ca6, Ca9, Ca11 and Ca12 are less essential items as they are not included in any of the simple form regression equation.

Table 10.99: R value of the of the standard form regression equations of overall data

Model	Regression equation	R value
Ca-SCP1-AR-1	SCP1 = 2.115 + 0.086xCa1 + 0.223xCa2 – 0.026xCa3 + 0.073xCa4 + 0.077xCa5 - 0.054xCa6 + 0.126xCa7 - 0.017xCa8 - 0.028xCa9 + 0.051xCa10 + 0.037xCa11 - 0.016xCa12	0.585
Ca-SCP2-AR-1	SCP2 = 1.187 – 0.007xCa1 + 0.046xCa2 + 0.081xCa3 + 0.122xCa4 + 0.133xCa5 + 0.010xCa6 + 0.011xCa7 + 0.050xCa8 - 0.050xCa9 + 0.141xCa10 + 0.055xCa11 - 0.068xCa12	0.570
Ca-SCP3-AR-1	SCP3 = 2.182 – 0.063xCa1 + 0.147xCa2 + 0.115xCa3 + 0.053xCa4 + 0.090xCa5 - 0.055xCa6 + 0.045xCa7 + 0.093xCa8 - 0.019xCa9 + 0.069xCa10 - 0.033xCa11 + 0.068xCa12	0.498
Ca-SCP5-AR-1	SCP5 = 3.536 + 0.025xCa1 - 0.093xCa2 + 0.112xCa3 - 0.013xCa4 + 0090xCa5 + 0.015xCa6 + 0.140xCa7 - 0.049xCa8 + 0.027xCa9 + 0.216xCa10 + 0.074xCa11 - 0.068xCa12	0.489
Ca-SCP4-AR-1	SCP4 = 3.022 + 0.005xCa1 + 0.041xCa2 + 0.078xCa3 - 0.002xCa4 + 0.095xCa5 - 0.093xCa6 + 0.138xCa7 + 0.005xCa8 + 0.110xCa9 + 0.023xCa10 + 0.037xCa11 + 0.031xCa12	0.468
Ca-SCP6-AR-1	SCP6 = 2.911 + 0.042xCa1 + 0.060Ca2 + 0.122xCa3 - 0.126xCa4 + 0074xCa5 - 0.015xCa6 + 0.196xCa7 - 0.067xCa8 + 0.031xCa9 + 0.050xCa10 + 0.046xCa11 + 0.054xCa12	0.461

Table 10.100: Analysis of the importance of the causes to the site coordination problems

Cause	AR	SC	MC	CC
Ca1	-	-	SCP1, SCP2	SCP5
Ca2	SCP1, SCP3	SCP1, SCP3, SCP6	-	SCP1, SCP2, SCP3
Ca3	SCP3, SCP5, SCP6	-	SCP3, SCP4, SCP5, SCP6	-
Ca4	SCP1, SCP2	SCP2, SCP4	SCP1	SCP4
Ca5	SCP2, SCP4	SCP3, SCP5	SCP2	-
Ca6	-	-	-	SCP4, SCP6
Ca7	SCP1, SCP4, SCP5, SCP6	SCP1, SCP4, SCP5, SCP6	-	-
Ca8	SCP3	SCP2	-	SCP1, SCP2, SCP3
Ca9	SCP4	SCP5	SCP3	SCP4
Ca10	SCP2, SCP5	SCP2	SCP5	-
Ca11	-	-	-	SCP5
Ca12	-	-	-	SCP3, SCP6

AR: Overall views; SC: Views from subcontractors

MC: Views from main contractors; CC: Views from consultants/clients

b. Views from subcontractors

Table 10.100 concludes that Ca7 is the most important cause as it is the independent variable of four out of the six simple form regression equations according to the views from subcontractors. Ca2 is the second important causes. Ca1, Ca3, Ca6, Ca11 and Ca12 are not included in any of the simple form regression equations.

c. Views from main contractors

Table 10.100 indicates that Ca3 is the most important cause as it is the independent variable of four out of the six simple form regression equations according to the views from main contractors. Ca1 is the second essential causes. Ca4, Ca5, Ca9 and Ca10 are of equal importance. Ca2, Ca6, Ca7, Ca8, Ca11 and Ca12 are not included in any of the simple form regression equations.

d. Views from consultants/clients

The Table 9.131 shows that Ca2 and Ca8 are the most important causes as they are the independent variables of three out of the six simple form regression equations. Ca6 and Ca12 are of second importance to site coordination problems. Ca3, Ca5, Ca7 and Ca10 are not included in any of the simple form regression equations.

The above analysis shows that the views on the contributions of the twelve causes to the six site coordination problems from the three types of respondents are not consistent. As the number of data of the subcontractors, main contractors, and clients/consultant is approximately in the ratio of 4:2:1, the overall data can have a good balance to reflect the opinions from the industry as a whole. Thus the analysis results of the overall data should be adopted to eliminate the biases from the different parties. The R values of the standard form regression equations of the overall data range from 0.585 to 0.461 and they are acceptable to be adopted to explain the relationship between the causes to the site coordination problems in the following chapters.

CHAPTER ELEVEN

IMPROVING THE SITE COORDINATION

11.1 Introduction

Six critical site coordination problems and twelve essential causes of these problems were identified in Chapter Seven and Chapter Eight. The regression equations to explain the relationships between the frequency of occurrence of the six critical site coordination problems and the performance of subcontractors in terms of time, cost and quality achievement were computed in Chapter Nine. The 'most critical' site coordination problems to subcontractors' performance were identified by adopting the backward elimination method. The regression equations to show the contributions of the twelve essential causes to each of the critical problems were developed in Chapter Ten. The 'most essential' causes to the site coordination problems were identified by adopting the backward elimination method. The aim of this Chapter is to construct linkage to relate the 'most essential' causes to the 'most important' site coordination problems and subsequently to the performance of subcontractors. The linkages were used to guide main contractors to formulate strategy to improve their site coordination.

11.2 Analyzing the causes of site coordination to project performance

11.2.1 Analysis for all types of subcontractors

a. Linkage for time performance analysis of all types of subcontractors

Figure 11.1 shows the relationships between causes, site coordination problems and time performance of all types of subcontractors. The figure demonstrates that: Ca2, Ca3, Ca4, Ca5, Ca7, Ca8 and Ca10 are the 'most essential' causes to the occurrence of problems SCP1, SCP2 and SCP3 which are the 'most critical' problems affecting the time performance of subcontractors on the Hong Kong building projects.

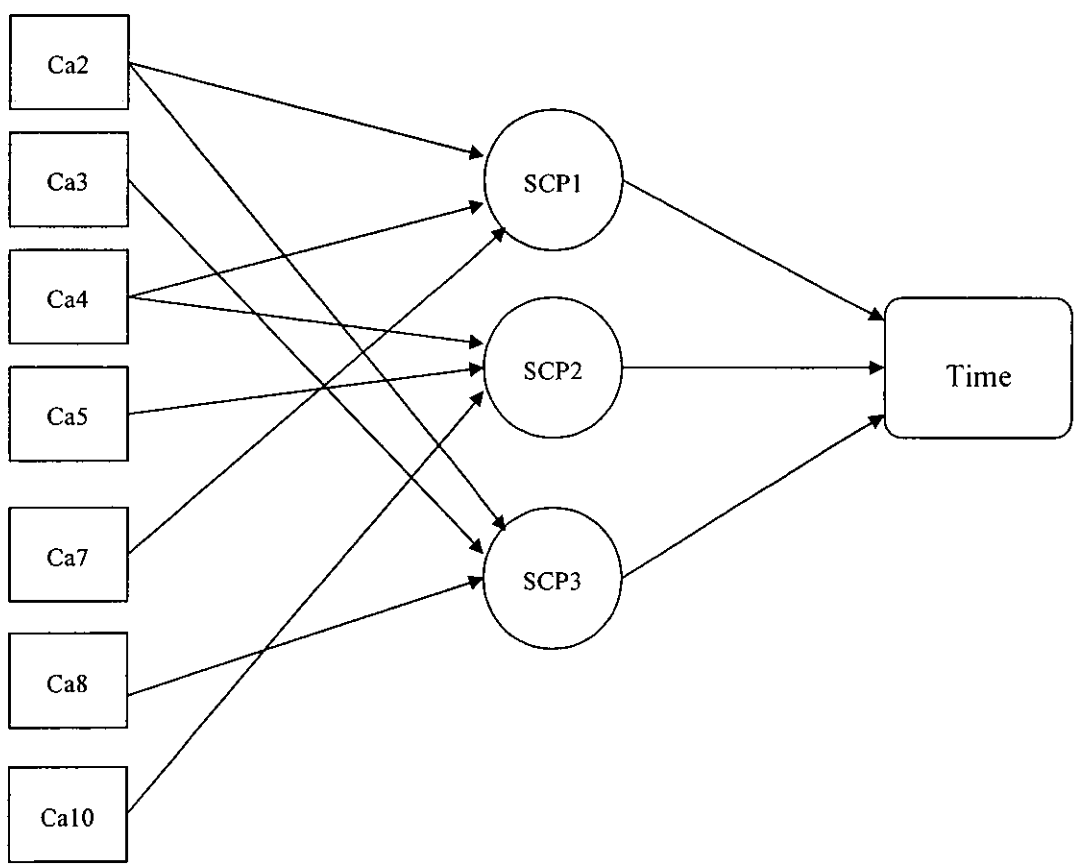

Figure 11.1: Linkage for time performance analysis of all types of subcontractors and structural work subcontractors

b. Linkage for cost performance analysis of all types of subcontractors

Figure 11.2 relates causes, site coordination problems and cost performance of all types of subcontractors. The figure shows that: Ca2, Ca3, Ca5, Ca7, Ca8 and Ca9 are the 'most essential' causes of problems SCP3 and SCP4; and these two problems in turn directly affect the cost performance of all types of subcontractors.

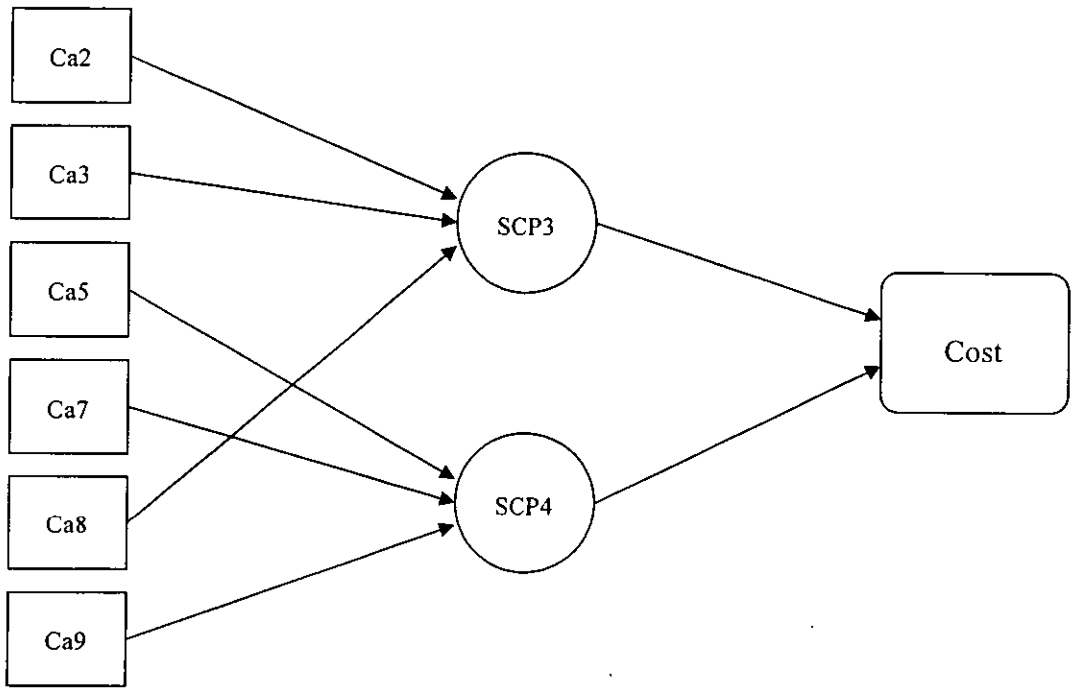

Figure 11.2: Linkage for the cost performance analysis of all types of subcontractors

c. Linkage quality performance analysis of all types of subcontractors

Figure 11.3 shows the relationships between causes, site coordination problems and the quality performance of all types of subcontractors. The figure demonstrates that: Ca2, Ca3, Ca4, Ca7 and Ca8 are the 'most essential' causes of problems SCP1 and SCP3; and these problems in turn directly affect the quality performance of all types of subcontractors.

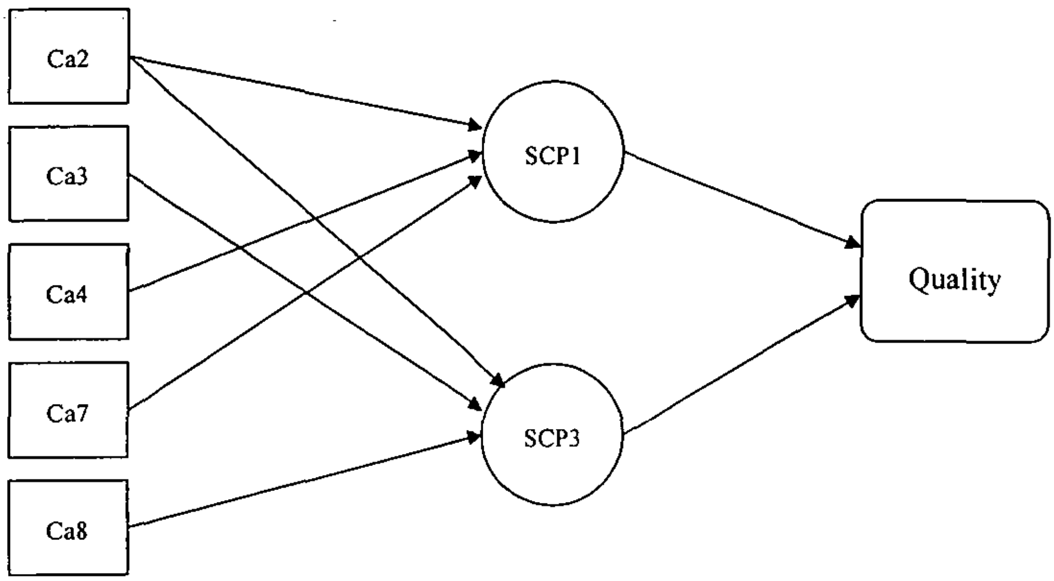

Figure 11.3: Linkage for quality performance analysis of all types of subcontractors

11.2.2 Analysis for finishing work subcontractors

a. Linkage for time performance analysis of finishing work subcontractors

Figure 11.4 shows the relationships between causes, site coordination problems and the time performance of finishing work subcontractors. The figure demonstrates that: the time performance of finishing work subcontractors is directly affected by SCP2, SCP4 and SCP6; and these three problems are mainly caused by Ca3, Ca4, Ca5, Ca7, Ca9 and Ca10.

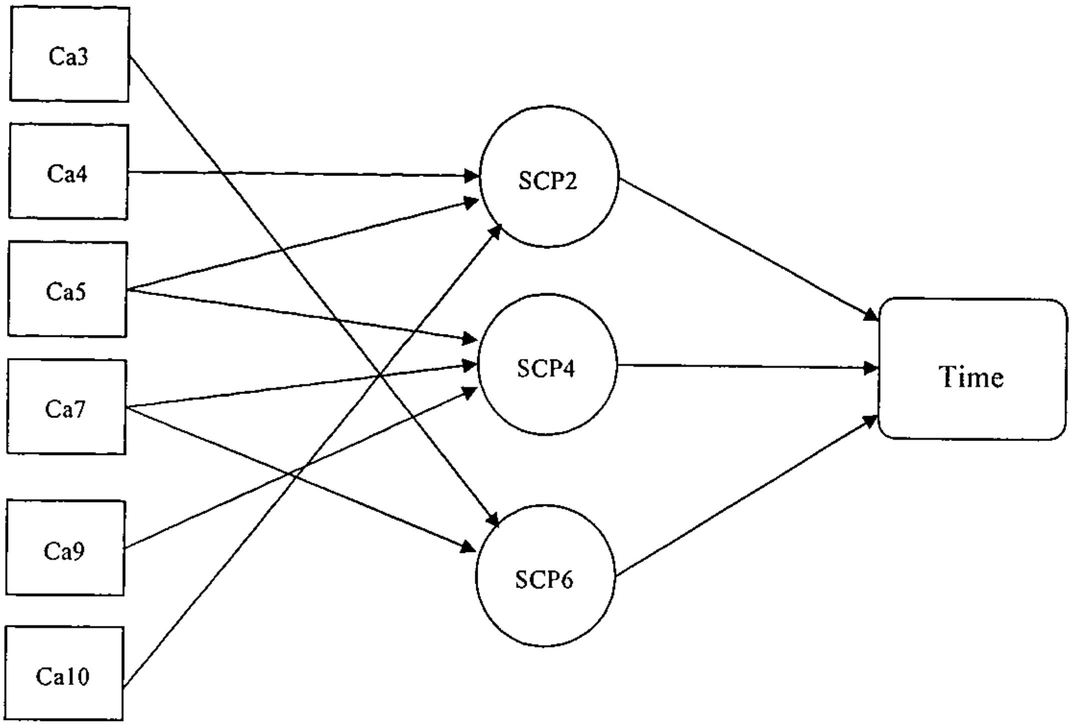

Figure 11.4: Linkage for time performance analysis of finishing work subcontractors

b. Linkage for cost performance analysis of finishing work subcontractors

Figure 11.5 relates causes, site coordination problems and the cost performance of finishing work subcontractors. The figure shows that: the cost performance of finishing work subcontractors is mainly influenced by one main site coordination problem, i.e. SCP4; which is mainly caused by Ca5, Ca7 and Ca9.

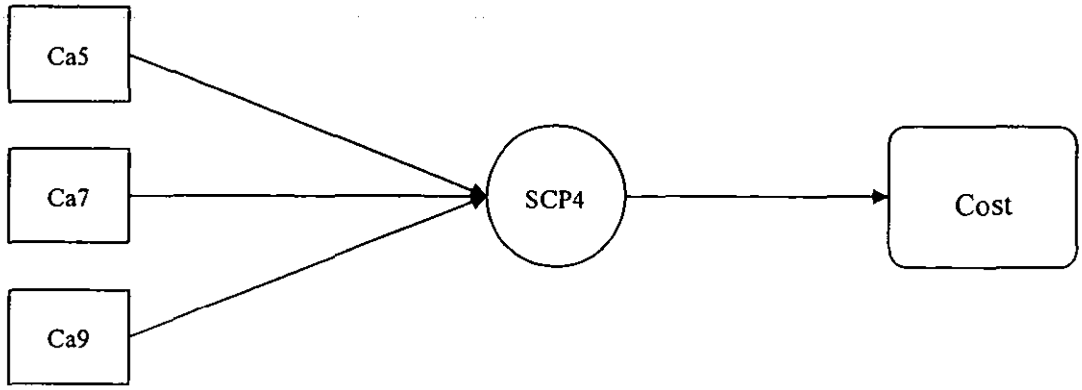

Figure 10.5: Linkage for cost performance analysis of finishing work subcontractors

c. Linkage for quality performance analysis of finishing work subcontractors

Figure 11.6 illustrates the relationship between, site coordination and the quality performance of finishing work subcontractors. The figure demonstrates that Ca4, Ca5, Ca7, Ca9 and Ca10 are the 'most essential' causes of problems SCP2 and SCP4 which then directly affect the quality performance of the subcontractors.

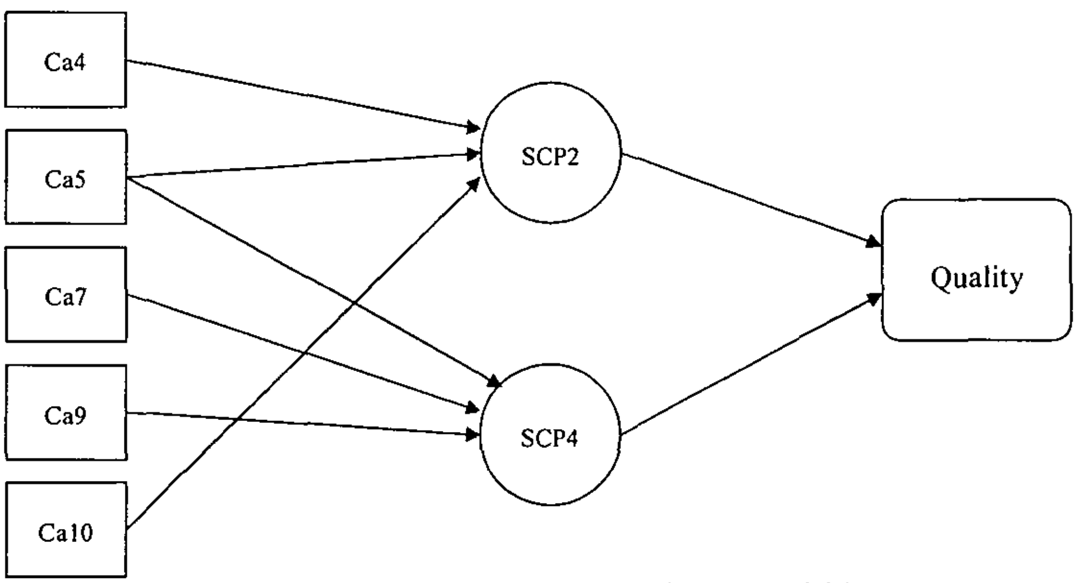

Figure 11.6: Linkage for quality performance analysis of finishing work subcontractors

11.2.3 Analysis for structural work subcontractors

a. Linkage for time performance analysis of structural work subcontractors

The linkage for time performance analysis of structural work subcontractors is the same as the linkage for time performance of all types of subcontractors as presented in Figure 11.1. Ca2, Ca3, Ca4, Ca5, Ca7, Ca8 and Ca10 are the main causes of problems SCP1, SCP2 and SCP3. These three problems in turn directly affect the time performance of structural work subcontractors.

b. Linkage for cost performance analysis of structural work subcontractors

Figure 11.7 shows the relationship between causes, site coordination problems and the cost performance of structural work subcontractors. The figure demonstrates that cost performance is mainly controlled by SCP2 caused by Ca4, Ca5 and Ca10.

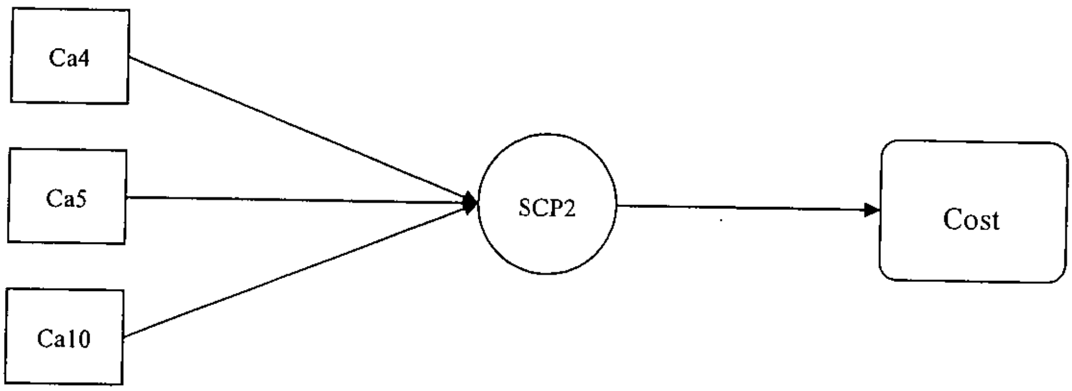

Figure 11.7: Linkage for cost performance analysis of structural work subcontractors

c. **Linkage for quality performance analysis of structural work subcontractors**

Figure 11.8 shows the relationship between causes, site coordination problems and the quality performance of structural work subcontractors. The figure demonstrates that Ca2, Ca3, Ca7 and Ca8 are the 'most essential' causes of problems SCP3 and SCP6. These problems directly affect the quality performance of the structural work subcontractors.

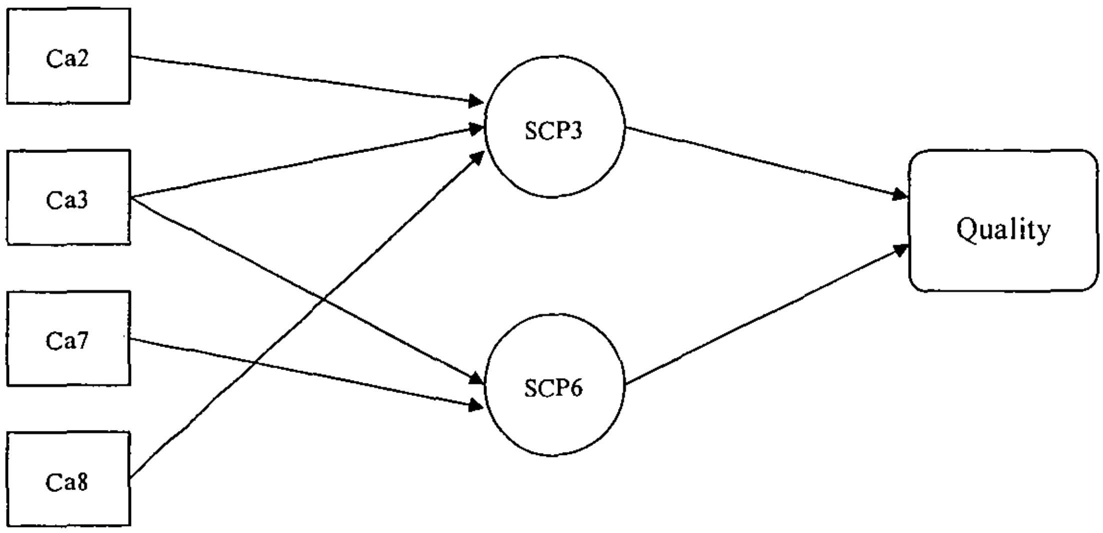

Figure 10.8: Linkage for quality performance analysis of structural work subcontractors

11.2.4 Analysis for building services work subcontractors

The linkages for the three project outcomes of building services subcontractors are the same as shown in Figure 11.9. Ca2, Ca3 and Ca8 are the 'most essential' causes contributing of problem SCP3 which in turn directly influences all the three project outcomes: time, cost and quality.

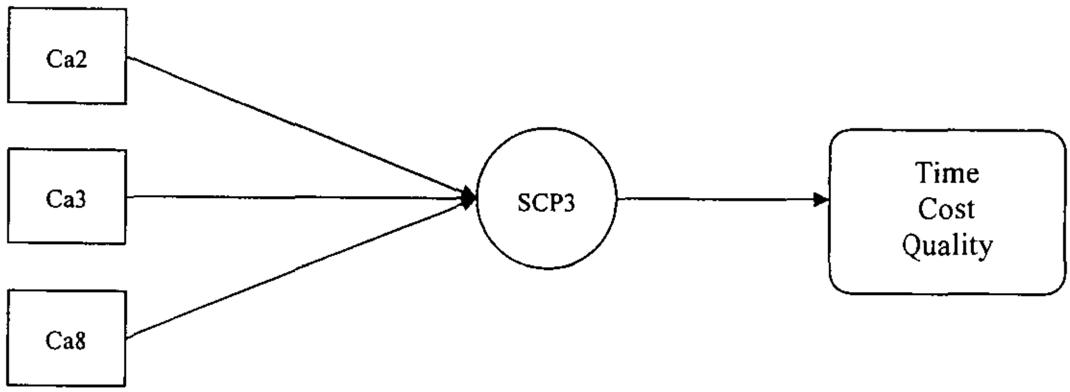

Figure 11.9: Linkage for the time, cost and quality performance analysis of building services work subcontractors

11.3 Summary

Some of the causes and problems are more important to different types of subcontractors. Figure 11.4 to Figure 11.9 illustrate how the 'most essential' causes contribute to the 'most critical' site coordination problems and subsequently influence the project outcomes of subcontracts for different types of subcontractors. These figures provide essential information to main contractors to formulate appropriate strategy to monitor the performances of different types of subcontractors.

Table 11.1 summarizes the 'most essential' causes, the 'most critical' site coordination problems and the respective project outcomes affected based on the data for all types of subcontractors. In order to enhance the site coordination, main contractors should focus their efforts on eliminating the causes, Ca2, Ca3, Ca4, Ca5, Ca7, Ca8, Ca9 and Ca10, in order to avoid the occurrence of problems, SCP1, SCP2, SCP3 and SCP4 according to the table.

Table 11.1: Summary of 'most essential' causes, 'most critical' site coordination problems and project outcomes

Causes	Problems	Project outcomes influenced
Staff the main contractor are too inexperienced to coordinate the site work (Ca2); Main contractor does not have sufficient directly employed workers to carry out the temporary work (Ca3); Job duties of main contractor's staff are unclear (Ca8)	Interfacing work not yet completed (SCP3)	Time, Quality, Cost
Staff the main contractor are too inexperienced to coordinate the site work (Ca2); Main contractor does not have sufficient staff to coordinate the site work (Ca4); Design of the temporary work provided by main contractor does not meet the requirements requested by the sub-contractors (Ca7)	Short notice to commence site work (SCP1)	Time, Quality,
Main contractor does not have sufficient staff to coordinate the site work (Ca4); Main contractor does not have sufficient staff to coordinate the technical administration work (Ca5); Frontline staff of main contractor do not have sufficient authority to handle the site co-ordination (Ca10)	Late to provide plant support (SCP2)	Time
Main contractor does not have sufficient staff to coordinate the technical administration work (Ca5); Design of the temporary work provided by main contractor does not meet the requirements requested by the sub-contractors (Ca7); Communication paths within main contractor organization are unclear (Ca9)	Interfacing work not accurately completed (SCP4)	Cost

Figure 11.10 constructs the link from the 'most essential' causes to the 'most critical' site coordination problems and then the respective project outcomes. The figure shows that

interfacing work not yet completed (SCP3) is the most important one among the four 'most critical' site coordination problems as it has direct influence to all the three project outcomes. Ca2, Ca4, Ca5 and Ca7 are more important than the other 'most essential' causes as they have direct influence to two 'most critical' site coordination problems. Among them, *staff the main contractor are too inexperienced to coordinate the site work* (Ca2) is the most important one as it influence SCP3 and subsequently all the three project outcomes.

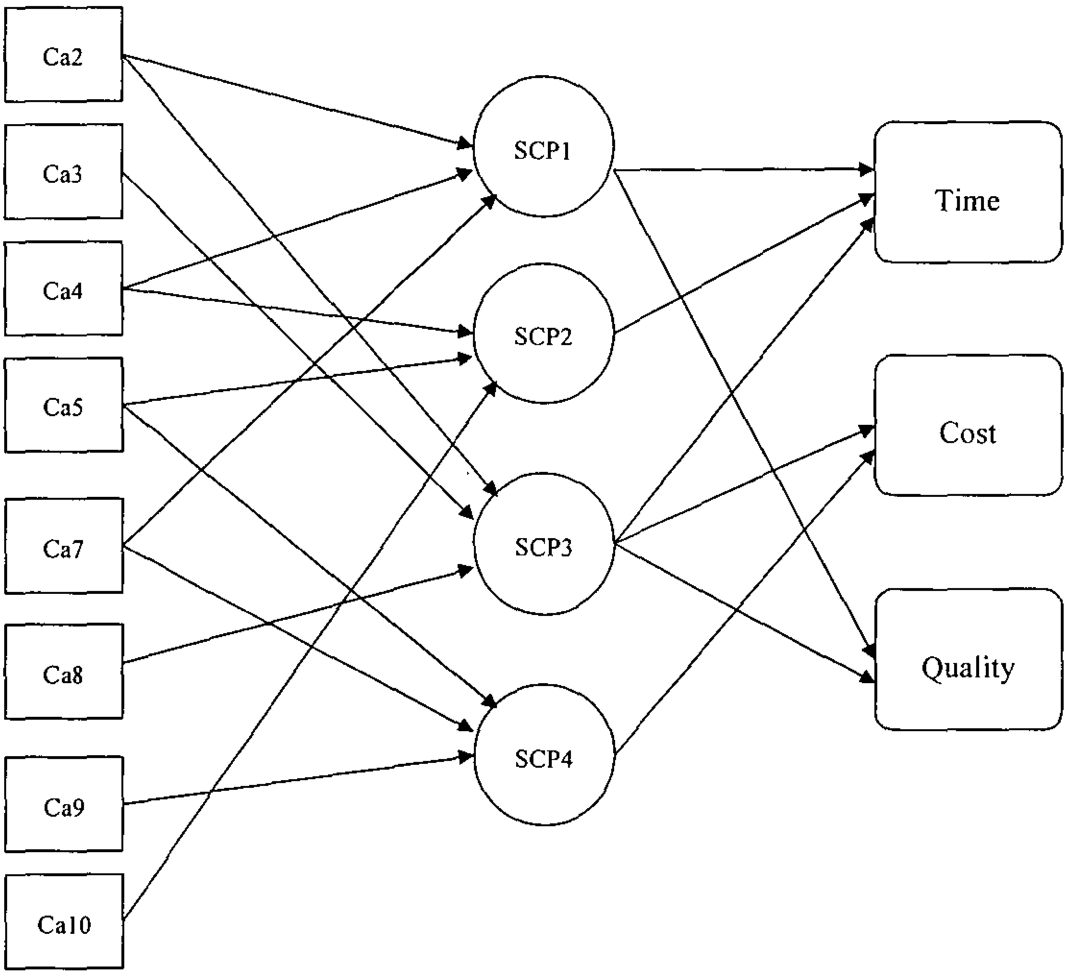

Figure 11.10: Linkage of subcontractor' performance analysis

CHAPTER TWELVE

CONCLUSIONS, RECOMMENDATIONS AND FURTHER RESEARCH

12.1 Introduction

The economy of Hong Kong is heavily dependent upon the state of the property and the construction industry. The construction industry employs about eight per cent of working population and contributes 3.4 per cent of Hong Kong's GDP according to government statistics for 2005 (Census and Statistics Department, 2006). Due to the rapid expansion of project size and fluctuation of workload, there is a high level of sub-contracting in the projects. The labour-only subcontractors and fee subcontractors contributed 23 per cent and 44 per cent of the gross value of construction work performed in 2005. However, there are increasing complaints from the subcontractors that they cannot perform their site work effectively and efficiently due to poor site coordination by main contractors. Research was conducted to develop relationships to explain how the site coordination problems caused by main contractors affect the performance of subcontractors at the construction stage and analyze the main causes of these problems. The aim of the research was divided into the following six objectives which were achieved through a series of questionnaire surveys and in-depth interviews.

a. Identify and review the common criteria to evaluate the performance of subcontractors currently used by the main contractors in HK building projects.

b. Identify and review the important factors governing the performance of subcontractors.

c. Identify and analyse the critical site coordination problems caused by main contractors that adversely affect the performance of subcontractors.

d. Identify and analyse the essential causes of the site coordination problems.

e. Investigate how the site coordination problems affect the performance of subcontractors.

f. Develop a framework and recommend actions to main contractors for improving site coordination.

Finally, four 'most critical' site coordination problems that have adverse impacts on the time, cost and quality performance of the subcontractors in the HK building project, and eight 'most essential' causes of these problems were identified and their relationships are shown in Figure 11.1 (see page 335). The following sections conclude how the objectives of this research have been achieved.

12.2 Conclusions

12.2.1 Performance evaluation of subcontractors

The role of main contractors on Hong Kong building projects has been gradually transformed from a constructor to a manager of subcontractors, consequently, the performance of subcontractors is one of the most important factors governing the project performance. In order to identify the project related factors influencing the outcomes of subcontracts, a questionnaire survey was conducted to identify the criteria that main contractors currently using to assess the performance of their subcontractors. A list of criteria grouped into the following seven categories of project objectives was prepared based on literature review and advices from industrial practitioners.

a. time;

b. safety and health;

c. quality;

d. cost;

e. potential for long term development;

f. sustainability; and

g. public image.

In the survey, respondents who had worked in main contracting firms were requested to rate the level of importance of the criteria. The survey results indicate that time is the most important criteria to evaluate the performance of subcontractors. The main reasons being that the clients would normally set very short contract durations for the local building projects due to high land price, and the performance in relation to this objective can easily be quantified. Main contractors thus set this as the top priority project objective and consequently the most important performance assessment criteria to their subcontractors. With the increasing public concerns on safety and health issues, this item has become as important as the other two traditional project objectives, cost and quality. The other three objectives selected for this survey are considered as less important objectives to subcontracts.

12.2.2 Factors governing the performance of subcontractors

There are numerous factors that can influence project outcomes such as site conditions, procurement system, and project organization etc. The factors governing the performance of subcontractors of HK building projects were identified and analyzed by adopting the in-depth interview method. A list of factors that could affect the performance of a subcontractor was developed based on the publications of the determinants of main contract outcomes. The factors were grouped in the following three categories by adopting the model developed by Tam and Harris (1996):

a. inherent project characteristics;

b. ability of the key participants; and

c. influence of the participants to the subcontractors.

Views from the construction managers and foremen of main contractors, and the project officers of subcontractors were gathered through in-depth interviews. With reference to the three main traditional project objectives, i.e. time, cost and quality, interviewees were requested to rate the level of importance to each of the causes of poor performance of the subcontractors and give a short explanation for their options. Table 12.1 shows the ten most important causes in a descending order of priority concluded in this survey.

Table 12.1: The ten most important causes

Rank	Causes
1	Payment to the subcontractors
2	Perceived profitability of the subcontracts
3	Level of coordination
4	Claims for extra works
5	Approval process
6	Design changes
7	Relationship among the participants
8	Incentive scheme
9	Schedule change
10	Staff support of the subcontractors

Subcontractors are generally small firms and may not have long-term planning and commitment to the industry. They often optimize their performance only if they can forecast a reasonable profit margin and can maintain a sound cash flow throughout the project. Level of coordination is the third important factors because effective and efficient site coordination by main the contractor can ensure that subcontractors perform their work at full capacity during the construction stage. Main contractor should also provide necessary assistance to the subcontractors to prepare the submission to claim for reimbursement for the extra work done. Frequent delays in shop drawing, material sample and test report approval, and frequent design and schedule change can cause unnecessary disturbance to subcontractors' work. Good relationships between the participants can cultivate the mutual trust atmosphere for the project. The amount of support from the subcontractors to the project can also affect the outcomes of sub-contracts. Finally, appropriate incentive schemes can motivate subcontractors to upgrade their performance.

12.2.3 Critical site coordination problems caused by main contractors

Main contractor's site coordination is the most important cause for the poor performance of subcontractors during the construction stage. The critical site coordination problems that have adverse impact to the time, cost and quality performances of subcontractors were identified and analyzed by adopting questionnaire survey method. Nineteen common site coordination problems were identified through literature review and advices from industrial practitioners. These were categorized into the following eight groups.

a. construction information;

b. working programme;

c. preparation for work place;

d. interfacing work to be completed by other subcontractors;

e. access to work place;

f. plant support;

g. material support; and

h. response to site problems.

In this survey, respondents were requested to rate the frequency of occurrence and the potential impact on subcontractors' performance of each of the problems. The survey results identified six most frequent problems on HK building projects. Problems relating to construction information and interfacing works were found to be the most frequent problems. Thirteen problems were identified as having significant impact to subcontractors' site works. *Site reference points and interfacing works* were found to have the most significant impact on subcontractors' performance. The level of importance of the problems to the performance of subcontractors was analysed by means of aggregated importance score which is taken as the combined scores of the frequency of occurrence and the potential degree of impact. The survey results show that six problems were regarded as critical site coordination problems. They are listed in Table 12.2 in the descending order of priority of their level of importance.

Table 12.2: The six critical site coordination problems

Rank	Site coordination problems
1	Construction information unclear or contradictory
2	Construction information not detail enough
3	Interfacing work not accurately completed
4	Interfacing work not yet completed
5	Late to provide plant support
6	Short notice to commence site work

12.2.4 Essential causes of the site coordination problems

Sixteen key causes leading to site coordination problems due to poor performance of main contractor in HK building projects were identified through literature review and advices from industrial practitioners. The causes were grouped into the following three categories:

a. staffing;

b. technical; and

c. management system.

A questionnaire survey was developed to analyse the essential causes leading site coordination problems. Respondents were requested to rate each identified causes in terms of their contributions to the problems and the frequency of occurrence in HK building projects. The survey results show that eleven causes were found to have a significant contribution on main contractor's site coordination problems. Thirteen causes were identified as frequently occurring on HK local building projects. Twelve causes were considered as the essential causes based on the aggregated importance score which is the combined score of frequency of occurrence and the degree of contribution of the cause. The results have been shown in Table 12.3 in a descending order of priority of their level of importance.

Table 12.3: The twelve essential causes of site coordination problems

Rank	Causes of site coordination problems
1	Unclear job duties
2	Staff too inexperienced to coordinate technical administration work
3	Unclear accountability system
4	Unclear communication path
5	Insufficient direct employed worker to carry out the temporary work
6	Insufficient authority for frontline staff
7	Staff too inexperienced to coordinate the site work
8	Insufficient technical support from head office
9	Too much paper work
10	Poor temporary work design
11	Insufficient staff to coordinate the site work
12	Insufficient staff to coordinate the technical administration work

12.2.5 Relationship to explain how site coordination problems affect the performance of subcontractors

A questionnaire survey was developed to formulate regression equations to explain how the performance of the subcontractors was affected by the occurrence of the six critical site coordination problems in HK building projects. SPSS software was used to generate the multiple regression equations. The analysis covered one main model for the three project outcomes separately. There were three sub-models for each of the main models for different types of subcontractors. The analysis generated 12 regression equations are summarized in Table 12.4.

Table 12.4: Regression equations for performance of subcontractors

Type of subcontractor	Regression equation
All types	Time = 11.645 - 0.229xSCP1 - 0.343xSCP2 - 0.314xSCP3 -0.031xSCP4 + 0.001xSCP5 - 0.068xSCP6
Finishing work	Time = 13.896 - 0.265xSCP1 - 0.429xSCP2 - 0.094x SCP3 - 0.300x SCP4 – 0.158xSCP5 - 0.194xSCP6
Structural work	Time = 12.299 - 0.350xSCP1 - 0.421xSCP2 - 0.420x SCP3 + 0.117x SCP4 + 0.119xSCP5 - 0.155xSCP6
Building services	Time = 8.906 - 0.075xSCP1 - 0.120xSCP2 - 0.498x SCP3 + 0.191x SCP4 - 0.047xSCP5 + 0.062xSCP6
All types	Cost = 9.522 + 0.015xSCP1 - 0.040xSCP2 - 0.308xSCP3 -0.162xSCP4 + 0.084xSCP5 - 0.087xSCP6
Finishing work	Cost = 11.013 - 0.155xSCP1 +.179xSCP2 - 0.277x SCP3 - 0.569xSCP4 – 0.016xSCP5 +0.098xSCP6
Structural work	Cost = 8.223 + 0.249xSCP1 - 0.371xSCP2 - 0.118x SCP3 + 0.065x SCP4 + 0.067xSCP5 - 0.043xSCP6
Building services	Cost = 8.858 + 0.067xSCP1 - 0.014xSCP2 - 0.535x SCP3 + 0.084x SCP4 - 0.002xSCSCP5 - 0.046xSCP6
All types	Quality = 10.564 – 0.160xSCP1 - 0.096xSCP2 - 0.283xSCP3 -0.094xSCP4 - 0.024xSCP5 - 0.002xSCP6
Finishing work	Quality = 10.902 - 0.153xSCP1 - 0.237xSCP2 - 0.031x SCP3 - 0.182xSCP4 – 0.107xSCP5 - 0.071xSCP6
Structural work	Quality = 11.676 - 0.117xSCP1 - 0.078xSCP2 - 0.423x SCP3 - 0.099xSCP4 - 0.001xSCP5 - 0.157xSCP6
Building services	Quality = 8.652 - 0.157xSCP1 - 0.038xSCP2 - 0.505x SCP3 + 0.104x SCP4 + 0.045xSCSCP5 + 0.129xSCP6

12.2.6 Contributions of the causes to the site coordination problems

A questionnaire survey was conducted to formulate regression equations to assess the contributions of the twelve essential causes to the six critical site coordination problems. SPSS software was used to compute the regression equations. Table 12.5 summaries the regression equations formulated based on the overall views from subcontractors, main contractors and clients/consultants for each critical site coordination problem.

Table 12.5: Regression equations for contributions of causes to site coordination problems

Site coordination problem	Regression equation
Short notice to commence site work (SCP1)	SCP1 = 2.115 + 0.086xCa1 + 0.223xCa2 – 0.026xCa3 + 0.073xCa4 + 0.077xCa5 - 0.054xCa6 + 0.126xCa7 - 0.017xCa8 - 0.028xCa9 + 0.051xCa10 + 0.037xCa11 - 0.016xCa12
Late to provide plant support (SCP2)	SCP2 = 1.187 – 0.007xCa1 + 0.046xCa2 + 0.081xCa3 + 0.122xCa4 + 0.133xCa5 + 0.010xCa6 + 0.011xCa7 + 0.050xCa8 - 0.050xCa9 + 0.141xCa10 + 0.055xCa11 - 0.068xCa12
Interfacing work not yet completed (SCP3)	SCP3 = 2.182 – 0.063xCa1 + 0.147xCa2 + 0.115xCa3 + 0.053xCa4 + 0.090xCa5 - 0.055xCa6 + 0.045xCa7 + 0.093xCa8 - 0.019xCa9 + 0.069xCa10 - 0.033xCa11 + 0.068xCa12
Interfacing work not accurately completed (SCP4)	SCP4 = 3.022 + 0.005xCa1 + 0.041xCa2 + 0.078xCa3 - 0.002xCa4 + 0.095xCa5 - 0.093xCa6 + 0.138xCa7 + 0.005xCa8 + 0.110xCa9 + 0.023xCa10 + 0.037xCa11 + 0.031xCa12
Construction information not detail enough (SCP5)	SCP5 = 3.536 + 0.025xCa1 - 0.093xCa2 + 0.112xCa3 - 0.013xCa4 + 0090xCa5 + 0.015xCa6 + 0.140xCa7 - 0.049xCa8 + 0.027xCa9 + 0.216xCa10 + 0.074xCa11 - 0.068xCa12
Construction information unclear or contradictory (SCP6)	SCP6 = 2.911 + 0.042xCa1 + 0.060Ca2 + 0.122xCa3 - 0.126xCa4 + 0074xCa5 - 0.015xCa6 + 0.196xCa7 - 0.067xCa8 + 0.031xCa9 + 0.050xCa10 + 0.046xCa11 + 0.054xCa12

12.3 Recommendations for improving site coordination

Among the six critical site coordination problems, some of them bear more impact to the three subcontract project outcomes. Adopting the backward elimination multiple regression analysis method, the 'most critical' problems to the performance of subcontractors were identified and summarized in Table 12.6. The table shows that SCP1, SCP2, SCP3 and SCP4 have the highest impact to the performance of subcontractors.

Table 12.6: Summary of 'most critical' site coordination problem and project outcomes influenced

'Most critical' site coordination problem	Project outcomes influenced
Interfacing work not yet completed (SCP3)	Time, Quality, Cost
Short notice to commence site work (SCP1)	Time, Quality,
Late to provide plant support (SCP2)	Time
Interfacing work not accurately completed (SCP4)	Cost

Similarly, the 'most essential' causes to the 'most critical' site coordination problems summarized in Table 12.7 were also identified by adopting the backward elimination method. Ca2, Ca3, Ca4, Ca5, Ca7, Ca8, Ca9 and Ca10 contribute most to the 'most critical' site coordination problems.

Based on the information of Table 12.7, the following actions are recommended which aim to avoid the occurrence of the 'most essential' causes of the 'most critical' site coordination problems so as to improve the site coordination to subcontractors.

Table 12.7: Summary of 'most essential' causes and 'most critical' site coordination problems

'Most essential' causes	'Most critical' site coordination problems
Staff the main contractor are too inexperienced to coordinate the site work (Ca2); Main contractor does not have sufficient directly employed workers to carry out the temporary work (Ca3); Job duties of main contractor's staff are unclear (Ca8)	Interfacing work not yet completed (SCP3)
Staff the main contractor are too inexperienced to coordinate the site work (Ca2); Main contractor does not have sufficient staff to coordinate the site work (Ca4); Design of the temporary work provided by main contractor does not meet the requirements requested by the sub-contractors (Ca7)	Short notice to commence site work (SCP1)
Main contractor does not have sufficient staff to coordinate the site work (Ca4); Main contractor does not have sufficient staff to coordinate the technical administration work (Ca5); Frontline staff of main contractor do not have sufficient authority to handle the site co-ordination (Ca10)	Late to provide plant support (SCP2)
Main contractor does not have sufficient staff to coordinate the technical administration work (Ca5); Design of the temporary work provided by main contractor does not meet the requirements requested by the sub-contractors (Ca7); Communication paths within main contractor organization are unclear (Ca9)	Interfacing work not accurately completed (SCP4)

12.3.1 Recruitment and on-the-job training

The job duties of project coordinator in the modern construction projects are not confined to a single discipline, but are generally multidisciplinary. Jha (2005) has identified 24 attributes of a capable project coordinator through literature review and the most important ones through a questionnaire survey. Based on these attributes, local main contractors can develop their own requirements with reference to the company culture and the characteristics of the project to recruit or assigned adequate experience staff to take the role of project coordinator. Besides, construction companies should establish regular staff development training programme to enable the staff to cope with the rapid development of the industry.

12.3.2 Informal meeting

Frontline staff will be frustrated if they are not delegated with full authority and support by top management to carry out the site coordination work. The problem will be solved unless the staff can identify a clear communication channel to feedback their difficulties. As a dynamic temporarily site organization is formed due to fluctuation of workload at different stage of project (Mohsini and Davidson, 1992), project manager may not able to define the full detail of the job specification of the frontline staff in terms of duties and authority etc as well as the communication. Thus on the top of the formal meetings, project managers should provide more informal meeting opportunities to frontline staff such as short discussion at tea time because participation through frequent group discussions could increase cooperation and team spirit and results in greater knowledge (Champagne *et al.*, 1987).

12.3.3 Partnership

Due to lack of long-term commitment of the subcontractors to the industry, there is limited trust between main contractor and subcontractors. The site problems are normally discussed at a win-lose climate. The HK main contractors should introduce the partnership approach in their projects. Through the active involvement of all key project parties, the project is more likely to be completed within budget, on time and with the least number of defects (Chan *et al.*, 2003). For instance, main contractors normally would design the temporary work mainly based on their experience and needs without paying much attention of the requirements from subcontractors. A profit sharing policy can be adopted through partnership approach such that subcontractors would be involved in finalizing the temporary work design. The cost saved in the temporary work would be shared by main contractor and subcontractors. As a result, unnecessary site coordination problems can be avoided.

12.3.4. Enhance the site team

Due to keep competition, the profit margins for the local building projects are generally low. In order to secure the profit, senior management of the main contractors would tend to sublet almost all their work to subcontractors including setting out work and general site cleaning work so as transfer most of the risk to subcontractors, and only maintain a very small team of site management staff and directly employed workers to carry out the emergency work. As a result, there is always insufficient staff to coordination the works and erect the temporary work for subcontractors. According to the finding of one of the surveys of this study, over 35 per cent of subcontractors' productivity was wasted due to site co-ordination problems caused by main contractors. The direct cost of the productivity waste would be taken up by subcontractors. Main contractors would need to bear the indirect cost such as increase in overhead expensive due to project time overrun.

12.4 Limitations of study

A model was developed in this research to link the causes to the site coordination problems and then to the outcomes of subcontracts in the HK building projects. The limitations of this research observed are discussed in the following paragraphs.

Questionnaire surveys were designed to identify the criteria to evaluate the performance of subcontractors, critical site coordination problems and essential causes to the problems. The number of replies for these surveys range from 27 to 36. The findings of these surveys would be more convincing if more replies are received.

As multiple regression analysis method was adopted to establish the relationship that assesses the impact of the critical site coordination problems to the outcomes of subcontracts, number of data for the analysis must be high enough to assure the reliability of the survey findings. Data collection on the achievements in time, cost and quality performance by means of questionnaire survey method would appropriate as sample size would definitely be larger than case study method. In the questionnaire, respondents were requested to assign a score from 10 (represent 100% achievement) to 0 (represent 0% achievement) with a 0.5 interval to represent their views on the level of achievements in these three project outcomes in their current projects. The data collected were thus of 'self-assessed' nature by the respondents. Fortunately, the impact of the 'subjectivity' to this research was alleviated as more that one hundred set of data were collected in the survey.

Two sets of multiple regressions that relate the causes to the problems and the problems to the project outcomes were established respectively in this research. The most important cause to the project outcomes was identified by examining the links shown in Figure 11.10 (page 333). However, the reliability of using the causes to forecast the project outcomes has not been investigated in this research. This can be achieved by means of path analysis.

12.5 Further research

There are several recommendations for further research derived from this study. These have been summarized below.

12.5.1 Path analysis

Path analysis is a statistic method that aims to provide estimates of the magnitude and significance of hypothesized causal connections between sets of variables. Further research could be formulated by adopting path analysis to investigate the feasibility of using the causes of the problems to forecast the subcontract project outcomes. In this analysis, causes affect outcomes through Link 1 and Link 2 indirectly and through Link 3 directly. The path coefficients (beta weights) of the regression equations of Link 1, Link 2 and Link 3 are computed. The effect of the indirect link is calculated by multiplying the path coefficients of Link 1 and Link 2. The effect of the direct link is the path coefficients of Link 3. The total effect of the causes to the outcomes is the sum of the direct effect and indirect effect as shown in Figure 12.1.

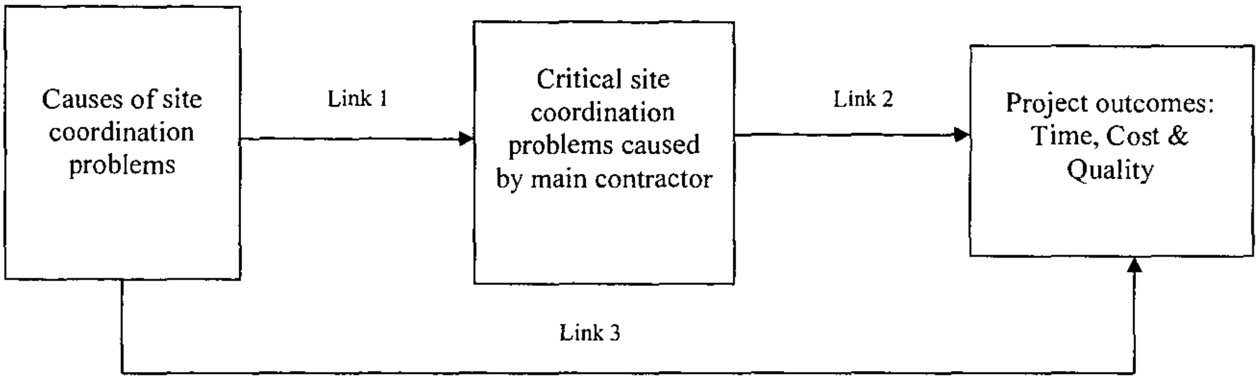

Figure 12.1: Proposed path analysis model

12.5.2 Different nature of work

This research covered the HK building projects. The study could be extended to different nature of work such as civil engineering project and large scale building alternation projects as main contractors of these projects also sublet significant amount of their work to subcontractors. The research methodology of this study can be adopted without demanding any major modification.

12.5.3 Different location

This research can be conducted for the projects at different countries. It is interesting to compare the results of different locations and investigate how they are affected by the culture and procurement system etc. The findings of the study would be the essential information for the international construction companies.

12.5.4 Further study for individual cause

The essential causes to the site coordination problems have been identified in this research. There are rooms for further study on the occurrence of each of the cause. For example, the occurrence of *the staff too inexperienced to co-ordinate technical administration work* may be due to poor staff recruitment system designed by the human resources department, the fault of the project manager and other reasons. Thus further study can be developed to analyze the 'causes' to each essential cause to the site coordination problems adopting the similar research methodology.

12.5.5 More project objective

This research covered the three traditional project objectives. Due to the rapid development in terms of complexity and size of HK building projects in the recent years, broader project objectives such as sustainable construction are being introduced. The scope of study of this research can be extended to cover more project objectives to cope with the latest development of the industry.

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APPENDIX A

Questionnaire for the survey on productivity waste, performance of subcontractors and contribution of the causes to the site coordination problem

INTRODUCTION

The aim of this questionnaire survey is to investigate how main contractors' site coordination problems affect the performance of the subcontractors and the causes of these problems in the Hong Kong building projects. Please spend a few minutes to complete the following questions

All information collected will be treated strictly confidential and used for academic study only.

Section A: General information

1. Nature of business of your company: (more than one box can be ticked)

- ☐ Main contractor:
  - ☐ Building construction work
  - ☐ Civil engineering work
  - ☐ Building maintenance work
  - ☐ Interior decoration work
- ☐ Subcontractor: Builder's work: specify your trade ______________
- ☐ Subcontractor: Building services work: specify your trade ________
- ☐ Consultancy: please specify your discipline ___________________
- ☐ Government or public utilities company
- ☐ Property developer
- ☐ Material supplier: please specify the trade____________________
- ☐ Other (please specify) ________________________________

2. Approximate number of staff being employed by your firm now: __________

3. Your current position in your company: ____________________________

4. Your years of experience in building construction industry:______________

If you are working in a firm performing the subcontractor role in a building project, please complete **ALL SECTIONS.**

If not, please complete **SECTION B, SECTION D and SECTION E ONLY**

SECTION B: Productivity waste

If you are working in subcontractors, please answer questions 5a based on your current project or the project with highest contract sum if you are handling several projects at the same time.

If you are not working in subcontractors, please answer 5b based on your working experience.

5a. Do you agree that your firm is unable to carry out site work effectively and efficiently due to poor site coordination by the main contractor of your project?

☐ Yes: Please assign a per cent (%) to represent your view on the amount of your productivity that has been wasted due to poor site coordination by the main contractor of your project: __________ (%)

☐ No

5b. Do you agree that subcontractors are unable to carry out site work effectively and efficiently due to poor site coordination by the main contractors?

☐ Yes: Please assign a per cent (%) to represent your view on the amount of your productivity that has been wasted due to poor site coordination by the main contractor of your project: __________ (%)

☐ No

SECTION C : Outcomes of your current project

(for respondents working in subcontractors only)

6. Compare with your project working plan, please assign a score from 10 (represent 100% achievement to your target) to 0 (0 represent 0% achievement to your target) with 0.5 intervals to represent your views on the level of achievement of the project objectives listed in Table 1 of your current project at the present moment.

Table 1

	Project objectives	Score
6a	Time	
6b	Cost	
6c	Quality	

SECTION D: Site coordination problems caused by main contractors

7. Please assign a score from 10 (occurred in every site operation) and to 0 (never occurred in site operation) with 0.5 intervals to represent your view on the frequency of occurrence of the site coordination problems listed in Table 2 caused by main contractor in your project.

Table 2

	Site coordination problems caused by main contractor	Score
7a	Short notice to commence site work	
7b	Late to provide plant support	
7c	Interfacing work not yet completed	
7d	Interfacing work not accurately completed	
7e	Construction information not detail enough	
7f	Construction information unclear or contradiction	

SECTION E : Causes of site coordination problems

8. Please assign a score from 10 (totally agree) and to 0 (totally disagree) with 0.5 intervals to represent your views on the contributions of the causes listed in Table 3 to the occurrence of the site coordination problems listed in Table 2.

Table 3

	Causes of site co-ordination problems caused by main contractor of your project	**Score**
8a	Staff of the main contractor are too inexperienced to co-ordinate the technical administration work.	
8b	Staff of the main contractor are too inexperienced to co-ordinate the site work.	
8c	Main contractor does not have sufficient directly employed workers to carry out the temporary work.	
8d	Main contractor does not have sufficient staff to co-ordination the site work.	
8e	Main contractor does not have sufficient staff to coordination the technical administration work.	
8f	Main contractor does not have sufficient technical support from the head office.	
8g	Design of the temporary work provided by main contractor does not meet the requirements requested by the sub-contractors.	
8h	Job duties of the main contractor's staff are unclear.	
8i	Communication paths within the main contractor organization are unclear.	
8j	Frontline staff of main contractor do not have sufficient authority to handle the site coordination.	
8k	Accountability systems within the main contractor organization are unclear	
8l	Main contractor's site coordination system demands too much paper work	

- End -

APPENDIX B

Data of the survey on productivity waste

Data for the survey on productivity waste

Reply no.	Role	Trade	Working experience (yrs)	% of waste
1	sub-contractor	building service work	4.0	60%
2	sub-contractor	building service work	13.0	50%
3	sub-contractor	structural work	2.0	70%
4	sub-contractor	building service work	15.0	55%
5	main contractor	building work	10.0	25%
6	sub-contractor	building service work	8.0	40%
7	sub-contractor	finishing work	1.0	80%
8	sub-contractor	finishing work	6.0	30%
9	sub-contractor	structural work	14.0	50%
10	sub-contractor	structural work	11.0	50%
11	main contractor	building work	18.0	0%
12	sub-contractor	building service work	3.0	60%
13	sub-contractor	structural work	2.0	65%
14	sub-contractor	structural work	9.0	50%
15	sub-contractor	structural work	6.0	20%
16	sub-contractor	finishing work	5.0	50%
17	sub-contractor	finishing work	4.0	80%
18	sub-contractor	structural work	12.0	60%
19	sub-contractor	finishing work	1.0	50%
20	sub-contractor	finishing work	7.0	50%
21	sub-contractor	structural work	9.0	40%
22	sub-contractor	finishing work	3.0	60%
23	sub-contractor	structural work	6.0	70%
24	sub-contractor	building service work	10.0	60%
25	sub-contractor	finishing work	7.0	40%
26	sub-contractor	finishing work	4.0	50%
27	sub-contractor	structural work	3.0	80%
28	sub-contractor	building service work	8.0	20%
29	sub-contractor	structural work	16.0	60%
30	sub-contractor	structural work	11.0	65%
31	sub-contractor	structural work	13.0	70%
32	sub-contractor	finishing work	2.0	65%
33	sub-contractor	finishing work	8.0	50%
34	main contractor	building work	19.0	10%
35	sub-contractor	finishing work	1.0	55%
36	sub-contractor	structural work	7.0	45%
37	sub-contractor	building service work	12.0	50%
38	sub-contractor	structural work	15.0	60%
39	sub-contractor	building service work	7.0	60%
40	sub-contractor	building service work	13.0	70%
41	sub-contractor	structural work	2.0	40%
42	sub-contractor	building service work	7.0	75%
43	sub-contractor	finishing work	3.0	60%
44	sub-contractor	building service work	1.0	55%
45	sub-contractor	structural work	6.0	70%
46	sub-contractor	structural work	4.0	60%
47	sub-contractor	building service work	9.0	35%
48	sub-contractor	building service work	8.0	50%
49	sub-contractor	building service work	7.0	80%

50	sub-contractor	building service work	16.0	60%
51	sub-contractor	structural work	3.0	55%
52	sub-contractor	structural work	2.0	40%
53	sub-contractor	finishing work	1.5	60%
54	sub-contractor	structural work	2.0	75%
55	sub-contractor	finishing work	9.0	70%
56	sub-contractor	finishing work	5.0	60%
57	sub-contractor	building service work	6.0	50%
58	sub-contractor	structural work	7.0	40%
59	sub-contractor	structural work	9.0	70%
60	sub-contractor	structural work	14.0	55%
61	main contractor	building work	21.0	30%
62	sub-contractor	building service work	7.0	60%
63	sub-contractor	building service work	6.0	55%
64	sub-contractor	structural work	11.0	40%
65	sub-contractor	building service work	7.0	60%
66	consultant/property developer	property developer	10.0	60%
67	sub-contractor	building service work	10.0	60%
68	main contractor	building work	10.0	0%
69	consultant/property developer	property developer	20.0	80%
70	consultant/property developer	property developer	18.0	80%
71	consultant/property developer	consultancy	15.0	25%
72	main contractor	building work	13.0	20%
73	sub-contractor	finishing work	10.0	90%
74	main contractor	building work	17.0	30%
75	main contractor	building work	18.0	20%
76	consultant/property developer	consultancy	15.0	50%
77	main contractor	building work	12.0	25%
78	main contractor	building work	10.0	20%
79	main contractor	building work	18.0	50%
80	sub-contractor	finishing work	15.0	90%
81	main contractor	building work	10.0	40%
82	sub-contractor	finishing work	20.0	13%
83	main contractor	building work	10.0	0%
84	consultant/property developer	consultancy	8.0	70%
85	sub-contractor	building service work	20.0	13%
86	main contractor	building work	12.0	0%
87	sub-contractor	building service work	15.0	25%
88	main contractor	building work	20.0	0%
89	main contractor	building work	9.0	70%
90	sub-contractor	building service work	3.0	40%
91	consultant/property developer	consultancy	12.0	40%
92	main contractor	building work	10.0	30%
93	main contractor	building work	10.0	0%
94	consultant/property developer	consultancy	12.0	70%
95	main contractor	building work	8.0	0%
96	consultant/property developer	property developer	12.0	0%
97	sub-contractor	building service work	6.0	40%
98	sub-contractor	building service work	25.0	60%
99	main contractor	building work	8.0	30%
100	sub-contractor	finishing work	15.0	70%
101	sub-contractor	building service work	14.0	50%
102	sub-contractor	finishing work	3.0	30%
103	sub-contractor	finishing work	27.0	15%
104	sub-contractor	finishing work	15.0	10%

105	sub-contractor	finishing work	1.0	30%
106	sub-contractor	building service work	8.0	10%
107	sub-contractor	building service work	10.0	20%
108	sub-contractor	structural work	25.0	0%
109	sub-contractor	building service work	6.0	15%
110	sub-contractor	finishing work	10.0	25%
111	sub-contractor	finishing work	13.0	30%
112	main contractor	building work	19.0	0%
113	sub-contractor	finishing work	3.0	20%
114	main contractor	building work	10.0	0%
115	main contractor	building work	11.0	20%
116	main contractor	building work	20.0	50%
117	main contractor	building work	10.0	30%
118	sub-contractor	finishing work	3.0	15%
119	consultant/property developer	consultancy	3.0	15%
120	main contractor	building work	10.0	30%
121	main contractor	building work	20.0	20%
122	consultant/property developer	property developer	15.0	0%
123	main contractor	building work	10.0	0%
124	consultant/property developer	property developer	6.0	50%
125	sub-contractor	finishing work	10.0	0%
126	main contractor	building work	18.0	0%
127	consultant/property developer	property developer	22.0	0%
128	consultant/property developer	property developer	10.0	40%
129	main contractor	building work	10.0	20%
130	consultant/property developer	property developer	15.0	30%
131	consultant/property developer	property developer	8.0	0%
132	consultant/property developer	property developer	6.0	30%
133	sub-contractor	building service work	15.0	30%
134	consultant/property developer	property developer	10.0	30%
135	sub-contractor	structural work	10.0	0%
136	consultant/property developer	property developer	8.0	50%
137	sub-contractor	finishing work	11.0	0%
138	sub-contractor	finishing work	8.0	0%
139	sub-contractor	finishing work	15.0	20%
140	sub-contractor	structural work	10.0	50%
141	main contractor	building work	5.0	0%
142	sub-contractor	building service work	3.0	0%
143	sub-contractor	building service work	6.0	0%
144	sub-contractor	building service work	15.0	10%
145	sub-contractor	building service work	18.0	7%
146	sub-contractor	finishing work	22.0	5%
147	sub-contractor	finishing work	8.0	20%
148	sub-contractor	structural work	25.0	0%
149	sub-contractor	building service work	20.0	5%
150	sub-contractor	finishing work	1.0	0%
151	main contractor	building work	12.0	30%
152	sub-contractor	building service work	3.0	0%
153	sub-contractor	finishing work	23.0	30%
154	sub-contractor	structural work	20.0	25%
155	consultant/property developer	property developer	15.0	0%
156	sub-contractor	finishing work	26.0	25%
157	main contractor	building work	13.0	0%
158	main contractor	building work	9.0	30%
159	main contractor	building work	20.0	0%

160	main contractor	building work	1.0	0%
161	sub-contractor	finishing work	3.0	15%
162	main contractor	building work	4.0	0%
163	main contractor	building work	23.0	13%
164	consultant/property developer	property developer	10.0	70%
165	main contractor	building work	15.0	40%
166	sub-contractor	building service work	8.0	80%
167	main contractor	building work	4.0	50%
168	main contractor	building work	18.0	60%
169	sub-contractor	building service work	12.0	60%
170	sub-contractor	structural work	15.0	10%
171	main contractor	building work	13.0	80%
172	consultant/property developer	property developer	6.0	50%
173	consultant/property developer	property developer	10.0	80%
174	consultant/property developer	property developer	5.0	4%
175	consultant/property developer	consultancy	10.0	60%
176	main contractor	building work	20.0	50%
177	main contractor	building work	8.0	0%
178	main contractor	building work	4.0	20%
179	main contractor	building work	25.0	30%
180	main contractor	building work	10.0	20%
181	sub-contractor	finishing work	22.0	60%
182	sub-contractor	finishing work	8.0	20%
183	sub-contractor	structural work	12.0	30%
184	main contractor	building work	10.0	30%
185	main contractor	building work	10.0	0%
186	sub-contractor	finishing work	5.0	35%
187	sub-contractor	finishing work	4.0	40%
188	sub-contractor	finishing work	2.0	20%
189	main contractor	building work	15.0	20%
190	sub-contractor	structural work	6.0	20%
191	main contractor	building work	1.0	0%
192	main contractor	building work	12.0	0%
193	main contractor	building work	7.0	30%
194	sub-contractor	structural work	3.0	25%
195	main contractor	building work	9.0	0%
196	main contractor	building work	8.0	20%
197	sub-contractor	building service work	4.0	10%

APPENDIX C

Questionnaire for the survey on criteria to assess the performance of subcontractors

INTRODUCTION

The aim of this questionnaire survey is to identify the essential criteria that main contractors are currently using to evaluate the performance of their subcontractors. If you are working in **Main Contractors** for the Hong Kong building projects, please spend a few minutes to complete the following questions

All information collected will be treated strictly confidential and used for academic study only.

1. Your current position in your company: ______________________________

2. Your years of experience in building construction industry: ________________

3 Please rate the level of importance from 1 (very important) to 7 (very unimportant) with 0.5 intervals to the criteria listed in Table 1 used to evaluate the performance of the subcontractors in your projects.

Table 1

Item	Performance evaluation criteria	Score 1 (very important) to 7 (very unimportant)
a	Progress of work follow schedule	
b	Propose method to speed up progress	
c	Follow safety rules	
d	Propose method to eliminate potential danger to workers	
e	Quality of work comply with specification	
f	Quality of work comply with trade standard	
g	Amount of claims to main contractors	

h	Contributions on reducing construction cost	
i	Application of advance technology	
j	Relationship with site representatives of the client/design team	
k	Relationship with other sub-contractors	
l	Relationship with your staffs	
m	Administrative issues such as submission of records, sample, shop drawings	
n	Availability of additional resources	
o	Suggestions to improve the design in terms of buildability	
p	Suggestions to improve the design in terms of durability	
q	Suggestions to improve the design in terms of maintainability	
r	Amount of nuisance such as duct, noise, vibration etc generated	
s	Amount of construction waste generated	
t	Material wastage level	
u	Site tidiness	
v	Worker's working uniform	

Thank you for your help.

- End -

APPENDIX D

Questionnaire for the survey on critical site coordination problems

INTRODUCTION

The aim of this questionnaire survey is to identify the critical site co-ordination problem caused by main contractors that can hinder the performance of subcontractors in the local building projects.

All information collected will be treated strictly confidential and used for academic study only.

1. Nature of business of your company: (more than one box can be ticked)

   - ☐ Main contractor:
     - ☐ Building construction work
     - ☐ Civil engineering work
     - ☐ Building maintenance work
     - ☐ Interior decoration work
   - ☐ Subcontractor: Builder's work: specify your trade ______________
   - ☐ Subcontractor: Building services work: specify your trade _________
   - ☐ Consultancy: please specify your discipline __________________
   - ☐ Government or public utilities company
   - ☐ Property developer
   - ☐ Material supplier: please specify the trade____________________
   - ☐ Other (please specify) _________________________________

2. Your current position in your company: ___________________________

3. Your years of experience in building construction industry:______________

4. Please give scores for the frequency of occurrence and potential impact to site work in the local building project for each of the site coordination problems listed in Table 1 by adopting the following 9-point scoring system:
   1. from 1 (never happen) to 9 (happen every time) with a 0.5 interval for the frequency of occurrence in local building projects; and
   2. from 1 (very unimportant) to 9 (very important) with a 0.5 interval for degree of potential impact to site work in the local building projects.

Table 1: Site coordination problems adversely affected subcontractor's performance

Question		Score (Frequency)	Score (Potential Impact)
a	construction information not detail enough		
b	unclear or contradictory construction information		
c	working programme not detail enough		
d	working sequence not practical		
e	short notice for commencing site work		
f	late change of working programme		
g	work place environment not yet prepared such as general site cleaning, fresh air supply, lighting		
h	inadequate or insufficient site reference points		
i	inadequate or insufficient temporary work support such as scaffolding, water & power supply		
j	interfacing work not yet completed		
k	interfacing work not accurately completed		
l	access road to work place not yet ready		
m	access routing to work place not convenient		
n	late to provide plant support		
o	type of plant provided not appropriate		
p	insufficient amount of construction material		
q	type of material provided not appropriate		
r	late response to site problems		
s	solution recommended to solve site problems not practical		

Thank you for your help

APPENDIX E

Questionnaire for survey on essential causes for site coordination problems

INTRODUCTION

The aim of this questionnaire survey is to identify the essential cause of the site coordination problems caused by main contractors that can hinder the performance of subcontractors in the local building projects.

All information collected will be treated strictly confidential and used for academic study only.

1. Nature of business of your company: (more than one box can be ticked)

   - ☐ Main contractor:
     - ☐ Building construction work
     - ☐ Civil engineering work
     - ☐ Building maintenance work
     - ☐ Interior decoration work
   - ☐ Subcontractor: Builder's work: specify your trade ________________
   - ☐ Subcontractor: Building services work: specify your trade _________
   - ☐ Consultancy: please specify your discipline _____________________
   - ☐ Government or public utilities company
   - ☐ Property developer
   - ☐ Material supplier: please specify the trade______________________
   - ☐ Other (please specify) ______________________________________

2. Your current position in your company: ______________________________

3. Your years of experience in building construction industry:________________

4. Please give scores for the frequency of occurrence and potential impact to site work in the local building project for each of the site co-ordination problems listed in Table 1by adopting the following 9-point scoring system:
   i. from 1 (never happen) to 9 (happen every time) with a 0.5 interval for the frequency of occurrence in local building projects; and
   ii. from 1 (very unimportant) to 9 (very important) with a 0.5 interval for degree of potential impact to site work in the local building projects.

Table 1: Causes of site coordination problems

Question		Score (Frequency)	Score (Contribution)
a	unclear job duties		
b	unclear communication path		
c	insufficient authority for frontline staff		
d	unclear accountability system		
e	too much paper work		
f	insufficient technical support from head office		
g	poor temporary work design		
h	insufficient site office space		
i	poor site layout		
i	poor project programme or phasing of work		
k	staff too inexperienced to coordinate technical administration work		
l	frequent change of personnel		
m	staff too inexperienced to coordinate the site work		
n	insufficient directly employed worker to carry out the temporary work		
o	insufficient staff to coordinate the site work		
p	insufficient staff to coordinate the technical administration work		

Thank you for your help.

- End -

APPENDIX F

Details of the interviews for the surveys on performance assessment criteria, critical site coordination problems and essential causes to the problems

Flow of the interviews to experienced industrial practitioners on the preliminary list of performance assessment criteria, site coordination problems and causes to the problems

Stage	Time allocated (Minutes)	Item to discuss
1	2	Introduction to the aim of the interview.
2	10	Completeness of the preliminary list of the performance assessment criteria.
3	5	Grouping of the performance assessment criteria.
4	10	Completeness of the preliminary list of the common site coordination problems.
5	5	Grouping of the common site coordination problems.
6	10	Completeness of the preliminary list on key causes of site coordination problems.
7	5	Grouping of the key causes of site coordination problems.

Details of the interviewees

1. **Construction manager**

a. Mr. Percy Chan
Project Manager of Gammon Construction Ltd.

b. Mr. Y. K. Lau
Construction Manager of Wan Chung Construction Co. Ltd.

2. **Foreman**

a. Felix Chan
Paul Y. General Contractors Ltd.

b. Mr. Anson Chan
Hip Hing Construction Co. Ltd..

3. **Sub-contractors**

a. Mr. Cheng Tak Man
Shun Cheong Electrical Engineering Co. Ltd.
Trade: building services

b. Mr. Rocky Yeung
Woods Contracting Ltd.
Trade: masonry

4. **Consultant**

a. Mr. Paul Lam
Brighspect Limited
(Authorized Persons, Chartered Suveyors)

APPENDIX G

Details of the interviews for identifying the factors governing the performance of subcontractors

Flow of the interviews to experienced industrial practitioners on the factors governing the performance of subcontractors

Stage	Time allocated (Minutes)	Item to discuss
1	5	Introduction to the aim of the interview and remind interviewees to refer the discussion on time, cost and quality performance only.
2	5	Explain the principle in classifying the success factors into three categories.
3	5	Discussion on definition of success factors and the scoring system for the survey.
4	20	Discussion on the factors of the inherent sub-contract project characteristics group. Assign score for each factor.
5	20	Discussion on the factors of the ability of participants of the sub-contracts group. Assign score for each factor.
6	20	Discussion on the factors of the influences of the key participants to the sub-contracts during the construction stage. Assign score for each factor.
7	5	Add the score and identify the ten most critical factors.
8	15	Interviewees to confirm the score for the ten most critical factors and conclude the discussion

Detail of the interviewees

1. Construction manager

a. Mr. Cliff Leung
Assistant Project Manager of Gammon Construction Ltd

b. Mr. K. K. Lo
Construction Manager of Dickson Construction Ltd

c. Mr. Philip Siu
Senior Project Manager of Paul Y. General Contractors Ltd.

2. Foreman

a. Mr. Keith Lam
China Resources Construction Company Ltd

b. Mr. Hui Chak Ming
Yau Lee Construction Co. Ltd.

c. Mr. Chui Kwun Ching
Hip Hing Construction Company Ltd

3. Sub-contractors

a. Mr. Li Chi Wah
Li Wah Construction & Engineering Co. Ltd.
Trade: metal work

b. Mr. Lau Wing Hung
Li Wah Construction & Engineering Co. Ltd.
Trade: masonry

c. Mr. Mr. Sam S. K. Choi
Sundart Door & Flooring Installation Ltd.
Trade: carpentry

APPENDIX H

Mailing address for the questionnaire survey on productivity waste, the performance of subcontractors and the causes of the site coordination problems

Mailing address list for questionnaire survey

Case	Company address
1	A G Wilkinson & Associates Unit 2701, 27/F The Center 99 Queen's Road Central, HK
2	Accurate Contractors & Renovators Co 1302 Hoi Luen Industrial Centre Block B, 55 Hoi Yuen Road, Kwun Tong Kowloon
3	AD +RG 1002,111 Leighton Road, Causeway Bay, HK
4	ADC Engineering Trading Co., Ltd Unit-F, 3/F, Freder Centre, 3 Mok Cheong St, Tokwawan, Kowloon
5	Aedas Ltd 19/F, 1063 King's Road, Quarry Bay, HK
6	AGC Design Ltd 1601 Olympia Plaza, 255 King's Rd, HK
7	Alliance Contracting Co Ltd Unit 5, 8/F, Po Lung Centre, Block A, 11 Wang Chiu Road Kowloon Bay Kowloon
8	American Fire Engineering Ltd 13/F Po Sang Bank Building, 33 Argyle Street Mong Kok Kowloon
9	Arnhold & Co Ltd (Engineering Business Unit) 6/F Victoria Centre,15 Watson Road, North Point Hong Kong
10	Asia Construction Co 2015-17 Metro Centre II, 21 Lam Hing Street, Kowloon Bay Kowloon
11	Asian Construction Co 10/F Yun Tat Commercial Building Unit B, 72 Wuhu Street, Hung Hom Kowloon
12	ATAL Engineering Ltd 17/F Java Commercial Centre, 128 Java Road, North Point Hong Kong
13	ATKINS China Ltd 15/F Miramar Tower, 132 Nathan Road, Tsim Sha Tsui Kowloon
14	Babtie Asia Ltd 15/F Cornwall House, Taikoo Place, 979 King's Road, Quarry Bay, HK
15	Bachy Soletanche Group Ltd 3/F, Harcourt House, 39 Gloucester Road, Wanchai, HK
16	Barbican Construction Co Ltd 27/F New World Tower,16-18 Queen's Road Central, Central Hong Kong
17	Bauxon (China) Limited 25/F SUP Tower, 75-83 King's Rd, North Point, HK
18	Best Billion Engineering Ltd 1207-8 Ming Pao Industrial Centre Block B, 18 Ka Yip Street, Chai Wan Hong Kong
19	Biwater Man Lee Ltd Suite 202, Block 1, Hofai Commercial Centre, 218 Sai Lau Kok Rd., Tsuen Wan, NT
20	Bolton Construction Co Ltd 4D HK Spinners Industrial Building Phase 5, 760-762 Cheung Sha Wan Road, Kowloon
21	Bordon Construction Co Ltd 10/F Central Building, 3 Pedder Street, Central Hong Kong
22	Brainfield Ltd 201 Kam Hung Commercial Building, 80 Queen's Road East, Wan Chai Hong Kong
23	Bridgewater & Coulton Ltd Unit G, 13/F Kaiser Estate Phase 2, 251 Man Yue Street, Hunghom, Kowloon
24	Brisky Ltd Rm 1704, Tung Wah Mansion, 199-203 Hennessy Rd, Wanchai, HK
25	BYME Engineering (HK) Ltd 303-306A Island Place Tower, 510 King's Road, North Point Hong Kong
26	C.B.M. Engineering Ltd 1603 Coimark, 28 Yuen Shun Circuit, Siu Lek Yuen, Shatin NT
27	Carewin Engineering Ltd 608 Cheung Tat Centre, 18 Cheung Lee Street, Chai Wan Hong Kong
28	Carrier Construction Ltd 2204-B Nan Fung Centre, 264-298 Castle Peak Road, Tsuen Wan NT,
29	CH2M-IDC Hong Kong Ltd Suite 3201, Central Plaza, 18 Harbour Rd, Wanchai, HK
30	Chan Sum Construction Co 5/F European Asian Bank Building Room C, 749 Nathan Road, Kowloon
31	Charter Construction Co 8/F Argyle House, 49A Argyle Street, Kowloon
32	Chen Cheong Construction Co Ltd 705 Federal Building, 369 Lockhart Road,Wan Chai Hong Kong
33	Cheong Fat General Contractor Co Ltd 2101 Jubi Tower, 5 O'Brien Road, Wan Chai Hong Kong
34	Cheung Hing E & M Ltd 108 Fortune Building, 150-158 Lockhart Road, Wan Chai Hong Kong
35	Cheung Kee Fung Cheung Construction Co Ltd 12/F World Trade Square Tower II, 123 Hoi Bun Road, Kwun Tong Kowloon,
36	Chevalier (HK) Ltd 22/F Chevalier Commercial Centre, 8 Wang Hoi Road, Kowloon Bay Kowloon
37	China Fire Co 2406 Wing Hing Industrial Building, 83-93 Chai Wan Kok Street, Tsuen Wan NT
38	China Harbour Engineering Co (Group) 19/F China Harbour Building, 370-374 King's Road, North Point Hong Kong
39	China Overseas Holdings Ltd 29/F, China Overseas Building, 139 Hennessy Road, HK
40	China Overseas Mechanical & Electrical Engineering 27/F China Overseas Building,139 Hennessy Road, Wan Chai Hong Kong
41	China Resources Construction Co Ltd 1001-5 China Resources Building, 26 Harbour Road, Wan Chai Hong Kong
42	China State Construction Engrg. (Hong Kong) Ltd 29/F., China Overseas Bldg, 139 Hennessy Road, Wanchai, HK
43	Ching Hing Engineering Co 713 Nan Fung Industrial City, Block 1, 18 Tin Hau Road, Tuen Mun NT
44	Chinney Construction Co Ltd 9/F Hong Kong Spinners Industrial Building, Block A & B Phase VI, 481-483 Castle Peak Road, Kowloon
45	Chong Kee Construction Co Ltd 102 Ping Fai Industrial Building, 312-314 Un Chau Street, Kowloon
46	Chow Lee Engineering Co Ltd 408 Victoria Centre, 15 Watson Road, North Point Hong Kong
47	Chun Wo Construction & Engineering Co Ltd 5/F Hong Kong Spinners Industrial Building C2, 601-603 Tai Nan West Street, Cheung Sha Wan, Kowloon
48	Chun Yip Construction Co Ltd 10/F Central Building, 3 Pedder Street, Hong Kong
49	Chung Kwan F.S. Engineering Co Ltd 606 Bell House Block B, 525-543 Nathan Road, Yau Ma Tei Kowloon
50	Chung Shing Construction Co Ltd 1301 Peninsula Square, 18 Sung On Street, Hung Hom Kowloon
51	Chung Shun Boring Engineering Co Ltd 4/F Ngai Wong Commercial Building, 11-13 Mongkok Road, Kowloon
52	CLP Power Hong Kong Ltd 147 Argyle St.,KLN
53	Concorde Construction Co Ltd 1601 Tai Shing Commercial (Yaumati) Building, 500 Nathan Road, Kowloon
54	Crownity Engineering Ltd 1714 Veristrong Industrial Centre Block A, 34-36 Au Pui Wan Street, Fo Tan Shatin NT
55	Dah Chong Hong (Engineering) Ltd 8/F 20 Kai Cheung Road, Kowloon Bay, Kowloon
56	Danfoss Industries Ltd Rm 1807, 410-418 Des Voeux Road West, HK
57	Dao Kee Construction Co Ltd 504-6 Hua Qin International Building, 340 Queen's Road Central, Hong Kong
58	Dragages Hong Kong Ltd 27/F 625 King's Road, North Point, HK
59	DrilTech Ground Engineering Ltd Block A & B, 9/F, Hong Kong Spinners Industrial Bldg, Phase VI, 481-483 Castle Peak Road, Kowloon.
60	Dtz Debenham Tie Leung Project Services Limited 16/F, 1063 King's Road, Quarry Bay, Hong Kong
61	Easiplus Engineering Ltd 6/F Hang Seng Centre Unit A, 95-97 Tung Chau Street, Kowloon
62	Electro-Mechanical (Equipment) Ltd 20/F Professional Building, 19-23 Tung Lo Wan Road, Causeway Bay Hong Kong
63	Elex Elevator Ltd 17/F, Java Commercial Centre, 128 Java Rd, North Point, HK
64	Endeavour (HK) Ltd 507 Mega Trade Centre, 1 Mei Wan Street, Tsuen Wan NT
65	Enpack (HK) Ltd 6/F Astoria Building, 34 Ashley Road, Tsim Sha Tsui Kowloon
66	ETS – Testconsult Ltd. 8/F Block B Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Shatin, NT
67	Evanex Ltd 9/F Golden Dragon Industrial Building, Flat H, Block 4, 182-190 Tai Lin Pai Road, Kwai Chung NT
68	Far East Engineering Services Ltd 19A Chai Wan Industrial Centre Building, 20 Lee Chung Street, Chai Wan, Hong Kong
69	Fita (Int'l) Fire Prevention Engineering Ltd 17/F So Tao Centre Flat A & B, 11-15 Kwai Sau Road, Kwai Chung NT
70	Fook Lee Construction Co Ltd 30/F Fook Lee Commercial Centre, Town Place, 33 Lockhart Road, Wan Chai Hong Kong
71	Foundation Techniques Ltd 8/F., Cheun Hing Industrial Building, 14 Wang Tai Rd, Kowloon Bay, Kowloon
72	Frank & Vargeson (HK) Ltd 8/F Greatmany Centre, 109-115 Queen's Road East, Wan Chai Hong Kong
73	Fraser Construction Co Ltd 823 Pacific Link Tower (South Mark), 11 Yip Hing Street, Wong Chuk Hang Hong Kong
74	Free Form Construction Co Ltd 11/F Westlands Centre Unit 8, 20 Westlands Road, Quarry Bay Hong Kong
75	Freyssinet Hong Kong Ltd Rm 1201-3, COL Tower, World Trade Square, 124 Hoi Bun Rd, Kwun Tong, KLN
76	Fu Hing Construction Co Ltd 601 Tung Ming Building, 40-42 Des Voeux Road Central, Hong Kong
77	Fugro (Hong Kong) Ltd 22/F, Hopewell Centre, 183 Queen's Road East, Wanchai, HK
78	Fugro Geotechnical Services Ltd Units 6, 8-11, 10/F Worldwide Industrial Centre, 43-47 Shan Mei St, Fo Tan, Shatin, NT
79	Gale Engineering Co Ltd 8/F North Cape Commercial Building, 388 King's Road, Hong Kong
80	Gammon Construction Ltd 28/F Devon House, Taikoo Place 979 King's Road, Quarry Bay Hong Kong
81	Gammon Skanska Ltd 28/F, Devon House, TaiKoo Place, 979 King's Road, Quarry Bay, HK
82	GeoTech Engineering Ltd 2207 CCT Telecom Building, 11 Wo Shing Street, Fo Tan Shatin NT,
83	Goldfield Building Contractors Ltd 2/F Air Goal Cargo Building, 330 Kwun Tong Road, Kowloon
84	Goldford Engineering Ltd 210 Fanling Industrial Centre, 21 On Kui Street, Fanling NT
85	Good Castle Fire Engineering Ltd 1315 Hoi Luen Industrial Centre Block A, 55 Hoi Yuen Road, Kwun Tong Kowloon
86	Goodwell Electrical Contractor & Supplier Ltd 5/F Room 503, 88 Kwai Cheong Road, Kwai Chung NT
87	Grandtone Engineering Ltd 501 Cheung Tat Commercial Building, 60-66 Wing Lok Street, Hong Kong
88	Granville Contractors Ltd 23/F Skyline Tower, 18 Tong Mei Road, Mong Kok Kowloon
89	Guardian Fire Engineers & Consultants Ltd 1302 Tak King Industrial Building, 27 Lee Chung Street, Chai Wan Hong Kong
90	G-Wah Engineering Ltd 2103 Bright Way Tower, 33 Mongkok Road Kowloon
91	H.K. General Building Contractors Association Ltd 19/F, Portwealth Centre, 83 Queen's Road East, HK
92	Hager Electro Ltd Suite 318, Chinachem Golden Plaza,77 Mody Road, TST East,KLN
93	Hanison Construction Co Ltd Unit 1, 6/F, Block B, Shatin Ind Centre, 5-7 Yuen Shun Circuit, Shatin, NT
94	Hanki Contractors (HK) & Associates Ltd 16/F Universal Industrial Centre Room L, 19-25 Shan Mei Street, Fo Tan Shatin NT
95	Helen Chan Professional Land Survey Ltd 2/F, No. 34 Lung Sum Avenue, Sheung Shui, NT
96	Hebe Engineering Ltd 3301 Hong Kong Plaza, 186-191 Connaught Road West, Hong Kong
97	Hip Hing Construction Co Ltd 29/F New World Tower, 16-18 Queen's Road Central, Hong Kong
98	Hong Kong Construction (Holdings) Ltd Rm 801-2 East Ocean Centre, 98 Granville Rd, Tsimshatsui, KLN
99	Hong Kong Macau (Asia) Engineering Co Ltd 1/F Kerwent Mansion, 193-195 Tung Mi Road, Mong Kok Kowloon
100	Hong Kong Wastewater Treatment Plant Management Co Ltd 206 Fok Shing Commercial Building, 28 On Lok Mun Street, On Lok Tsuen Fanling NT
101	Hoo Cheong Building Construction Co Ltd 16/F Podium Plaza, 5 Hanoi Road, Tsim Sha Tsui Kowloon
102	Hop Shing Construction Co Ltd 23/F Loyong Court Commercial Building, Flat A, 212-220 Lockhart Road, Wan Chai Hong Kong
103	Hope Seng Construction Ltd 3/F Sun Hey Building Flat C, 72 Hennessy Road, Wan Chai Hong Kong
104	Hopewell Holdings Ltd 64/F Hopewell Centre, 183 Queen's Road East, Hong Kong
105	Housing Department, Development & Construction Division Housing Authority Headquarters, 33 Fat Kwong St., Ho Man Tin, KLN
106	Hsin Chong Aster Building Services Ltd 6/F Hsin Chong Centre, 107-109 Wai Yip Street, Kwun Tong Kowloon
107	Hsin Yieh Architects and Associates Ltd 13/F, China United Centre, 28 Marble Rd, North Point, HK
108	HUD General Engineering Services Ltd TYTL 108, Sai Tso Wan Road, Tsing Yi Island NT
109	Hutchison Whampoa Ltd 22/F Hutchison House,10 Harcourt Road, Central Hong Kong
110	In Construction Ltd 19A Park Avenue Tower, 5 Moreton Terrace, Causeway Bay Hong Kong
111	International Kam Fai Construction & Engineering Co Ltd 13/F Golden Hill Commercial Building 209-211 Hennessy Road Wan Chai Hong Kong
112	Intrafor S.A. 51/F Hopewell Centre 183 Queen's Road East Wan Chai Hong Kong
113	Ipson Renovation 1348 Hong Kong Int'l Trade & Exhibition Centre 1 Trademart Drive Kowloon Bay Kowloon
114	Jet Well Construction & Engineering Co G/F Dragon Industrial Building Flat C 93 King Lam Street Lai Chi Kok Kowloon
115	Johnson Controls Hong Kong Ltd 32/F Millennium City Tower 1, 388 Kwun Tong Road, Kwun Tong Kowloon
116	Kader Engineering Co Ltd 8/F Flat C, 97 Wellington Street, Central Hong Kong
117	Kam Hing Engineering Co Ltd 25/F Golden Dragon Industrial Building, Flat B Block 3, 172-180 Tai Lin Pai Road, Kwai Chung NT
118	Kei Kee Shui Wah Construction Co Ltd 26/F Shield Industrial Centre Flat F, 84-92 Chai Wan Kok Street, Tsuen Wan NT
119	Kelly Construction Co Ltd 2/F Kai Kwong Commercial Building, 332 Lockhart Road, Wan Chai Hong Kong
120	Kentech Construction Co Ltd 3/F Tin On Sing Commercial Building, 41-43 Graham Street, Central Hong Kong
121	Kervin Engineering Co Ltd 3104 Johnson Hang Sing Centre, 71-75 Container Port Road, Kwai Chung NT
122	Kata Engineering Ltd 1801-2 Workingfield Commercial Building, 408-412 Jaffe Road, Causeway Bay Hong Kong
123	Keung Kee Construction Ltd 2/F Man Cheung Building, 29 & 31 Ferry Point, Kowloon
124	Kin Fai Construction Co Ltd 602-3 Leader Commercial Building, 54-56 Hillwood Road, Tsim Sha Tsui Kowloon
125	Kin Hing Building Contractor Co Ground Floor 35-37 Third Street, Sai Ying Pun, Hong Kong
156	Kin Keung Construction & Engineering Co Ltd, 6/F Tung Kai Building Flat 1, 168 Jaffe Road, Wan Chai Hong Kong
127	Kin Ming Construction Co Ltd 6C Wang On Court, 310A King's Road, Hong Kong
128	Kin Ming E&M Works Ltd 1109 Lucida Industrial Building, 43-47 Wang Lung Street, Tsuen Wan NT
129	Kin Wing Engineering Co Ltd Block A & B, 9/F, Hong Kong Spinners Industrial Bldg., Phase VI, 481-483 Castle Peak Road, KLN
130	Knight Frank Hong Kong Ltd 29/F, Office Tower, Convention Plaza, No. 1 Harbour Road, Wanchai, Hong Kong
131	Konwall Construction & Engineering Co Ltd 1003 K. Wah Centre, 191 Java Road, North Point Hong Kong
132	Kowloon Development Co Ltd 23/F Pioneer Centre, 750 Nathan Road, Kowloon
133	Kowloon-Canton Railway Corporation West Rail Division 8/F Citylink Plaza, Sha Tin N.T.
134	K-Peak Co Ltd 3/F Hoi Fai Building Room 8, 129-135 Castle Peak Road, Kowloon
135	Krueger Engineering (Asia) Ltd 2501 Hopewell Centre, 183 Queen's Road East, Wan Chai Hong Kong

136	Kwan Cheong Construction Ltd Room 504, 582-588 Canton Road, Kowloon
137	Kwan Lee Hydro-Electric Engineering Ltd No. 23 G/F Lin Fat Building, 2 Fung Kwan Street, Yuen Long NT
138	Kwan On Construction Co Ltd 3-E Yiko Industrial Building, 10 Ka Yip Street Chai Wan Hong Kong
140	Kwong Key Construction & Engineering Ltd 2602-05 Wealth Commercial Centre, 42 Kwong Wa Street, Mong Kok Kowloon
141	Lam Construction Co Ltd 2304-6 World Trade Centre, 280 Gloucester Road, Causeway Bay Hong Kong
142	Lap Kai Engineering Co Ltd 1/F Kowloon Bay Industrial Centre, Unit 25 15 Wang Hoi Road, Kowloon Bay Kowloon
143	Law Chi Yip Construction Co Ltd 1503 President Commercial Centre, 608 Nathan Road, Kowloon
144	LCL Contracting Ltd 21/F Wyndham Place, 40-44 Wyndham Street, Central Hong Kong
145	Lee Yu Kee Fire Protection Ltd 613 Yau Tong Industrial City Block A2, 17 Ko Fai Road, Yau Tong Kowloon
146	Leighton Contractors (Asia) Ltd 39/F Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong
147	Lick Hang Engineering Co Ltd 2806 New Treasure Centre, 10 Ng Fong Street, San Po Kong Kowloon
148	Lidell Construction Co Ltd 2701 CITIC Centre, 28 Queen's Road East, Wan Chai Hong Kong
149	Lik Kai Engineering Co Ltd 31/F Grand City Plaza, 1 Sai Lau Kok Road, Tsuen Wan NT
150	Lin Fat Construction & Engineering Co Ltd 7/F, 66 Cheungshawan Road, Kowloon
151	Lok's Engineering Ltd 23/F Evernew Commercial Centre Flat A, 33 Pine Street, Tai Kok Tsui Kowloon
152	Long Nice Co Ltd Ground Floor, 21 Cooke Street, Hung Hom Kowloon
153	Ma Shing Yip Piling & Construction Ltd 4 Dorset Crescent, Kowloon Tong, Kowloon
154	Maidstone Construction Co Ltd 20/F The Hong Kong Club Building, 3A Chater Road, Central Hong Kong
155	Management and Planning Services (FE) Ltd 20/F Professional Building, 19-23 Tung Lo Wan Road, Causeway Bay Hong Kong
156	Martin Construction Co Ltd 16/F Centre 600 Units D-F, 82 King Lam Street, Lai Chi Kok Kowloon
157	MDA Hong Kong Ltd 22/F, 133 Wanchai Road, Wanchai, Hong Kong
158	Meco Engineering Ltd 3-4/F, Vulcan House, 21-23 Leighton Road,Causeway Bay, HK
159	Meinhardt (Hong Kong) Ltd 4/F Wah Ming Centre, 421 Queen's Road West, Hong Kong
160	Million Bright Construction & Engineering Co Ltd 17/F CNT Tower Flat F, 338 Hennessy Road, Wan Chai Hong Kong
161	Ming Chun Construction Co Ltd 1210 Hang Ngai Jewelry Centre, 4 Hok Yuen Street East, Hung Hom Kowloon
162	Multi-Premium Engineering Ltd Ground Floor Lee Wan Building, 5 Luk Hop Street, San Po Kong Kowloon
163	Mutual Construction & Engineering Co 906-7 Workingfield Commercial Building, 408-412 Jaffe Road, Causeway Bay Hong Kong
164	Nam Kwong Electric Co Ltd 1C/D Young Ya Industrial Building, 381-389 Sha Tsui Road, Tsuen Wan NT
165	National Concord Engineering Ltd Unit 2H, 5/F, Cheung Fung Industrial Bldg, 23-39 Pak Tin Par Street, Tsuen Wan, NT
166	Newland Engineering Ltd A2, 4/F, Phase II, Hang Fung Ind. Bldg., 2G Hok Yuen Street, Hunghom, KLN
167	Newton Engineering Co Ltd Ground Floor, 28-32 Fort Street, North Point Hong Kong
168	Nga Luen Decoration Design Engineering Co 20/F Gold King Industrial Building Flat B, 35-41 Tai Lin Pai Road, Kwai Chung NT
169	Nin Hing Electronic Engineering Ltd 18/F, New Victory House, 93 Wing Lok Street, Central, HK
170	Nishimatsu Construction Co Ltd 508 Star House, 3 Salisbury Road, Tsim Sha Tsui Kowloon
171	Northcroft Hong Kong Ltd 11/F, Great Smart Tower, 230 Wanchai Road, Wanchai, Hong Kong

172	On Hing Engineering Co 3/F Yee Kuk Industrial Centre Room 5, 555 Yee Kuk Street, Cheung Sha Wan Kowloon
173	Oxyvital Ltd 15B Wyndham Place, 44 Wyndham Street, Central Hong Kong
174	P.D. (Contractors) Ltd 12/F New Kowloon Plaza, 38 Tai Kok Tsui Road, Kowloon
175	Parsons Brinckerhoff (Asia) Ltd 23/F, AIA Tower, 183 Electric Road, North Point, HK
176	Pat Davie (China) Ltd 12/F New Kowloon Plaza, 38 Tai Kok Tsui Road, Kowloon
177	Paul Y. - ITC Construction Group Ltd 16/F, Paul Y. Centre, 51 Hung To Road, Kwun Tong, KLN
178	Penta-Ocean Construction Co Ltd Unit 601, K. Wah Centre,191 Java Road,North Point, Hong Kong
179	Perfect Fire Protection Co 9/F Fuk Cheung Factory Building, Flat A 1 Walnut Street, Kowloon
180	Po Sing Air-Conditioning & Engineering Co Ltd 1/F Cheung Wei Industrial Building, 42 Lee Chung Street, Chai Wan Hong Kong
181	Po Tak Construction Co Ltd 3/F Flat A, 376-378 Prince Edward Road, Kowloon
182	Professional Engineering Ltd Room 1501, Chinachem Leighton Plaza, 29 Leighton Road, Causeway Bay, HK
183	PWL Surveyors Limited Room B, 17th Floor, Cheuk Nang 21st Century Plaza, 250 Hennessy Road, Wanchai, Hong Kong
184	Rankine & Hill (HK) Ltd 2001 Sing Pao Building, 101 King's Road, North Point Hong Kong
185	Rankine Engineering Co Ltd 9/F Shiu Fung Building, 51-53 Johnston Road, Wan Chai Hong Kong
186	Ray On Construction Co Ltd 2009 Fortress Tower, 250 King's Road, Hong Kong
187	Reliable (HK) Co 6/F Mai Hong Industrial Building Room A7-A8, 160 Wai Yip Street, Kwun Tong Kowloon
188	Rubicon Engineering Co Ltd 8/F Spectrum Tower Unit B, 53 Hung To Road, Kwun Tong Kowloon
189	Ryoden Engineering Co Ltd 11/F Manulife Tower, 169 Electric Road, North Point Hong Kong
190	Sam Cheong Construction Co Ltd Mezzanine Floor, 21 Tai Pa Street, Tsuen Wan NT
191	Sam Cheong Construction Co Ltd Mezzanine Floor, 21 Tai Pa Street, Tsuen Wan NT
192	Sang Hing Civil Contractors Co Ltd 213A-B Central Services Building, Nan Fung Industrial City, 18 Tin Hau Road, Tuen Mun NT
193	Schneider Electric (HK) Ltd Rms3108-3128, 31/F, Sun Hung Kai Centre,30 Harbour Road,Wanchai, HK
194	Schneider Electric (HK) Ltd Rms3108-3128, 31/F, Sun Hung Kai Centre,30 Harbour Road,Wanchai, HK
195	Senton Engineering Ltd Ground Floor, 46 Haven Street, Causeway Bay Hong Kong
196	Shimizu HK Co Ltd 1905-1909 Ever Gain Plaza Tower One, 88 Container Port Road, Kwai Chung NT
197	Shimizu HK Co Ltd 1905-1909 Ever Gain Plaza Tower One, 88 Container Port Road, Kwai Chung NT
198	Shui On Construction and Materials Ltd 34/F, Shui On Centre, 6-8 Harbour Road, Wanchai, HK
199	Shui On Construction Co. Ltd 12/F, New Kowloon Plaza, 38 Tai Kok Tsui Rd, KLN
200	Shui Wing Engineering Co Ltd 12/F Wofoo Commercial Building, 576 Nathan Road , Mong Kok Kowloon
201	Shun Hing Engineering Contracting Co., Ltd 16/F., Shun Hing Centre, 8 Shing Yiu Street, Kai Chung, NT
202	Shun Lee (China) Development Co Ltd 7/F M P Industrial Centre, Unit 9 Block B, 18 Ka Yip Street, Chai Wan Hong Kong
203	Shun Yuen Construction Co Ltd 12/F China Trade Centre, 122-124 Wai Yip Street, Kwun Tong Kowloon
204	Sing Kee Co Ltd Room 3102, Nine Queen's Road Central,Hong Kong
205	Skanska International Civil Engineering AB 28/F Devon House, Taikoo Place, 979 King's Road Hong Kong

206	Skyforce Engineering Ltd 16/F Eastern Commercial Centre, 83 Nam On Street, Shau Kei Wan Hong Kong
207	Solone Construction Co Ltd 2500 Dominion Centre, 43-59 Queen's Road East, Wan Chai Hong Kong
208	Soundwill HK Ltd 21/F Soundwill Plaza, 38 Russell Street, Causeway Bay Hong Kong
209	Splendid Engineering Co 11/F Kwun Tong Industrial Centre, Flat D Phase I, Kwun Tong Road Kowloon
210	Springfield Engineering Co Ltd 1505 Workingview Commercial Building, 21 Yiu Wa Street, Causeway Bay Hong Kong
211	SRD Computing & Engineering Co., Ltd B7-B8, 6/F, Po Yip Bldg. 62-70 Texaco Rd, Tsuen Wan, NT
212	Stress (FE) Ltd 1609 Silvercord Tower 1, 30 Canton Road, Tsim Sha Tsui Kowloon
213	Sun Fook Kong Holdings Limited Rm 1207-10, Great Eagle Centre, 23 Harbour Road, Wanchai, HK
214	Sun Spark Construction Ltd 2/F Max Trade Centre, 23 Luk Hop Street, San Po Kong Kowloon
215	Sunley Engineering & Construction Co Ltd 201 Marina House, 68 Hing Man Street, Shau Kei Wan Hong Kong
216	Surpass Company Ltd Office 1105, 69 Jervois Street, Sheung Wan, Hong Kong
217	Tai Lee (Hong Kong) Construction Co Ltd 1102 Hollywood Plaza, 610 Nathan Road, Mongkok Kowloon
218	Tai Yieh Construction & Engineering Co Ltd 29/F New World Tower, 16-18 Queen's Road Central, Hong Kong
219	Tak Choong Construction Co Ltd 402 Wellington Plaza, 56-58 Wellington Street, Hong Kong
220	Tak Hing Construction Co Ltd 1108-1100 K. Wah Centre, 191 Java Road, North Point Hong Kong
221	Talent Mechanical & Electrical Engineers Unit 203, 2/F, Dominion Centre,43-59 Queen's Road West,Wanchai, Hong Kong
222	Tam Fok Engineering Co 8/F Kakok Building, 720C Nathan Road, Mong Kok Kowloon
223	Tapbo Civil Engineering Co (a/b Great Bill Ltd) 1202 Yee Kuk Industrial Centre, 555 Yee Kuk Street, Cheung Sha Wan Kowloon
224	Techoy Construction Co Ltd 2/F Centre 600, 82 King Lam Street, Lai Chi Kok Kowloon
225	The Hong Kong and China Gas Co Ltd 363 Java Road, North Point, HK
226	The Hongkong Electric Co Ltd Hongkong Electric Centre,44 Kennedy Road,HK
227	The Sun Co Ltd 20/F Sun House, 90 Connaught Road Central, Hong Kong
228	Fivestars contractors Tower, 32D Aguilar St, Central, HK,
229	Trans Service Hong Kong 15/F, Dragon Centre, 79 Wing Hong Street, Cheung Sha Wan,KLN
230	Trident Engineering Co Ltd Rm 602 Eastern Harbour Centre, 28 Hoi Chak Street, Quarry Bay, HK
231	Tung Lick Fire Engineering Co 904 Sin Wai Industrial Centre, 29-33 Wing Hong Street, Lai Chi Kok Kowloon
232	Tysan Foundation Limited 6/F, Sun Hung Kai Centre, 30 Harbour Rd, Wanchai, HK
233	Union Contractors Ltd 2/F Liven House Unit 8, 61-63 King Yip Street, Kwun Tong Kowloon
234	United Communications Electrical Engineering Co Ltd 1801 Wanchai Commercial Centre, 194-204 Johnston Road, Wan Chai Hong Kong
235	United Construction & Engineering Co 2/F Tak Woo Building Room 34-35, 12-16 Pak Kung Street, Hung Hom Kowloon
236	Univic Engineering Ltd 3D Yiko Industrial Building, 10 Ka Yip Street, Chai Wan Hong Kong,
237	Vibro (HK) Ltd 29/F New World Tower, 16-18 Queen's Road, Central Hong Kong
238	Viewing Services Co Ltd 1/F Startex Industrial Building Block C, 14 Tai Yau Street, San Po Kong Kowloon
239	Vigers Building Consultancy Limited 10/F The Grande Building, 398 Kwun Tong Road, Kowloon, Hong Kong
240	Vikings & Ellison Ltd Room 1221, Leighton Centre, 77 Leighton Road, Causeway Bay, HK
241	Wai Lun Engineering Co Ltd 1805 Corn Yan Centre, 3 Jupiter Street, North Point Hong Kong

242	Waking Builders Ltd 29/F New World Tower, 16-18 Queen's Road Central, Hong Kong
243	WALTECH Pacific (Engineering) Ltd 26/F Great Smart Tower, 230 Wanchai Road, Wan Chai Hong Kong
244	Wan Chung Construction Co Ltd 2/F Fuk On Building Flat A, 1123 Canton Road, Kowloon
245	Wan Kai Geotechnical Engineering Co Ltd 4/F Ngai Wong Commercial Building, 11-13 Mongkok Road, Kowloon
246	Wang Yip Construction Co Ltd 20/F The Hong Kong Club Building, 3A Chater Road, Central Hong Kong
247	Wasson Construction Co Ltd 12/F China Trade Centre, 122-124 Wai Yip Street, Kwun Tong Kowloon
248	WCWP International Ltd 11/F., Skyway House, 3 Sham Mong Rd, Tai Kok Tsui, KLN
249	Wonden Engineering Service Co Ltd 1402-3 Causeway Bay Centre, 15-23 Sugar Street, Causeway Bay Hong Kong
250	Wing Cheong Electrical Engineering & Contracting Co Ltd 11-13/F United Chinese Bank Building, 18 Tai Po Road, Kowloon
251	Wing Hong Contractors Ltd 7/F Eastern Commercial Centre, 395-399 Hennessy Road, Wan Chai Hong Kong
252	Wing Sang Construction Co Ltd 702 Hung Kai Mansion, 5-8 Queen Victoria Street, Central Hong Kong,
253	Wing Tai Pioneer Co Ltd 19/F President Commercial Centre, 602-608 Nathan Road, Kowloon
254	Wing's Construction Co Ltd 2001 New Trade Plaza Tower A, 6 On Ping Street, Shatin NT
255	Wong & Cheng Consulting Engineers Ltd 13/F Bank Centre, 636 Nathan Road, KLN,
256	WSP Hong Kong Limited 1/F, K. Wah Centre, 191 Java Road, North Point,
257	WTP (Hong Kong) Ltd 20/F, 625 King's Road, North Point, HK
258	Wu Yi Construction Co Ltd 25/F Island Beverley, 1-5 Great George Street, Causeway Bay Hong Kong
259	Y.K. Construction Co Ltd 9/F Man Hing Commercial Building, 79-83 Queen's Road Central, Hong Kong
260	Yan Cheong Construction Engineering Ltd 12/F Comet Commercial Building Unit C, 42A Wing Hong Street, Cheung Sha Wan Kowloon
261	Yau Lee Holdings Ltd 10/F, Tower 1, Enterprise Square, 9 Sheung Yuet Rd, Kowloon Bay, KLN
262	Yiu Lam Engineering Service Co Ltd 11/F Hung Tai Industrial Building Flat 6, 43 Hung To Road, Kwun Tong Kowloon
263	Young's Engineering Co. Ltd Rm 701-4 Eastern Harbour Centre, 28 Hoi Chak Street, Quarry Bay, HK
264	Yu Hsin Construction Co Ltd 2205 Arion Commercial Centre, 2-12 Queen's Road West, Hong Kong
265	Zhen Hua Engineering Co Ltd 19/F China Harbour Building, 370-374 King's Road, North Point Hong Kong

APPENDIX I

Data of the survey on criteria to assess the performance of subcontractors

Data for questionnaire survey on performance evaluation criteria

		q.3																					
Reply no.	q.2	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v
1	2	1.0	1.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	3.0	2.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0
2	7	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0
3	2	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	1.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0
4	5	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0	4.0	4.0	2.0	2.0	3.0	3.0	3.0
5	1	1.5	3.0	1.0	1.0	3.0	3.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	4.0	3.0
6	12	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	1.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0
7	22	1.5	2.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	4.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0
8	15	2.0	3.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	1.0	2.0	2.0	4.0	3.0	4.0	4.0	4.0	4.0	3.0	5.0	3.0	3.0
9	3	2.0	2.0	3.0	3.0	2.0	2.0	2.0	1.5	2.0	2.0	3.0	3.0	3.0	1.0	4.0	4.0	4.0	3.0	2.0	2.0	4.0	4.0
10	5	1.0	1.0	2.0	2.0	1.0	1.0	3.0	3.0	2.0	2.0	2.0	3.0	4.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	3.0	3.0
11	4	1.0	2.0	2.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	4.0	4.0	3.0	2.0	2.5	2.5	4.0
12	20	1.0	1.0	2.0	2.0	2.0	1.0	2.0	1.0	2.5	2.0	3.0	2.0	3.0	4.0	2.0	3.0	3.0	3.0	3.0	2.0	4.0	3.0
13	16	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0
14	4	1.0	2.0	2.0	2.0	2.5	2.5	2.0	1.0	2.5	3.0	3.0	1.0	2.0	1.0	3.0	2.0	3.0	2.0	3.0	3.0	4.0	4.5
15	18	2.0	2.0	1.0	3.0	2.0	1.0	2.0	2.0	2.5	1.0	1.0	3.0	2.0	2.0	2.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
16	25	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.0	3.0	2.0	2.0	2.5	2.0
17	8	1.0	1.0	2.0	2.0	2.0	1.0	3.0	1.5	2.0	1.0	3.0	3.0	2.0	2.0	4.0	4.0	2.0	3.0	4.0	4.0	4.0	4.0
18	3	2.0	2.0	3.0	3.0	2.0	2.0	2.0	3.0	2.5	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	4.0	4.0	3.0
19	2	2.0	1.0	1.0	1.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	3.0
20	6	1.0	2.0	1.5	1.0	2.0	2.5	2.0	2.0	3.0	1.0	1.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	4.0	4.0	3.0	4.0
21	10	1.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0	1.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0
22	9	1.0	1.0	2.5	1.0	2.0	2.0	1.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	3.0	4.0	4.0	4.0	3.0	3.0	4.0	4.5
23	18	1.0	1.0	1.0	1.5	2.0	2.0	1.0	1.0	2.0	1.5	2.0	2.0	2.0	2.0	3.0	2.5	3.0	1.5	2.5	2.0	3.0	4.0
24	15	1.0	1.5	2.0	2.0	2.0	2.0	1.0	2.5	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	4.5
25	3	2.0	2.0	1.0	2.0	2.5	2.5	2.0	1.0	2.5	1.0	2.0	3.0	3.0	1.5	2.5	3.0	3.0	2.0	3.0	2.0	2.0	4.0
26	5	1.0	2.0	2.0	3.0	1.0	2.0	1.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0
27	1	2.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	4.0	5.0

APPENDIX J

Data of the survey on identifying the important influencing factors for subcontracts

Summary of data of the in-depth interviews

a. Score by construction manager

	CM1	CM2	CM3
Factor	**Score**	**Score**	**Score**
Perceived profitability of the subcontracts	7.0	9.0	8.0
Payment to the subcontractors	7.0	9.0	7.0
Approval process	7.5	8.0	7.0
Level of coordination	6.0	8.0	8.0
Relationship among the participants	5.0	9.0	8.0
Understanding on the subcontract works	6.0	8.0	8.0
Design changes	7.0	7.5	7.0
Unrealistic subcontract duration	8.0	7.0	6.5
Response by the design team	9.0	6.5	5.5
Staff support of the subcontractors	7.0	5.0	9.0
Claims for extra works	7.0	8.5	5.0
Schedule change	8.0	7.5	5.0
Buildability of the design	8.0	7.0	5.0
Incentive scheme	6.0	8.0	6.0
Managerial ability	6.0	5.5	8.5
Acceptance of new ideas	9.0	5.0	5.0
Plant support by main contractor	8.0	6.0	5.0
Formal feedback channel	3.0	8.0	7.5
Material support by the main contractor	4.0	8.0	6.5
Treated fairly	7.5	5.0	6.0
Complexity of work	8.0	4.0	6.0
Risk sharing between main contactor & subcontractors	6.0	7.0	5.0
Use of new technology	8.0	6.0	3.0
Payment methods	7.0	4.0	5.0
Involvement in the design	4.0	7.5	4.0
Restrictions due to environmental factors	5.0	4.0	6.5
Technical ability	5.0	5.0	5.0
Quality of design document	6.0	5.0	3.0
Financial ability	3.0	7.0	2.0

b. Score by foreman of main contractors

	FM1	FM2	FM3
Factor	**Score**	**Score**	**Score**
Perceived profitability of the subcontracts	8.0	9.0	9.0
Payment to the subcontractors	8.5	9.0	7.0
Buildability of the design	8.0	8.0	8.0
Level of coordination	7.0	8.0	8.5
Approval process	9.0	5.0	9.0
Claims for extra works	8.0	9.0	6.0
Staff support of the subcontractors	6.0	9.0	8.0
Acceptance of new ideas	8.0	8.5	6.0
Formal feedback channel	5.0	9.0	8.5
Incentive scheme	7.5	9.0	6.0
Schedule change	8.0	9.0	5.0
Design change	5.5	7.0	9.0
Treated fairly	7.0	7.5	7.0
Relationship among the participants	8.0	6.5	6.0
Response by the design team	7.0	6.0	7.0
Unrealistic subcontract duration	6.0	8.0	6.0
Involvement in the design	7.0	5.0	7.0
Understanding on the subcontract works	6.0	5.0	8.0
Managerial ability	3.0	7.0	8.0
Material support by the main contractor	5.0	7.0	6.0
Plant support by main contractor	8.0	6.0	4.0
Restrictions due to environmental factors	4.0	5.5	8.5
Risk sharing between main contractor & subcontractors	8.0	5.0	5.0
Technical ability	8.0	4.0	6.0
Complexity of work	6.0	6.0	5.0
Use of new technology	5.0	6.0	6.0
Financial ability	4.0	5.0	7.0
Quality of design document	3.0	4.0	8.0
Payment methods	6.0	3.0	5.0

c. **Score by subcontractors**

	SC1	SC2	SC3
Factor	**Score**	**Score**	**Score**
Payment to the subcontractors	8.0	9.0	9.0
Perceived profitability of the subcontracts	6.0	8.5	9.0
Level of coordination	7.0	8.0	8.0
Claims for extra works	8.0	7.5	7.0
Relationship among the participants	8.0	9.0	5.0
Treated fairly	8.0	7.5	6.5
Design change	6.5	6.0	9.0
Incentive scheme	6.0	7.0	8.5
Plant support by the main contractor	5.5	9.0	7.0
Schedule change	5.0	9.0	7.5
Risk sharing between main contractor & subcontractors	7.0	8.0	6.0
Involvement in the design	7.0	5.0	8.5
Response by the design team	7.0	5.5	8.0
Formal feedback channel	6.0	8.0	6.0
Approval process	6.5	7.5	5.5
Staff support by the main contractor	3.0	8.5	8.0
Buildability of the design	6.0	7.0	6.0
Unrealistic subcontract duration	8.0	6.0	5.0
Restrictions due to environmental factors	7.0	4.0	7.5
Understanding on the subcontract works	5.0	8.5	5.0
Managerial ability	4.0	8.0	6.0
Material support by the main contractor	5.0	6.0	7.0
Financial ability	6.0	6.5	5.0
Technical ability	5.5	4.0	8.0
Use of new technology	6.0	6.0	5.0
Complexity of work	4.0	6.0	6.0
Quality of design document	7.0	3.0	5.5
Acceptance of new ideas	5.0	2.0	5.0
Payment methods	5.0	2.0	5.0

APPENDIX K

Data of the survey on identifying critical site coordination problems

Data for survey on critical site coordination problems

Question 4

Case	a	a	b	b	c	c	d	d	e	e	f	f	g	g	h	h	i	i
	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP
1	8.0	5.0	8.0	7.0	5.0	4.0	3.0	6.0	4.0	5.0	3.0	6.0	3.0	2.0	3.0	5.0	3.0	6.0
2	7.0	5.0	8.0	7.5	4.0	3.0	3.0	6.0	5.0	5.0	3.0	8.0	4.0	2.0	3.0	6.0	3.0	5.5
3	8.5	6.0	8.0	6.0	5.0	3.0	3.5	6.5	6.0	6.0	4.0	7.0	6.5	3.0	3.5	7.0	2.0	5.0
4	7.0	6.0	7.5	7.5	6.0	3.5	4.0	7.0	5.5	7.0	4.5	6.0	6.5	3.5	2.5	8.0	3.5	4.5
5	7.5	5.5	7.0	6.0	6.5	4.0	4.0	6.5	7.0	4.5	3.0	6.5	5.0	3.0	4.0	8.0	4.0	5.5
6	7.5	6.0	8.0	6.0	6.0	4.5	4.5	4.0	6.0	7.0	3.5	6.0	6.0	3.0	3.0	8.5	6.0	8.5
7	6.0	4.5	7.0	6.0	3.5	4.0	4.0	4.0	5.5	5.0	4.0	7.0	4.0	2.5	2.0	7.0	5.0	4.0
8	6.0	5.0	7.5	7.5	4.0	5.0	5.0	5.0	4.0	6.0	4.5	5.0	7.5	4.0	2.0	7.5	3.0	5.5
9	8.5	6.5	7.0	5.5	5.0	6.0	3.0	4.5	3.0	7.5	3.0	6.0	4.0	5.0	3.5	8.0	3.0	7.0
10	7.0	5.0	8.0	5.0	5.5	6.5	2.0	4.0	3.5	8.0	3.0	4.5	4.0	6.0	3.0	8.0	3.5	7.0
11	7.0	5.5	7.5	4.5	4.0	4.0	2.5	5.0	4.0	6.0	3.0	4.0	5.0	4.0	3.5	7.5	2.0	7.5
12	5.5	6.0	5.5	6.0	4.0	3.5	4.0	5.5	3.0	6.0	4.0	5.0	6.0	3.0	3.0	7.0	3.0	7.0
13	6.0	7.0	6.0	5.5	4.5	4.5	5.0	7.5	4.5	7.5	4.0	7.0	4.0	3.5	3.5	7.0	3.0	8.0
14	6.0	7.5	6.5	5.0	3.0	5.0	4.5	8.0	4.0	6.5	3.0	6.0	6.0	4.0	3.0	8.0	2.0	4.5
15	6.5	6.0	5.0	6.0	3.5	5.0	5.0	6.0	6.0	5.0	3.5	5.5	5.0	2.0	3.5	6.0	3.5	5.0
16	6.5	6.0	7.0	5.0	4.0	6.0	5.5	7.5	6.0	6.0	4.0	5.5	3.0	2.0	4.0	5.5	4.0	4.5
17	8.5	6.5	7.0	6.5	5.0	4.5	5.0	7.0	6.5	6.5	5.0	8.5	3.0	2.5	3.0	6.0	3.0	5.5
18	7.0	5.0	7.0	7.0	5.5	3.0	4.0	7.0	4.0	7.0	5.5	6.0	3.0	3.0	3.0	7.5	4.0	4.0
19	7.0	5.0	7.5	7.5	5.0	3.5	3.0	6.0	3.0	6.5	3.0	5.0	2.0	2.5	4.0	6.0	4.5	5.5
20	8.5	4.0	7.0	8.0	4.0	5.0	4.5	7.5	4.0	7.0	3.0	8.0	5.0	2.0	2.0	6.0	5.0	7.0
21	7.5	5.0	7.5	7.0	5.0	3.0	4.0	7.0	5.0	4.5	4.0	6.5	6.0	3.0	2.0	8.0	3.5	6.0
22	7.0	4.5	8.5	7.5	5.5	3.5	3.0	6.0	5.0	5.5	3.5	7.0	5.5	2.0	2.0	7.0	4.5	6.0
23	8.5	6.0	5.0	6.0	6.5	4.0	2.5	5.5	4.5	6.0	3.5	7.5	7.0	2.5	3.0	8.5	5.0	6.5
24	6.5	7.5	7.0	7.0	4.0	5.5	4.0	4.0	5.0	8.0	4.5	6.0	7.0	4.5	2.0	7.5	3.0	5.0
25	7.5	5.0	6.5	6.5	5.5	5.0	4.0	7.0	3.0	7.0	4.5	5.0	5.5	4.0	3.0	5.5	2.0	4.5
26	7.5	5.0	7.0	6.0	4.5	5.5	4.5	6.0	3.5	7.5	4.0	5.5	3.0	2.5	4.0	6.5	2.5	5.0
27	6.0	6.5	8.0	6.5	5.0	6.0	4.0	4.5	4.0	7.0	3.5	4.0	4.0	2.0	4.5	7.5	3.0	5.5
29	7.5	5.0	8.0	4.0	4.5	5.0	5.0	7.5	4.5	6.5	2.5	3.0	3.5	2.5	5.0	5.5	3.5	5.0
30	6.5	7.0	8.5	5.5	5.0	3.5	3.5	5.0	4.5	5.0	4.5	8.0	4.0	3.0	4.5	7.5	6.0	7.5
31	6.5	6.5	6.5	5.5	3.0	2.5	5.0	5.5	5.0	5.5	5.0	7.5	2.5	3.5	4.0	8.0	3.0	7.0
32	7.5	5.0	5.0	6.0	3.5	3.0	3.0	6.0	5.0	6.5	3.5	8.0	4.0	3.5	3.0	5.5	2.5	4.5
33	8.5	5.0	7.0	6.5	4.5	5.0	4.0	6.5	7.0	5.0	3.0	6.5	5.0	3.0	2.5	7.0	4.0	7.0
34	5.5	5.5	7.0	6.0	4.5	4.5	4.5	7.5	6.0	6.5	3.5	5.0	4.5	4.0	2.0	7.0	3.0	6.0
35	6.5	5.5	8.0	7.5	4.0	5.5	4.5	6.5	4.5	7.0	2.0	6.5	3.5	4.0	2.0	7.0	3.5	6.5

Case	j	j	k	k	l	l	m	m	n	n	o	o	p	p	q	q	r	r	s	s
	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP	F	IP
1	6.0	5.0	6.0	7.0	6.0	4.0	3.0	4.0	4.0	5.0	3.0	5.0	3.0	6.0	2.0	6.0	4.0	3.0	3.0	4.0
2	6.0	7.5	5.5	7.0	5.5	4.0	3.0	3.0	5.0	6.0	3.0	5.0	3.0	8.5	2.0	5.0	5.0	5.0	3.0	4.0
3	5.0	6.0	7.0	8.0	5.5	3.0	4.0	3.0	4.0	7.0	2.0	5.0	2.0	6.5	3.0	5.5	6.0	4.0	2.0	4.5
4	5.0	5.5	6.5	8.5	6.0	3.5	4.0	2.0	4.5	8.0	2.0	6.0	2.0	8.0	3.5	5.0	5.0	4.5	3.5	5.5
5	7.0	4.5	7.0	7.0	5.0	3.0	4.5	2.5	4.0	7.5	2.5	4.5	2.5	6.5	2.0	4.5	7.5	5.0	4.5	4.0
6	4.0	6.0	5.0	7.5	6.5	4.0	4.0	3.0	5.0	6.0	3.0	4.5	2.0	6.0	2.0	5.0	7.0	5.0	3.5	4.5
7	5.0	6.0	4.0	6.5	3.0	2.0	3.0	3.5	6.0	7.0	4.0	6.0	2.0	7.5	2.5	5.5	8.0	6.0	3.0	6.0
8	6.0	7.0	4.0	5.5	4.0	2.5	3.5	2.0	6.5	5.5	4.5	5.5	4.5	7.0	3.0	4.0	5.5	2.0	3.0	7.0
9	5.0	6.0	7.0	5.0	4.0	3.5	3.0	3.0	3.0	6.0	4.0	5.0	3.0	5.5	5.0	6.5	7.0	3.5	2.5	7.5
10	5.5	4.0	7.0	6.0	3.0	3.0	3.0	2.0	6.0	7.0	3.0	5.0	2.5	5.0	3.5	7.0	6.5	3.0	3.5	5.0
11	5.0	3.0	5.5	6.0	3.0	3.0	3.5	2.5	5.0	6.5	3.0	6.0	3.5	6.0	2.0	7.0	4.0	4.5	3.5	4.0
12	6.5	4.5	6.0	7.0	4.5	3.5	4.0	4.0	4.5	7.0	4.5	3.0	3.0	6.0	5.0	7.0	4.0	4.0	2.0	7.5
13	5.5	6.0	5.0	8.0	6.0	3.0	4.0	3.0	5.5	6.0	5.0	4.0	4.0	7.5	3.5	7.5	3.5	4.5	4.0	8.0
14	5.0	7.0	3.5	7.5	5.5	3.5	4.5	5.0	6.0	4.0	6.0	4.5	5.0	5.0	3.0	6.0	2.5	3.0	5.0	4.5
15	5.5	7.5	6.0	6.0	5.0	5.0	5.0	6.0	5.5	5.5	5.0	4.0	3.5	5.5	2.5	8.0	3.0	2.5	6.0	5.0
16	4.5	7.0	6.0	6.5	6.0	6.0	6.0	2.5	6.5	6.0	4.5	3.0	3.0	6.0	3.0	7.5	3.5	3.0	4.0	5.0
17	6.0	7.0	5.0	6.0	3.5	3.5	5.5	2.0	7.0	8.0	4.0	4.5	2.5	5.5	2.0	6.0	4.0	4.0	3.0	6.5
18	7.5	6.0	5.5	7.5	3.0	4.0	5.0	3.0	6.5	8.5	2.5	4.0	3.0	6.0	4.0	5.0	4.5	3.5	2.0	7.0
19	5.0	7.5	5.0	6.0	4.0	6.0	3.0	3.0	4.0	6.0	4.0	4.0	3.0	6.5	4.5	4.5	5.5	3.0	3.0	7.0
20	6.0	8.0	7.5	7.0	3.0	5.5	3.0	2.0	3.5	5.0	3.0	3.0	2.5	7.5	3.0	5.0	4.5	2.5	4.0	8.0
21	4.5	7.0	7.0	7.0	5.0	4.0	5.0	2.5	5.5	7.0	4.0	5.0	3.0	7.0	4.0	5.5	5.0	4.0	4.5	6.0
22	5.0	7.5	6.5	5.5	3.0	3.0	4.0	3.0	5.0	6.0	2.0	5.0	3.0	7.0	3.0	6.0	5.5	5.0	5.0	6.0
23	7.0	6.0	5.0	8.0	5.5	4.0	4.0	2.0	5.0	6.5	3.0	6.0	2.0	6.5	2.5	7.0	5.0	3.5	3.0	5.0
24	4.0	5.0	5.0	7.5	6.5	4.5	4.5	5.0	4.0	6.5	5.0	5.5	2.5	6.0	3.0	7.0	6.0	3.0	3.0	7.5
25	4.5	5.5	4.5	7.0	5.0	2.5	3.0	3.0	4.5	7.0	5.5	4.0	3.5	5.5	2.0	4.5	4.0	3.0	3.5	5.0
26	6.0	5.5	6.0	8.5	5.5	3.0	3.5	4.5	5.0	6.0	4.0	4.5	4.0	7.0	3.0	6.0	3.5	4.0	3.0	7.0
27	7.5	6.5	7.0	6.5	6.5	3.5	5.5	3.0	6.5	4.5	5.0	4.0	3.0	7.5	3.0	5.5	4.5	2.5	2.0	6.0
29	5.0	7.5	5.0	5.0	4.5	3.0	4.5	3.5	3.0	7.0	3.5	3.0	3.5	7.0	3.5	6.0	5.0	5.0	2.5	5.0
30	6.0	8.5	6.0	6.0	3.0	4.0	5.0	2.5	4.5	5.5	4.0	3.5	2.5	5.0	3.5	6.0	6.0	4.0	5.0	4.0
31	6.0	4.5	6.5	6.5	4.0	4.5	3.0	3.5	4.0	5.0	2.0	5.0	2.0	6.0	3.0	5.0	6.0	3.5	3.5	4.5
32	6.0	5.0	4.0	5.0	4.5	3.0	2.5	2.0	7.0	6.0	3.0	4.5	2.0	5.5	3.5	7.0	4.0	4.0	5.0	5.0
33	4.5	4.5	4.0	7.5	3.5	4.5	4.0	2.5	5.0	7.5	3.5	3.5	3.5	6.0	3.0	4.0	6.0	3.5	3.0	7.0
34	5.5	6.5	7.0	7.0	4.0	5.0	3.5	3.0	6.0	8.0	2.5	5.0	4.0	6.5	2.5	7.0	4.5	4.0	2.5	6.5
35	6.0	5.0	6.5	8.0	4.0	4.5	3.0	2.5	6.5	7.0	4.0	5.5	3.5	7.0	3.0	6.0	5.5	4.0	2.0	6.0

APPENDIX L

Data of the survey on identifying essential causes for site coordination problems

Data for survey on essential causes of site co-ordinating problems

Case		Question 4															
		a	a	b	b	c	c	d	d	e	e	f	f	g	g	h	h
		F	C	F	C	F	C	F	C	F	C	F	C	F	C	F	C
1		6.0	7.5	4.0	7.0	6.0	7.0	7.0	7.0	5.0	5.0	5.5	4.0	6.0	5.5	4.0	4.0
2		7.0	7.5	5.0	8.0	7.5	8.0	8.0	7.5	6.0	5.5	5.5	4.5	7.0	5.0	6.0	4.0
3		7.5	7.0	4.0	7.5	5.0	8.0	6.0	7.0	5.5	4.0	6.0	4.5	5.0	5.0	4.0	4.5
4		7.5	7.0	6.5	7.0	6.5	8.0	7.5	6.0	5.0	4.5	7.0	5.5	6.0	5.0	4.0	4.0
5		7.5	7.0	7.0	7.5	4.5	6.5	6.0	6.5	5.5	4.0	7.0	5.5	7.0	6.5	5.0	5.5
6		7.0	7.5	7.0	8.0	4.0	7.0	7.0	7.0	6.5	5.5	7.0	6.5	8.0	3.0	5.5	6.0
7		7.0	8.0	7.0	6.0	5.0	7.5	8.0	7.5	6.5	6.0	6.5	5.0	7.0	3.5	4.0	6.5
8		6.0	8.0	8.0	5.0	6.0	5.0	6.5	7.0	7.0	6.5	6.0	4.5	5.0	5.0	4.5	4.0
9		6.5	7.5	6.5	6.5	4.0	6.0	6.0	6.5	6.5	3.5	6.5	5.0	4.0	6.0	3.5	3.5
10		6.5	7.0	6.5	7.0	3.5	7.5	6.5	6.0	7.5	3.5	6.0	4.0	5.0	4.5	5.0	3.0
11		7.0	6.5	7.5	7.5	5.0	8.0	7.0	6.0	7.0	5.5	7.0	4.0	6.0	3.0	6.5	3.5
12		7.5	6.0	5.5	8.0	6.0	7.0	7.0	7.0	7.5	6.0	7.5	3.5	7.0	3.5	6.0	5.0
13		8.0	6.5	6.5	8.0	4.0	7.0	5.5	8.0	7.0	6.5	5.0	4.0	6.5	5.0	4.0	4.5
14		8.0	6.0	7.0	7.5	5.0	7.5	6.5	7.0	6.5	5.0	6.5	5.0	5.0	5.5	3.5	5.0
15		7.5	7.0	7.0	7.0	6.5	5.0	7.0	8.0	7.0	3.5	7.0	5.0	5.5	5.0	3.5	2.0
16		7.5	7.0	8.0	5.5	5.0	6.5	7.5	7.5	7.5	4.0	8.0	6.0	6.0	6.5	3.0	2.5
17		7.5	7.5	6.5	6.5	6.0	7.0	5.0	6.0	8.0	5.0	7.5	7.0	7.0	7.0	4.5	6.0
18		6.5	7.0	6.5	7.0	4.0	7.0	6.0	6.0	6.5	3.5	7.5	7.0	6.0	4.0	5.0	6.5
19		7.0	8.0	5.0	8.0	3.5	8.0	7.0	7.0	6.0	3.0	6.5	5.0	7.0	4.5	5.0	5.0
20		7.0	5.5	5.0	8.0	5.0	5.0	7.0	7.5	6.5	4.0	6.0	3.5	7.0	5.0	4.0	4.5
21		8.0	7.0	6.0	5.0	4.0	7.0	8.0	7.0	5.0	4.0	6.5	5.0	6.5	5.0	3.0	5.0
22		8.5	7.0	7.0	5.5	5.0	8.5	5.5	5.5	6.0	6.0	6.5	4.0	5.0	5.5	3.0	5.0
23		8.0	7.5	7.5	6.0	6.5	5.0	6.0	7.5	7.0	5.5	8.0	4.5	6.0	6.0	4.5	6.0
24		7.5	7.0	6.5	7.0	4.0	7.0	7.5	8.0	7.5	5.0	6.0	6.0	7.0	4.5	5.0	4.5
25		7.0	6.0	8.0	6.5	5.0	6.0	5.0	5.5	6.0	4.5	5.5	5.5	5.5	4.0	6.0	5.5
26		6.0	7.5	5.0	8.0	6.0	7.0	5.5	7.0	6.5	3.0	6.0	5.0	5.0	4.4	4.5	4.0
27		5.0	6.5	7.5	7.5	7.0	7.5	7.0	6.0	6.5	4.0	6.5	6.5	5.0	5.5	4.0	3.5
29		5.0	7.5	6.0	6.0	4.5	8.0	6.5	5.0	6.0	5.5	7.0	5.0	5.5	5.0	5.5	5.0
30		5.5	7.0	5.0	7.5	3.0	8.0	6.0	6.5	7.0	6.0	7.5	4.0	5.0	4.5	5.0	4.5
31		8.0	8.0	8.0	6.5	4.5	6.5	6.0	7.0	7.5	5.4	7.0	4.5	6.0	6.0	6.0	4.0
32		8.5	6.5	7.0	7.0	5.5	5.5	7.0	7.5	6.5	6.0	6.5	6.0	6.0	6.0	3.5	3.0
33		7.0	7.5	6.5	7.5	5.0	7.0	7.5	7.5	7.0	6.5	7.5	7.0	7.0	5.5	4.0	3.5
34		8.0	7.0	5.0	8.0	6.0	7.5	8.0	7.0	7.0	5.0	6.5	5.0	8.0	3.5	4.5	4.0
35		8.0	7.5	7.0	7.5	6.5	8.0	8.0	7.5	6.5	4.5	6.0	5.0	5.5	4.0	5.0	4.5
36		7.0	7.5	7.5	8.0	7.0	7.0	6.0	7.5	7.0	4.0	7.0	4.0	6.0	5.0	4.5	4.0

Case	i	i	j	j	k	k	l	l	m	m	n	n	o	o	p	p
	F	C	F	C	F	C	F	C	F	C	F	C	F	C	F	C
1	4.5	2.5	5.0	2.0	6.0	6.0	5.0	6.5	5.5	4.0	7.0	6.0	5.0	6.0	5.0	5.0
2	3.0	4.0	6.0	2.5	6.0	6.5	7.0	6.7	7.0	4.5	6.0	6.5	6.0	6.0	4.0	5.5
3	5.0	3.5	6.5	3.0	6.0	5.0	4.5	6.5	6.0	3.5	8.0	5.0	7.0	6.0	5.0	4.5
4	3.5	2.5	5.0	3.5	4.0	8.0	4.0	6.0	6.0	6.0	4.5	5.5	7.5	6.5	4.5	3.5
5	4.0	5.0	5.0	5.0	7.0	8.0	3.0	7.5	3.5	6.5	7.0	5.0	5.0	7.0	3.5	5.0
6	3.5	6.5	4.0	6.0	7.5	7.5	3.5	5.5	5.0	6.5	6.5	5.0	6.0	7.5	4.0	6.0
7	2.0	3.4	4.5	4.5	7.5	5.0	2.0	5.5	5.0	7.0	7.0	4.5	7.0	5.0	5.0	7.0
8	3.5	4.5	3.5	3.5	7.0	6.0	2.0	6.5	6.0	7.0	8.0	5.5	3.0	5.5	6.0	7.5
9	5.5	2.0	5.0	2.0	6.5	7.0	4.5	5.5	6.0	8.0	7.0	6.0	4.5	5.0	5.5	3.0
10	2.5	2.5	6.0	2.0	7.0	8.0	4.0	4.5	7.5	6.5	6.5	6.0	6.5	4.0	5.0	3.0
11	3.0	2.5	7.5	2.5	7.5	7.0	5.0	6.5	8.0	6.0	5.5	7.5	7.5	3.5	6.0	3.5
12	1.5	6.0	6.5	5.0	8.0	7.5	3.5	7.0	4.0	7.0	6.0	7.0	7.0	5.0	6.5	5.0
13	2.5	5.0	7.5	2.5	8.0	7.0	5.0	8.0	5.5	7.5	7.0	8.0	3.5	5.5	7.0	5.0
14	3.0	5.0	4.0	3.0	6.5	8.0	4.0	8.0	6.5	5.0	6.0	6.5	5.0	6.0	4.0	6.0
15	3.5	3.5	3.0	3.5	7.5	7.5	3.5	7.5	5.0	6.0	5.5	4.0	4.0	4.5	4.5	6.0
16	2.0	3.5	3.5	2.0	7.0	7.0	2.0	7.5	6.0	6.5	6.5	5.0	3.5	4.5	5.0	7.5
17	3.0	4.0	5.0	2.5	7.0	7.0	2.5	7.0	5.0	7.0	7.5	5.5	3.5	5.0	6.0	5.0
18	1.5	4.5	5.0	2.0	7.5	7.0	2.0	8.0	6.0	7.0	6.0	6.0	3.0	6.5	6.5	6.0
19	4.0	3.0	5.0	2.0	6.5	5.0	4.0	7.5	5.5	5.0	7.0	6.0	4.0	5.5	3.5	6.0
20	3.0	2.0	6.5	3.5	7.5	6.0	3.5	7.0	6.5	7.0	6.0	6.0	5.0	4.0	6.0	5.0
21	3.5	2.5	5.0	4.0	8.0	6.5	4.0	7.5	8.0	7.0	6.0	4.5	6.0	6.5	6.0	5.5
22	2.0	5.5	5.0	4.5	7.0	7.5	3.0	5.0	6.0	6.5	5.5	5.5	4.0	6.0	5.5	4.0
23	3.5	4.5	4.0	3.0	8.0	7.0	3.5	6.0	8.0	6.0	6.0	5.0	7.0	5.5	4.0	5.0
24	3.0	4.5	3.0	4.0	5.0	6.0	4.0	7.5	5.0	7.0	4.5	5.0	6.0	7.0	5.0	5.0
25	4.0	3.0	4.0	3.0	8.0	6.5	6.0	6.0	5.5	8.0	7.0	4.0	6.0	6.5	6.0	6.5
26	4.5	3.0	4.5	2.5	6.5	7.5	5.5	7.0	6.0	6.5	5.5	5.0	4.5	6.0	6.5	7.0
27	3.5	5.0	3.5	3.0	5.0	8.0	4.0	8.0	7.0	7.0	6.0	6.0	4.0	6.5	5.0	6.0
29	2.5	5.5	5.0	2.0	7.0	6.0	3.0	5.0	6.0	6.0	8.0	6.5	5.0	5.0	4.0	6.5
30	3.0	4.5	5.5	4.0	7.5	6.5	3.3	6.5	6.5	5.0	7.5	6.0	5.5	6.0	5.5	4.5
31	2.0	3.0	5.0	4.5	7.0	7.0	3.0	5.5	5.5	6.5	8.0	7.0	6.0	5.0	5.0	5.0
32	2.0	6.0	5.5	3.0	6.5	7.0	5.0	7.0	5.0	5.5	5.0	8.0	5.5	3.5	6.5	5.0
33	3.0	2.5	7.0	3.5	6.5	7.5	4.0	7.0	4.5	4.5	7.5	7.5	6.0	5.0	3.0	4.0
34	3.5	3.5	6.0	2.0	7.5	8.0	3.0	7.5	4.5	5.0	7.5	6.0	4.5	6.0	6.5	5.0
35	3.0	3.5	7.0	2.5	6.0	8.0	2.0	8.0	3.5	6.0	6.0	5.0	5.0	4.5	5.0	4.0
36	4.0	5.0	6.0	3.0	7.0	8.0	2.5	5.5	5.0	6.5	8.0	6.0	5.5	5.0	5.0	5.0

APPENDIX M

SPSS regression printouts for site coordination problems analysis

SPSS regression printouts for time performance analysis

ANOVA[e]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153.398	6	25.566	24.923	.000[a]
	Residual	110.789	108	1.026		
	Total	264.187	114			
2	Regression	153.398	5	30.680	30.184	.000[b]
	Residual	110.789	109	1.016		
	Total	264.187	114			
3	Regression	153.305	4	38.326	38.022	.000[c]
	Residual	110.882	110	1.008		
	Total	264.187	114			
4	Regression	152.483	3	50.828	50.507	.000[d]
	Residual	111.704	111	1.006		
	Total	264.187	114			

a. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4, SCP_2, SCP_1

b. Predictors: (Constant), SCP_6, SCP_3, SCP_4, SCP_2, SCP_1

c. Predictors: (Constant), SCP_6, SCP_3, SCP_2, SCP_1

d. Predictors: (Constant), SCP_3, SCP_2, SCP_1

e. Dependent Variable: TIME

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	11.645	.500		23.287	.000	10.654	12.636			
	SCP_1	-.229	.103	-.209	-2.226	.028	-.432	-.025	-.627	-.209	-.139
	SCP_2	-.343	.097	-.315	-3.550	.001	-.534	-.151	-.650	-.323	-.221
	SCP_3	-.314	.092	-.307	-3.407	.001	-.497	-.131	-.666	-.312	-.212
	SCP_4	-3.097E-02	.104	-.028	-.298	.766	-.237	.175	-.560	-.029	-.019
	SCP_5	1.002E-03	.087	.001	.012	.991	-.171	.173	-.392	.001	.001
	SCP_6	-6.766E-02	.082	-.061	-.826	.411	-.230	.095	-.411	-.079	-.051
2	(Constant)	11.647	.479		24.331	.000	10.698	12.595			
	SCP_1	-.229	.102	-.209	-2.241	.027	-.431	-.026	-.627	-.210	-.139
	SCP_2	-.342	.095	-.315	-3.588	.001	-.532	-.153	-.650	-.325	-.223
	SCP_3	-.314	.090	-.307	-3.479	.001	-.493	-.135	-.666	-.316	-.216
	SCP_4	-3.074E-02	.102	-.028	-.302	.763	-.232	.171	-.560	-.029	-.019
	SCP_6	-6.747E-02	.080	-.061	-.844	.400	-.226	.091	-.411	-.081	-.052
3	(Constant)	11.594	.444		26.140	.000	10.715	12.472			
	SCP_1	-.239	.095	-.219	-2.507	.014	-.428	-.050	-.627	-.232	-.155
	SCP_2	-.354	.087	-.325	-4.058	.000	-.527	-.181	-.650	-.361	-.251
	SCP_3	-.315	.090	-.308	-3.516	.001	-.493	-.138	-.666	-.318	-.217
	SCP_6	-7.107E-02	.079	-.064	-.903	.368	-.227	.085	-.411	-.086	-.056
4	(Constant)	11.384	.378		30.126	.000	10.635	12.133			
	SCP_1	-.259	.093	-.237	-2.798	.006	-.443	-.076	-.627	-.257	-.173
	SCP_2	-.368	.086	-.338	-4.291	.000	-.538	-.198	-.650	-.377	-.265
	SCP_3	-.320	.089	-.313	-3.581	.001	-.498	-.143	-.666	-.322	-.221

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
TIME	6.948	1.5223	115
SCP_1	4.935	1.3916	115
SCP_2	4.400	1.3989	115
SCP_3	4.796	1.4881	115
SCP_4	5.961	1.3815	115
SCP_5	5.070	1.3227	115
SCP_6	5.548	1.3701	115

Correlations

		TIME	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	TIME	1.000	-.627	-.650	-.666	-.560	-.392	-.411
	SCP_1	-.627	1.000	.545	.655	.641	.374	.448
	SCP_2	-.650	.545	1.000	.583	.646	.446	.403
	SCP_3	-.666	.655	.583	1.000	.547	.446	.382
	SCP_4	-.560	.641	.646	.547	1.000	.474	.445
	SCP_5	-.392	.374	.446	.446	.474	1.000	.400
	SCP_6	-.411	.448	.403	.382	.445	.400	1.000
Sig. (1-tailed)	TIME	.	.000	.000	.000	.000	.000	.000
	SCP_1	.000	.	.000	.000	.000	.000	.000
	SCP_2	.000	.000	.	.000	.000	.000	.000
	SCP_3	.000	.000	.000	.	.000	.000	.000
	SCP_4	.000	.000	.000	.000	.	.000	.000
	SCP_5	.000	.000	.000	.000	.000	.	.000
	SCP_6	.000	.000	.000	.000	.000	.000	.
N	TIME	115	115	115	115	115	115	115
	SCP_1	115	115	115	115	115	115	115
	SCP_2	115	115	115	115	115	115	115
	SCP_3	115	115	115	115	115	115	115
	SCP_4	115	115	115	115	115	115	115
	SCP_5	115	115	115	115	115	115	115
	SCP_6	115	115	115	115	115	115	115

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_3, SCP_5, SCP_4, SCP_2, SCP_1[a]	.	Enter
2	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_4	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: TIME

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.762[a]	.581	.557	1.0128	.581	24.923	6	108	.000
2	.762[b]	.581	.561	1.0082	.000	.000	1	110	.991
3	.762[c]	.580	.565	1.0040	.000	.091	1	111	.763
4	.760[d]	.577	.566	1.0032	-.003	.816	1	112	.368

a. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4, SCP_2, SCP_1

Model	Entered	Removed	Method
1	SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4[a]	.	Enter
2	.	SCP_3	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_1	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: TIME

Model Summary[e]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.906[a]	.821	.791	.8760	.821	27.432	6	36	.000
2	.905[b]	.818	.794	.8694	-.002	.442	1	38	.510
3	.898[c]	.806	.786	.8856	-.012	2.426	1	39	.128
4	.890[d]	.792	.776	.9054	-.014	2.768	1	40	.104

a. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4

b. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_1, SCP_4

c. Predictors: (Constant), SCP_6, SCP_2, SCP_1, SCP_4

d. Predictors: (Constant), SCP_6, SCP_2, SCP_4

e. Dependent Variable: TIME

ANOVA[e]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	126.314	6	21.052	27.432	.000[a]
	Residual	27.628	36	.767		
	Total	153.942	42			
2	Regression	125.975	5	25.195	33.332	.000[b]
	Residual	27.967	37	.756		
	Total	153.942	42			
3	Regression	124.141	4	31.035	39.574	.000[c]
	Residual	29.801	38	.784		
	Total	153.942	42			
4	Regression	121.970	3	40.657	49.593	.000[d]
	Residual	31.972	39	.820		
	Total	153.942	42			

a. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4

b. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_1, SCP_4

c. Predictors: (Constant), SCP_6, SCP_2, SCP_1, SCP_4

d. Predictors: (Constant), SCP_6, SCP_2, SCP_4

e. Dependent Variable: TIME

Analysis for SP-Time-Fin

		Collinearity Statistics	
Model		Tolerance	VIF
1	(Constant)		
	SCP_1	.440	2.271
	SCP_2	.494	2.026
	SCP_3	.478	2.092
	SCP_4	.436	2.292
	SCP_5	.684	1.461
	SCP_6	.714	1.400
2	(Constant)		
	SCP_1	.442	2.262
	SCP_2	.500	2.001
	SCP_3	.494	2.022
	SCP_4	.452	2.212
	SCP_6	.744	1.345
3	(Constant)		
	SCP_1	.501	1.995
	SCP_2	.594	1.684
	SCP_3	.496	2.016
	SCP_6	.761	1.315
4	(Constant)		
	SCP_1	.530	1.886
	SCP_2	.613	1.630
	SCP_3	.498	2.008

a. Dependent Variable: TIME

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
TIME	6.674	1.9145	43
SCP_1	4.849	1.4123	43
SCP_2	4.419	1.5884	43
SCP_3	5.035	1.4573	43
SCP_4	5.884	1.3837	43
SCP_5	4.872	1.5004	43
SCP_6	5.302	1.4357	43

Correlations

		TIME	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	TIME	1.000	-.763	-.823	-.683	-.781	-.529	-.648
	SCP_1	-.763	1.000	.692	.633	.716	.302	.566
	SCP_2	-.823	.692	1.000	.662	.721	.465	.481
	SCP_3	-.683	.633	.662	1.000	.516	.429	.592
	SCP_4	-.781	.716	.721	.516	1.000	.388	.563
	SCP_5	-.529	.302	.465	.429	.388	1.000	.447
	SCP_6	-.648	.566	.481	.592	.563	.447	1.000
Sig. (1-tailed)	TIME	.	.000	.000	.000	.000	.000	.000
	SCP_1	.000	.	.000	.000	.000	.024	.000
	SCP_2	.000	.000	.	.000	.000	.001	.001
	SCP_3	.000	.000	.000	.	.000	.002	.000
	SCP_4	.000	.000	.000	.000	.	.005	.000
	SCP_5	.000	.024	.001	.002	.005	.	.001
	SCP_6	.000	.000	.001	.000	.000	.001	.
N	TIME	43	43	43	43	43	43	43
	SCP_1	43	43	43	43	43	43	43
	SCP_2	43	43	43	43	43	43	43
	SCP_3	43	43	43	43	43	43	43
	SCP_4	43	43	43	43	43	43	43
	SCP_5	43	43	43	43	43	43	43
	SCP_6	43	43	43	43	43	43	43

Analysis for SP-Time-Fin

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
TIME	7.221	1.4626	34
SCP_1	4.779	1.3495	34
SCP_2	4.603	1.2600	34
SCP_3	4.662	1.3184	34
SCP_4	5.838	1.4705	34
SCP_5	5.412	1.1446	34
SCP_6	5.412	1.2335	34

Correlations

		TIME	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	TIME	1.000	-.692	-.724	-.742	-.532	-.409	-.346
	SCP_1	-.692	1.000	.593	.659	.569	.531	.161
	SCP_2	-.724	.593	1.000	.633	.655	.506	.415
	SCP_3	-.742	.659	.633	1.000	.592	.421	.228
	SCP_4	-.532	.569	.655	.592	1.000	.468	.368
	SCP_5	-.409	.531	.506	.421	.468	1.000	.327
	SCP_6	-.346	.161	.415	.228	.368	.327	1.000
Sig. (1-tailed)	TIME	.	.000	.000	.000	.001	.008	.023
	SCP_1	.000	.	.000	.000	.000	.001	.182
	SCP_2	.000	.000	.	.000	.000	.001	.007
	SCP_3	.000	.000	.000	.	.000	.007	.097
	SCP_4	.001	.000	.000	.000	.	.003	.016
	SCP_5	.008	.001	.001	.007	.003	.	.030
	SCP_6	.023	.182	.007	.097	.016	.030	.
N	TIME	34	34	34	34	34	34	34
	SCP_1	34	34	34	34	34	34	34
	SCP_2	34	34	34	34	34	34	34
	SCP_3	34	34	34	34	34	34	34
	SCP_4	34	34	34	34	34	34	34
	SCP_5	34	34	34	34	34	34	34
	SCP_6	34	34	34	34	34	34	34

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2[a]	.	Enter
2	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_4	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: TIME

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.844[a]	.712	.648	.8684	.712	11.103	6	27	.000
2	.840[b]	.706	.654	.8608	-.005	.514	1	29	.480
3	.836[c]	.698	.657	.8571	-.008	.752	1	30	.393
4	.831[d]	.691	.660	.8533	-.008	.731	1	31	.400

Analysis for SP-Time-Str

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	13.896	.688		20.185	.000	12.500	15.292			
	SCP_1	-.265	.160	-.196	-1.662	.105	-.589	.058	-.763	-.267	-.117
	SCP_2	-.429	.149	-.356	-2.886	.007	-.731	-.128	-.823	-.434	-.204
	SCP_3	-9.444E-02	.142	-.072	-.665	.510	-.383	.194	-.683	-.110	-.047
	SCP_4	-.300	.164	-.216	-1.830	.076	-.632	.032	-.781	-.292	-.129
	SCP_5	-.158	.108	-.124	-1.459	.153	-.378	.062	-.529	-.236	-.103
	SCP_6	-.194	.132	-.146	-1.471	.150	-.462	.074	-.648	-.238	-.104
2	(Constant)	13.794	.666		20.708	.000	12.445	15.144			
	SCP_1	-.293	.153	-.216	-1.918	.063	-.603	.017	-.763	-.301	-.134
	SCP_2	-.466	.137	-.386	-3.390	.002	-.744	-.187	-.823	-.487	-.238
	SCP_4	-.280	.160	-.203	-1.752	.088	-.604	.044	-.781	-.277	-.123
	SCP_5	-.166	.107	-.130	-1.558	.128	-.383	.050	-.529	-.248	-.109
	SCP_6	-.223	.124	-.167	-1.798	.080	-.474	.028	-.648	-.283	-.126
3	(Constant)	13.456	.641		20.977	.000	12.158	14.755			
	SCP_1	-.256	.154	-.189	-1.664	.104	-.567	.055	-.763	-.261	-.119
	SCP_2	-.530	.133	-.440	-3.974	.000	-.800	-.260	-.823	-.542	-.284
	SCP_4	-.290	.163	-.209	-1.779	.083	-.619	.040	-.781	-.277	-.127
	SCP_6	-.282	.120	-.211	-2.345	.024	-.525	-.039	-.648	-.356	-.167
4	(Constant)	13.375	.654		20.453	.000	12.053	14.698			
	SCP_2	-.607	.128	-.503	-4.735	.000	-.866	-.347	-.823	-.604	-.346
	SCP_4	-.384	.156	-.277	-2.458	.019	-.699	-.068	-.781	-.366	-.179
	SCP_6	-.333	.119	-.249	-2.800	.008	-.573	-.092	-.648	-.409	-.204

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SCP_1	.359	2.782
	SCP_2	.327	3.057
	SCP_3	.426	2.345
	SCP_4	.356	2.808
	SCP_5	.692	1.446
	SCP_6	.509	1.966
2	(Constant)		
	SCP_1	.386	2.590
	SCP_2	.378	2.646
	SCP_4	.368	2.720
	SCP_5	.701	1.426
	SCP_6	.569	1.758
3	(Constant)		
	SCP_1	.396	2.527
	SCP_2	.416	2.405
	SCP_4	.368	2.716
	SCP_6	.628	1.594
4	(Constant)		
	SCP_2	.471	2.121
	SCP_4	.419	2.389
	SCP_6	.671	1.490

a. Dependent Variable: TIME

Analysis for SP-Time-Fin

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	SCP_1	.442	2.263
	SCP_2	.414	2.417
	SCP_3	.456	2.194
	SCP_4	.478	2.090
	SCP_5	.630	1.588
	SCP_6	.762	1.312
2	(Constant)		
	SCP_1	.486	2.058
	SCP_2	.422	2.372
	SCP_3	.456	2.193
	SCP_4	.483	2.072
	SCP_6	.788	1.269
3	(Constant)		
	SCP_1	.508	1.969
	SCP_2	.469	2.131
	SCP_3	.475	2.105
	SCP_6	.816	1.225
4	(Constant)		
	SCP_1	.514	1.947
	SCP_2	.545	1.835
	SCP_3	.475	2.105

a. Dependent Variable: TIME

1	Regression	50.235	6	8.373	11.103	.000a
	Residual	20.360	27	.754		
	Total	70.596	33			
2	Regression	49.848	5	9.970	13.454	.000b
	Residual	20.748	28	.741		
	Total	70.596	33			
3	Regression	49.290	4	12.323	16.773	.000c
	Residual	21.305	29	.735		
	Total	70.596	33			
4	Regression	48.753	3	16.251	22.320	.000d
	Residual	21.842	30	.728		
	Total	70.596	33			

a. Predictors: (Constant), SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2

b. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3, SCP_2

c. Predictors: (Constant), SCP_6, SCP_1, SCP_3, SCP_2

d. Predictors: (Constant), SCP_1, SCP_3, SCP_2

e. Dependent Variable: TIME

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
TIME	6.98750	1.227294	40
SCP1	5.13750	1.493522	40
SCP2	4.21250	1.381598	40
SCP3	4.68750	1.723471	40
SCP4	6.11250	1.389002	40
SCP5	4.97500	1.300641	40
SCP6	5.93750	1.378347	40

Correlations

		TIME	SCP1	SCP2	SCP3	SCP4	SCP5	SCP6
Pearson Correlation	TIME	1.000	-.513	-.418	-.711	-.371	-.394	-.258
	SCP1	-.513	1.000	.467	.739	.669	.500	.549
	SCP2	-.418	.467	1.000	.559	.652	.453	.451
	SCP3	-.711	.739	.559	1.000	.618	.614	.402
	SCP4	-.371	.669	.652	.618	1.000	.722	.412
	SCP5	-.394	.500	.453	.614	.722	1.000	.510
	SCP6	-.258	.549	.451	.402	.412	.510	1.000
Sig. (1-tailed)	TIME	.	.000	.004	.000	.009	.006	.054
	SCP1	.000	.	.001	.000	.000	.001	.000
	SCP2	.004	.001	.	.000	.000	.002	.002
	SCP3	.000	.000	.000	.	.000	.000	.005
	SCP4	.009	.000	.000	.000	.	.000	.004
	SCP5	.006	.001	.002	.000	.000	.	.000
	SCP6	.054	.000	.002	.005	.004	.000	.
N	TIME	40	40	40	40	40	40	40
	SCP1	40	40	40	40	40	40	40
	SCP2	40	40	40	40	40	40	40
	SCP3	40	40	40	40	40	40	40
	SCP4	40	40	40	40	40	40	40
	SCP5	40	40	40	40	40	40	40
	SCP6	40	40	40	40	40	40	40

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	12.299	.897		13.711	.000	10.459	14.140			
	SCP_1	-.350	.169	-.323	-2.079	.047	-.696	-.005	-.692	-.372	-.215
	SCP_2	-.421	.187	-.363	-2.258	.032	-.804	-.039	-.724	-.399	-.233
	SCP_3	-.420	.170	-.379	-2.473	.020	-.769	-.072	-.742	-.430	-.256
	SCP_4	.117	.149	.118	.790	.436	-.188	.422	-.532	.150	.082
	SCP_5	.119	.166	.093	.717	.480	-.222	.461	-.409	.137	.074
	SCP_6	-.155	.140	-.131	-1.103	.280	-.443	.133	-.346	-.208	-.114
2	(Constant)	12.542	.824		15.225	.000	10.854	14.229			
	SCP_1	-.314	.159	-.290	-1.971	.059	-.640	.012	-.692	-.349	-.202
	SCP_2	-.403	.183	-.347	-2.200	.036	-.778	-.028	-.724	-.384	-.225
	SCP_3	-.422	.168	-.381	-2.510	.018	-.767	-.078	-.742	-.429	-.257
	SCP_4	.127	.147	.128	.867	.393	-.173	.428	-.532	.162	.089
	SCP_6	-.137	.137	-.115	-.998	.327	-.417	.144	-.346	-.185	-.102
3	(Constant)	12.658	.809		15.640	.000	11.002	14.313			
	SCP_1	-.285	.155	-.263	-1.839	.076	-.603	.032	-.692	-.323	-.188
	SCP_2	-.352	.173	-.303	-2.038	.051	-.706	.001	-.724	-.354	-.208
	SCP_3	-.393	.164	-.354	-2.394	.023	-.729	-.057	-.742	-.406	-.244
	SCP_6	-.114	.134	-.097	-.855	.400	-.388	.159	-.346	-.157	-.087
4	(Constant)	12.227	.631		19.377	.000	10.939	13.516			
	SCP_1	-.271	.154	-.250	-1.766	.088	-.585	.042	-.692	-.307	-.179
	SCP_2	-.407	.160	-.351	-2.551	.016	-.733	-.081	-.724	-.422	-.259
	SCP_3	-.394	.163	-.355	-2.409	.022	-.728	-.060	-.742	-.403	-.245

ANOVA[g]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.644	6	5.107	5.998	.000[a]
	Residual	28.100	33	.852		
	Total	58.744	39			
2	Regression	30.597	5	6.119	7.392	.000[b]
	Residual	28.146	34	.828		
	Total	58.744	39			
3	Regression	30.502	4	7.626	9.451	.000[c]
	Residual	28.241	35	.807		
	Total	58.744	39			
4	Regression	30.457	3	10.152	12.920	.000[d]
	Residual	28.287	36	.786		
	Total	58.744	39			
5	Regression	30.135	2	15.067	19.487	.000[e]
	Residual	28.609	37	.773		
	Total	58.744	39			
6	Regression	29.700	1	29.700	38.859	.000[f]
	Residual	29.044	38	.764		
	Total	58.744	39			

a. Predictors: (Constant), SCP6, SCP3, SCP2, SCP5, SCP1, SCP4
b. Predictors: (Constant), SCP6, SCP3, SCP2, SCP1, SCP4
c. Predictors: (Constant), SCP6, SCP3, SCP2, SCP4
d. Predictors: (Constant), SCP3, SCP2, SCP4
e. Predictors: (Constant), SCP3, SCP4
f. Predictors: (Constant), SCP3
g. Dependent Variable: TIME

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	8.906	.787		11.311	.000	7.304	10.508			
	SCP1	-7.529E-02	.190	-.092	-.397	.694	-.461	.310	-.513	-.069	-.048
	SCP2	-.120	.161	-.135	-.745	.462	-.446	.207	-.418	-.129	-.090
	SCP3	-.498	.154	-.700	-3.227	.003	-.812	-.184	-.711	-.490	-.339
	SCP4	.191	.215	.216	.888	.381	-.247	.630	-.371	.153	.107
	SCP5	-4.659E-02	.199	-.049	-.234	.816	-.452	.359	-.394	-.041	-.028
	SCP6	6.226E-02	.151	.070	.413	.682	-.244	.369	-.258	.072	.050
2	(Constant)	8.907	.776		11.472	.000	7.329	10.485			
	SCP1	-5.865E-02	.173	-.071	-.339	.737	-.411	.293	-.513	-.058	-.040
	SCP2	-.108	.151	-.122	-.717	.478	-.416	.199	-.418	-.122	-.085
	SCP3	-.514	.136	-.722	-3.792	.001	-.790	-.239	-.711	-.545	-.450
	SCP4	.160	.166	.181	.964	.342	-.177	.496	-.371	.163	.114
	SCP6	4.624E-02	.132	.052	.349	.729	-.223	.315	-.258	.060	.041
3	(Constant)	8.922	.765		11.658	.000	7.368	10.475			
	SCP2	-9.759E-02	.146	-.110	-.669	.508	-.394	.199	-.418	-.112	-.078
	SCP3	-.540	.111	-.758	-4.859	.000	-.766	-.314	-.711	-.635	-.570
	SCP4	.137	.150	.155	.915	.366	-.167	.442	-.371	.153	.107
	SCP6	2.859E-02	.120	.032	.238	.813	-.215	.272	-.258	.040	.028
4	(Constant)	9.018	.641		14.066	.000	7.718	10.318			
	SCP2	-8.984E-02	.140	-.101	-.640	.526	-.375	.195	-.418	-.106	-.074
	SCP3	-.536	.109	-.753	-4.942	.000	-.756	-.316	-.711	-.636	-.572
	SCP4	.141	.147	.160	.958	.345	-.158	.440	-.371	.158	.111
5	(Constant)	8.996	.635		14.165	.000	7.709	10.282			
	SCP3	-.554	.104	-.779	-5.338	.000	-.765	-.344	-.711	-.660	-.612
	SCP4	9.667E-02	.129	.109	.750	.458	-.164	.358	-.371	.122	.086
6	(Constant)	9.361	.405		23.110	.000	8.541	10.181			
	SCP3	-.506	.081	-.711	-6.234	.000	-.671	-.342	-.711	-.711	-.711

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP6, SCP3, SCP2, SCP5, SCP1, SCP4[a]	.	Enter
2	.	SCP5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP1	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP6	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP2	Backward (criterion: Probability of F-to-remove >= .100).
6	.	SCP4	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: TIME

M[illegible] Summary[g]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.722[a]	.522	.433	.922772	.522	5.998	6	33	.000
2	.722[b]	.521	.450	.909854	-.001	.055	1	35	.816
3	.721[c]	.519	.464	.898273	-.002	.115	1	36	.737
4	.720[d]	.518	.478	.886426	-.001	.057	1	37	.813
5	.716[e]	.513	.487	.879324	-.005	.409	1	38	.526
6	.711[f]	.506	.493	.874248	-.007	.563	1	39	.458

a. Predictors: (Constant), SCP6, SCP3, SCP2, SCP5, SCP1, SCP4
b. Predictors: (Constant), SCP6, SCP3, SCP2, SCP1, SCP4
c. Predictors: (Constant), SCP6, SCP3, SCP2, SCP4
d. Predictors: (Constant), SCP3, SCP2, SCP4
e. Predictors: (Constant), SCP3, SCP4
f. Predictors: (Constant), SCP3
g. Dependent Variable: TIME

Analysis for SP-Time-BS

SPSS regression printouts for cost performance analysis

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.506[a]	.256	.215	1.1523	.256	6.260	6	109	.000
2	.506[b]	.256	.222	1.1471	.000	.017	1	111	.897
3	.505[c]	.255	.228	1.1426	-.001	.128	1	112	.722
4	.501[d]	.251	.231	1.1409	-.005	.672	1	113	.414
5	.496[e]	.246	.233	1.1392	-.004	.666	1	114	.416

a. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4, SCP_2, SCP_1
b. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4, SCP_2
c. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4
d. Predictors: (Constant), SCP_6, SCP_3, SCP_4
e. Predictors: (Constant), SCP_3, SCP_4
f. Dependent Variable: COST

ANOVA[f]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.869	6	8.311	6.260	.000[a]
	Residual	144.721	109	1.328		
	Total	194.589	115			
2	Regression	49.846	5	9.969	7.576	.000[b]
	Residual	144.743	110	1.316		
	Total	194.589	115			
3	Regression	49.679	4	12.420	9.513	.000[c]
	Residual	144.911	111	1.306		
	Total	194.589	115			
4	Regression	48.802	3	16.267	12.497	.000[d]
	Residual	145.787	112	1.302		
	Total	194.589	115			
5	Regression	47.935	2	23.968	18.468	.000[e]
	Residual	146.654	113	1.298		
	Total	194.589	115			

a. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4, SCP_2, SCP_1
b. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4, SCP_2
c. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_4
d. Predictors: (Constant), SCP_6, SCP_3, SCP_4
e. Predictors: (Constant), SCP_3, SCP_4
f. Dependent Variable: COST

Coefficients[a]

Model		Unstandardized Coefficients: B	Std. Error	Standardized Coefficients: Beta	t	Sig.	95% Confidence Interval for B: Lower Bound	Upper Bound	Correlations: Zero-order	Partial	Part
1	(Constant)	9.552	.552		17.312	.000	8.458	10.645			
	SCP_1	1.503E-02	.116	.016	.129	.897	-.215	.246	-.373	.012	.011
	SCP_2	-3.976E-02	.110	-.044	-.362	.718	-.257	.178	-.367	-.035	-.030
	SCP_3	-.308	.106	-.358	-2.916	.004	-.517	-.099	-.471	-.269	-.241
	SCP_4	-.162	.119	-.175	-1.371	.173	-.397	.072	-.398	-.130	-.113
	SCP_5	8.373E-02	.098	.087	.854	.395	-.111	.278	-.223	.081	.071
	SCP_6	-8.670E-02	.093	-.092	-.911	.354	-.271	.098	-.294	-.089	-.077
2	(Constant)	9.555	.549		17.408	.000	8.467	10.642			
	SCP_2	-3.896E-02	.109	-.043	-.357	.722	-.255	.177	-.367	-.034	-.029
	SCP_3	-.302	.096	-.352	-3.155	.002	-.492	-.112	-.471	-.288	-.259
	SCP_4	-.157	.110	-.169	-1.424	.157	-.375	.061	-.398	-.135	-.117
	SCP_5	8.306E-02	.098	.086	.852	.396	-.110	.276	-.223	.081	.070
	SCP_6	-8.461E-02	.091	-.090	-.926	.356	-.266	.096	-.294	-.088	-.076
3	(Constant)	9.568	.545		17.546	.000	8.488	10.649			
	SCP_3	-.313	.090	-.365	-3.480	.001	-.492	-.135	-.471	-.314	-.28[illegible]
	SCP_4	-.173	.100	-.186	-1.722	.088	-.372	.026	-.398	-.161	-.14[illegible]
	SCP_5	7.907E-02	.096	.082	.819	.414	-.112	.270	-.223	.078	.067
	SCP_6	-8.749E-02	.091	-.093	-.965	.336	-.267	.092	-.294	-.091	-.079
4	(Constant)	9.680	.527		18.365	.000	8.636	10.725			
	SCP_3	-.297	.088	-.346	-3.387	.001	-.470	-.123	-.471	-.305	-.27[illegible]
	SCP_4	-.152	.097	-.164	-1.568	.120	-.344	.040	-.398	-.147	-.128
	SCP_6	-7.225E-02	.089	-.077	-.816	.416	-.248	.103	-.294	-.077	-.067
5	(Constant)	9.490	.472		20.109	.000	8.555	10.425			
	SCP_3	-.311	.086	-.363	-3.636	.000	-.481	-.142	-.471	-.324	-.297
	SCP_4	-.176	.093	-.189	-1.899	.060	-.359	.008	-.398	-.176	-.155

Analysis for SP-Cost-All

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
COST	6.947	1.3008	116
SCP_1	4.927	1.4253	116
SCP_2	4.392	1.4277	116
SCP_3	4.819	1.5157	116
SCP_4	5.935	1.4027	116
SCP_5	5.060	1.3500	116
SCP_6	5.543	1.3809	116

Correlations

		COST	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	COST	1.000	-.373	-.367	-.471	-.398	-.223	-.294
	SCP_1	-.373	1.000	.570	.671	.662	.407	.468
	SCP_2	-.367	.570	1.000	.613	.659	.473	.423
	SCP_3	-.471	.671	.613	1.000	.574	.474	.412
	SCP_4	-.398	.662	.659	.574	1.000	.499	.458
	SCP_5	-.223	.407	.473	.474	.499	1.000	.420
	SCP_6	-.294	.468	.423	.412	.458	.420	1.000
Sig. (1-tailed)	COST	.	.000	.000	.000	.000	.008	.001
	SCP_1	.000	.	.000	.000	.000	.000	.000
	SCP_2	.000	.000	.	.000	.000	.000	.000
	SCP_3	.000	.000	.000	.	.000	.000	.000
	SCP_4	.000	.000	.000	.000	.	.000	.000
	SCP_5	.008	.000	.000	.000	.000	.	.000
	SCP_6	.001	.000	.000	.000	.000	.000	.
N	COST	116	116	116	116	116	116	116
	SCP_1	116	116	116	116	116	116	116
	SCP_2	116	116	116	116	116	116	116
	SCP_3	116	116	116	116	116	116	116
	SCP_4	116	116	116	116	116	116	116
	SCP_5	116	116	116	116	116	116	116
	SCP_6	116	116	116	116	116	116	116

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_3, SCP_5, SCP_4, SCP_2, SCP_1[a]	.	Enter
2	.	SCP_1	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_2	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: COST

Analysis for SP-Cost-All

Model	Entered	Removed	Method
1	SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4[a]	.	Enter
2	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_1	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP_2	Backward (criterion: Probability of F-to-remove >= .100).
6	.	SCP_3	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: COST

Model Summary[g]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.621[a]	.386	.283	1.2847	.386	3.764	6	36	.005
2	.621[b]	.385	.302	1.2674	.000	.011	1	38	.919
3	.617[c]	.381	.316	1.2547	-.004	.246	1	39	.623
4	.613[d]	.375	.327	1.2445	-.006	.369	1	40	.547
5	.606[e]	.368	.336	1.2363	-.008	.472	1	41	.496
6	.579[f]	.335	.319	1.2524	-.033	2.073	1	42	.158

a. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4

b. Predictors: (Constant), SCP_6, SCP_2, SCP_3, SCP_1, SCP_4

c. Predictors: (Constant), SCP_2, SCP_3, SCP_1, SCP_4

d. Predictors: (Constant), SCP_2, SCP_3, SCP_4

e. Predictors: (Constant), SCP_3, SCP_4

f. Predictors: (Constant), SCP_4

g. Dependent Variable: COST

Analysis for SP-Cost-Fin

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SCP_1	.420	2.380
	SCP_2	.470	2.127
	SCP_3	.451	2.215
	SCP_4	.418	2.394
	SCP_5	.658	1.519
	SCP_6	.698	1.434
2	(Constant)		
	SCP_2	.472	2.120
	SCP_3	.544	1.840
	SCP_4	.479	2.090
	SCP_5	.660	1.515
	SCP_6	.719	1.390
3	(Constant)		
	SCP_3	.610	1.640
	SCP_4	.572	1.748
	SCP_5	.669	1.495
	SCP_6	.725	1.379
4	(Constant)		
	SCP_3	.642	1.557
	SCP_4	.611	1.636
	SCP_6	.757	1.321
5	(Constant)		
	SCP_3	.670	1.492
	SCP_4	.670	1.492

a. Dependent Variable: COST

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
COST	6.744	1.5173	43
SCP_1	4.849	1.4123	43
SCP_2	4.419	1.5884	43
SCP_3	5.035	1.4573	43
SCP_4	5.884	1.3837	43
SCP_5	4.872	1.5004	43
SCP_6	5.302	1.4357	43

Correlations

		COST	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	COST	1.000	-.507	-.426	-.454	-.579	-.247	-.357
	SCP_1	-.507	1.000	.692	.633	.716	.302	.566
	SCP_2	-.426	.692	1.000	.662	.721	.465	.481
	SCP_3	-.454	.633	.662	1.000	.516	.429	.592
	SCP_4	-.579	.716	.721	.516	1.000	.388	.563
	SCP_5	-.247	.302	.465	.429	.388	1.000	.447
	SCP_6	-.357	.566	.481	.592	.563	.447	1.000
Sig. (1-tailed)	COST	.	.000	.002	.001	.000	.055	.009
	SCP_1	.000	.	.000	.000	.000	.024	.000
	SCP_2	.002	.000	.	.000	.000	.001	.001
	SCP_3	.001	.000	.000	.	.000	.002	.000
	SCP_4	.000	.000	.000	.000	.	.005	.000
	SCP_5	.055	.024	.001	.002	.005	.	.001
	SCP_6	.009	.000	.001	.000	.000	.001	.
N	COST	43	43	43	43	43	43	43
	SCP_1	43	43	43	43	43	43	43
	SCP_2	43	43	43	43	43	43	43
	SCP_3	43	43	43	43	43	43	43
	SCP_4	43	43	43	43	43	43	43
	SCP_5	43	43	43	43	43	43	43
	SCP_6	43	43	43	43	43	43	43

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SCP_1	.359	2.782
	SCP_2	.327	3.057
	SCP_3	.426	2.345
	SCP_4	.356	2.808
	SCP_5	.692	1.446
	SCP_6	.509	1.966
2	(Constant)		
	SCP_1	.371	2.692
	SCP_2	.346	2.886
	SCP_3	.432	2.314
	SCP_4	.357	2.799
	SCP_6	.542	1.843
3	(Constant)		
	SCP_1	.379	2.640
	SCP_2	.352	2.842
	SCP_3	.500	2.000
	SCP_4	.387	2.582
4	(Constant)		
	SCP_2	.365	2.740
	SCP_3	.559	1.790
	SCP_4	.477	2.096
5	(Constant)		
	SCP_3	.734	1.362
	SCP_4	.734	1.362
6	(Constant)		
	SCP_4	1.000	1.000

a. Dependent Variable: COST

Coefficient Correlations[a]

Model			SCP_6	SCP_5	SCP_2	SCP_3	SCP_1	SCP_4
1	Correlations	SCP_6	1.000	-.250	.176	-.325	-.177	-.255
		SCP_5	-.250	1.000	-.236	-.115	.180	-.057
		SCP_2	.176	-.236	1.000	-.367	-.237	-.428
		SCP_3	-.325	-.115	-.367	1.000	-.263	.178
		SCP_1	-.177	.180	-.237	-.263	1.000	-.378
		SCP_4	-.255	-.057	-.428	.178	-.378	1.000

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
COST	7.335	.8762	34
SCP_1	4.779	1.3495	34
SCP_2	4.603	1.2600	34
SCP_3	4.662	1.3184	34
SCP_4	5.838	1.4705	34
SCP_5	5.412	1.1446	34
SCP_6	5.412	1.2338	34

Correlations

		COST	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	COST	1.000	.007	-.368	-.208	-.146	-.101	-.218
	SCP_1	.007	1.000	.593	.659	.569	.531	.161
	SCP_2	-.368	.593	1.000	.633	.655	.506	.415
	SCP_3	-.208	.659	.633	1.000	.592	.421	.228
	SCP_4	-.146	.569	.655	.592	1.000	.468	.368
	SCP_5	-.101	.531	.506	.421	.468	1.000	.327
	SCP_6	-.218	.161	.415	.228	.368	.327	1.000
Sig. (1-tailed)	COST	.	.485	.016	.118	.205	.285	.107
	SCP_1	.485	.	.000	.000	.000	.001	.182
	SCP_2	.016	.000	.	.000	.000	.001	.007
	SCP_3	.118	.000	.000	.	.000	.007	.097
	SCP_4	.205	.000	.000	.000	.	.003	.016
	SCP_5	.285	.001	.001	.007	.003	.	.030
	SCP_6	.107	.182	.007	.097	.016	.030	.
N	COST	34	34	34	34	34	34	34
	SCP_1	34	34	34	34	34	34	34
	SCP_2	34	34	34	34	34	34	34
	SCP_3	34	34	34	34	34	34	34
	SCP_4	34	34	34	34	34	34	34
	SCP_5	34	34	34	34	34	34	34

ANOVA[g]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.273	6	6.212	3.764	.005[a]
	Residual	59.414	36	1.650		
	Total	96.686	42			
2	Regression	37.255	5	7.451	4.639	.002[b]
	Residual	59.431	37	1.606		
	Total	96.686	42			
3	Regression	36.860	4	9.215	5.853	.001[c]
	Residual	59.826	38	1.574		
	Total	96.686	42			
4	Regression	36.279	3	12.093	7.807	.000[d]
	Residual	60.407	39	1.549		
	Total	96.686	42			
5	Regression	35.548	2	17.774	11.629	.000[e]
	Residual	61.138	40	1.528		
	Total	96.686	42			
6	Regression	32.380	1	32.380	20.645	.000[f]
	Residual	64.306	41	1.568		
	Total	96.686	42			

a. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4
b. Predictors: (Constant), SCP_6, SCP_2, SCP_3, SCP_1, SCP_4
c. Predictors: (Constant), SCP_2, SCP_3, SCP_1, SCP_4
d. Predictors: (Constant), SCP_2, SCP_3, SCP_4
e. Predictors: (Constant), SCP_3, SCP_4
f. Predictors: (Constant), SCP_4
g. Dependent Variable: COST

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	11.013	1.010		10.909	.000	8.966	13.060			
	SCP_1	-.155	.234	-.145	-.663	.511	-.630	.320	-.507	-.110	-.087
	SCP_2	.179	.218	.188	.822	.417	-.263	.622	-.426	.136	.107
	SCP_3	-.277	.208	-.266	-1.330	.192	-.699	.146	-.454	-.216	-.174
	SCP_4	-.569	.240	-.519	-2.369	.023	-1.056	-.082	-.579	-.367	-.310
	SCP_5	-1.636E-02	.159	-.016	-.103	.919	-.339	.306	-.247	-.017	-.013
	SCP_6	9.670E-02	.194	.091	.499	.620	-.296	.489	-.357	.083	.065
2	(Constant)	10.983	.953		11.523	.000	9.052	12.914			
	SCP_1	-.151	.227	-.140	-.664	.511	-.611	.309	-.507	-.109	-.086
	SCP_2	.174	.209	.182	.832	.411	-.250	.598	-.426	.135	.107
	SCP_3	-.279	.204	-.268	-1.369	.179	-.693	.134	-.454	-.220	-.176
	SCP_4	-.570	.236	-.520	-2.412	.021	-1.049	-.091	-.579	-.369	-.31[illegible]
	SCP_6	9.172E-02	.185	.087	.496	.623	-.283	.466	-.357	.081	.06[illegible]
3	(Constant)	11.071	.927		11.940	.000	9.194	12.948			
	SCP_1	-.135	.223	-.126	-.608	.547	-.586	.316	-.507	-.098	-.078
	SCP_2	.161	.205	.169	.784	.438	-.255	.577	-.426	.126	.10[illegible]
	SCP_3	-.242	.188	-.233	-1.289	.205	-.623	.138	-.454	-.205	-.16[illegible]
	SCP_4	-.538	.225	-.490	-2.391	.022	-.993	-.082	-.579	-.362	-.305
4	(Constant)	11.054	.919		12.025	.000	9.194	12.913			
	SCP_2	.137	.200	.144	.687	.496	-.267	.542	-.426	.109	.08[illegible]
	SCP_3	-.279	.176	-.268	-1.583	.121	-.636	.077	-.454	-.246	-.20[illegible]
	SCP_4	-.597	.201	-.544	-2.970	.005	-1.003	-.190	-.579	-.429	-.376
5	(Constant)	10.882	.879		12.382	.000	9.106	12.659			
	SCP_3	-.220	.153	-.211	-1.440	.158	-.529	.089	-.454	-.222	-.181
	SCP_4	-.515	.161	-.470	-3.201	.003	-.840	-.190	-.579	-.452	-.402
6	(Constant)	10.478	.844		12.420	.000	8.774	12.181			
	SCP_4	-.635	.140	-.579	-4.544	.000	-.917	-.353	-.579	-.579	-.579

Analysis for SP-Cost-Fin

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	8.223	.876		9.382	.000	6.425	10.021			
	SCP_1	.249	.165	.384	1.514	.142	-.089	.587	.007	.280	.255
	SCP_2	-.371	.182	-.534	-2.038	.051	-.745	.002	-.368	-.365	-.344
	SCP_3	-.118	.166	-.178	-.713	.482	-.459	.222	-.208	-.136	-.120
	SCP_4	6.506E-02	.145	.109	.448	.658	-.233	.363	-.146	.086	.076
	SCP_5	6.683E-03	.163	.009	.041	.968	-.327	.340	-.101	.008	.007
	SCP_6	-4.316E-02	.137	-.061	-.315	.755	-.325	.238	-.218	-.060	-.053
2	(Constant)	8.237	.797		10.331	.000	6.603	9.870			
	SCP_1	.251	.154	.387	1.630	.114	-.065	.567	.007	.294	.270
	SCP_2	-.370	.177	-.533	-2.090	.046	-.734	-.007	-.368	-.367	-.346
	SCP_3	-.118	.163	-.178	-.727	.473	-.452	.215	-.208	-.136	-.120
	SCP_4	6.561E-02	.142	.110	.462	.648	-.225	.356	-.146	.087	.076
	SCP_6	-4.213E-02	.132	-.059	-.319	.753	-.313	.229	-.218	-.060	-.053
3	(Constant)	8.091	.643		12.575	.000	6.775	9.407			
	SCP_1	.258	.150	.398	1.718	.096	-.049	.566	.007	.304	.28[illegible]
	SCP_2	-.387	.167	-.556	-2.314	.028	-.728	-.045	-.368	-.395	-.377
	SCP_3	-.117	.160	-.176	-.728	.472	-.445	.211	-.208	-.134	-.119
	SCP_4	5.721E-02	.137	.096	.417	.680	-.224	.338	-.146	.077	.068
4	(Constant)	8.181	.598		13.678	.000	6.959	9.402			
	SCP_1	.270	.146	.416	1.854	.074	-.027	.567	.007	.321	.298
	SCP_2	-.359	.151	-.516	-2.373	.024	-.668	-.050	-.368	-.397	-.38[illegible]
	SCP_3	-.104	.155	-.156	-.669	.509	-.420	.213	-.208	-.121	-.107
5	(Constant)	8.096	.579		13.977	.000	6.915	9.277			
	SCP_1	.226	.128	.347	1.757	.089	-.036	.487	.007	.301	.280
	SCP_2	-.399	.138	-.574	-2.905	.007	-.680	-.119	-.368	-.463	-.463

Coefficients[a]

Model		Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)		
	SCP_1	.442	2.263
	SCP_2	.414	2.417
	SCP_3	.456	2.194
	SCP_4	.478	2.090
	SCP_5	.630	1.588
	SCP_6	.762	1.312
2	(Constant)		
	SCP_1	.486	2.058
	SCP_2	.422	2.372
	SCP_3	.456	2.193
	SCP_4	.483	2.072
	SCP_6	.788	1.269
3	(Constant)		
	SCP_1	.496	2.017
	SCP_2	.460	2.176
	SCP_3	.457	2.191
	SCP_4	.500	2.001
4	(Constant)		
	SCP_1	.514	1.947
	SCP_2	.545	1.835
	SCP_3	.475	2.105
5	(Constant)		
	SCP_1	.648	1.542
	SCP_2	.648	1.542

a. Dependent Variable: COST

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2[a]	.	Enter
2	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP_3	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: COST

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	Change Statistics F Change	Change Statistics df1	Change Statistics df2	Change Statistics Sig. F Change
1	.483[a]	.233	.063	.8484	.233	1.367	6	27	.264
2	.483[b]	.233	.096	.8332	.000	.002	1	29	.968
3	.480[c]	.230	.124	.8201	-.003	.101	1	30	.753
4	.475[d]	.226	.148	.8088	-.005	.174	1	31	.680
5	.463[e]	.214	.163	.8015	-.012	.447	1	32	.509

a. Predictors: (Constant), SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2

b. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3, SCP_2

c. Predictors: (Constant), SCP_1, SCP_4, SCP_3, SCP_2

d. Predictors: (Constant), SCP_1, SCP_3, SCP_2

e. Predictors: (Constant), SCP_1, SCP_2

f. Dependent Variable: COST

ANOVA[f]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.903	6	.984	1.367	.264[a]
	Residual	19.435	27	.720		
	Total	25.338	33			
2	Regression	5.901	5	1.180	1.700	.167[b]
	Residual	19.436	28	.694		
	Total	25.338	33			
3	Regression	5.831	4	1.458	2.167	.098[c]
	Residual	19.507	29	.673		
	Total	25.338	33			
4	Regression	5.714	3	1.905	2.912	.051[d]
	Residual	19.623	30	.654		
	Total	25.338	33			
5	Regression	5.422	2	2.711	4.220	.024[e]
	Residual	19.915	31	.642		
	Total	25.338	33			

a. Predictors: (Constant), SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2

b. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3, SCP_2

c. Predictors: (Constant), SCP_1, SCP_4, SCP_3, SCP_2

d. Predictors: (Constant), SCP_1, SCP_3, SCP_2

e. Predictors: (Constant), SCP_1, SCP_2

f. Dependent Variable: COST

Analysis for SP-Cost-Str

Model Summary[g]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.630[a]	.397	.288	1.102023	.397	3.625	6	33	.007
2	.630[b]	.397	.309	1.085696	.000	.000	1	35	.994
3	.630[c]	.397	.328	1.070167	.000	.006	1	36	.939
4	.629[d]	.395	.345	1.056900	-.002	.113	1	37	.739
5	.628[e]	.394	.361	1.043458	-.001	.065	1	38	.800
6	.623[f]	.389	.373	1.034247	-.005	.332	1	39	.568

a. Predictors: (Constant), SCP6, SCP3, SCP2, SCP5, SCP1, SCP4
b. Predictors: (Constant), SCP6, SCP3, SCP2, SCP1, SCP4
c. Predictors: (Constant), SCP6, SCP3, SCP1, SCP4
d. Predictors: (Constant), SCP3, SCP1, SCP4
e. Predictors: (Constant), SCP3, SCP4
f. Predictors: (Constant), SCP3
g. Dependent Variable: COST

ANOVA[g]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.417	6	4.403	3.625	.007[a]
	Residual	40.077	33	1.214		
	Total	66.494	39			
2	Regression	26.417	5	5.283	4.482	.003[b]
	Residual	40.077	34	1.179		
	Total	66.494	39			
3	Regression	26.410	4	6.602	5.765	.001[c]
	Residual	40.084	35	1.145		
	Total	66.494	39			
4	Regression	26.280	3	8.760	7.842	.000[d]
	Residual	40.213	36	1.117		
	Total	66.494	39			
5	Regression	26.208	2	13.104	12.035	.000[e]
	Residual	40.286	37	1.089		
	Total	66.494	39			
6	Regression	25.846	1	25.846	24.163	.000[f]
	Residual	40.647	38	1.070		
	Total	66.494	39			

a. Predictors: (Constant), SCP6, SCP3, SCP2, SCP5, SCP1, SCP4
b. Predictors: (Constant), SCP6, SCP3, SCP2, SCP1, SCP4
c. Predictors: (Constant), SCP6, SCP3, SCP1, SCP4
d. Predictors: (Constant), SCP3, SCP1, SCP4
e. Predictors: (Constant), SCP3, SCP4
f. Predictors: (Constant), SCP3
g. Dependent Variable: COST

Analysis for SP-Cost-BS

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
COST	6.86250	1.305744	40
SCP1	5.13750	1.493522	40
SCP2	4.21250	1.381598	40
SCP3	4.68750	1.723471	40
SCP4	6.11250	1.389002	40
SCP5	4.97500	1.300641	40
SCP6	5.93750	1.378347	40

Correlations

		COST	SCP1	SCP2	SCP3	SCP4	SCP5	SCP6
Pearson Correlation	COST	1.000	-.421	-.339	-.623	-.327	-.364	-.261
	SCP1	-.421	1.000	.467	.739	.669	.500	.549
	SCP2	-.339	.467	1.000	.559	.652	.453	.451
	SCP3	-.623	.739	.559	1.000	.618	.614	.402
	SCP4	-.327	.669	.652	.618	1.000	.722	.412
	SCP5	-.364	.500	.453	.614	.722	1.000	.510
	SCP6	-.261	.549	.451	.402	.412	.510	1.000
Sig. (1-tailed)	COST	.	.003	.016	.000	.020	.010	.052
	SCP1	.003	.	.001	.000	.000	.001	.000
	SCP2	.016	.001	.	.000	.000	.002	.002
	SCP3	.000	.000	.000	.	.000	.000	.005
	SCP4	.020	.000	.000	.000	.	.000	.004
	SCP5	.010	.001	.002	.000	.000	.	.000
	SCP6	.052	.000	.002	.005	.004	.000	.
N	COST	40	40	40	40	40	40	40
	SCP1	40	40	40	40	40	40	40
	SCP2	40	40	40	40	40	40	40
	SCP3	40	40	40	40	40	40	40
	SCP4	40	40	40	40	40	40	40
	SCP5	40	40	40	40	40	40	40
	SCP6	40	40	40	40	40	40	40

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP6, SCP3, SCP2, SCP5, SCP1, SCP4[a]	.	Enter
2	.	SCP5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP2	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP6	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP1	Backward (criterion: Probability of F-to-remove >= .100).
6	.	SCP4	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: COST

Analysis for SP-Cost-BS

Analysis for SP-Cost-BS

SPSS regression printouts for quality performance analysis

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.636[a]	.405	.372	1.0050	.405	12.233	6	108	.000
2	.636[b]	.405	.377	1.0004	.000	.001	1	110	.978
3	.636[c]	.404	.382	.9963	.000	.087	1	111	.769
4	.631[d]	.399	.382	.9964	-.006	1.025	1	112	.313
5	.620[e]	.384	.373	1.0040	-.015	2.721	1	113	.102

a. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_2, SCP_1, SCP_4

b. Predictors: (Constant), SCP_3, SCP_5, SCP_2, SCP_1, SCP_4

c. Predictors: (Constant), SCP_3, SCP_2, SCP_1, SCP_4

d. Predictors: (Constant), SCP_3, SCP_2, SCP_1

e. Predictors: (Constant), SCP_3, SCP_1

f. Dependent Variable: QUALITY

ANOVA[f]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74.139	6	12.356	12.233	.000[a]
	Residual	109.092	108	1.010		
	Total	183.230	114			
2	Regression	74.138	5	14.828	14.815	.000[b]
	Residual	109.092	109	1.001		
	Total	183.230	114			
3	Regression	74.051	4	18.513	18.652	.000[c]
	Residual	109.179	110	.993		
	Total	183.230	114			
4	Regression	73.034	3	24.345	24.522	.000[d]
	Residual	110.197	111	.993		
	Total	183.230	114			
5	Regression	70.332	2	35.166	34.887	.000[e]
	Residual	112.898	112	1.008		
	Total	183.230	114			

a. Predictors: (Constant), SCP_6, SCP_3, SCP_5, SCP_2, SCP_1, SCP_4

b. Predictors: (Constant), SCP_3, SCP_5, SCP_2, SCP_1, SCP_4

c. Predictors: (Constant), SCP_3, SCP_2, SCP_1, SCP_4

d. Predictors: (Constant), SCP_3, SCP_2, SCP_1

e. Predictors: (Constant), SCP_3, SCP_1

f. Dependent Variable: QUALITY

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	10.364	.485		21.792	.000	9.603	11.525			
	SCP_1	-.160	.101	-.179	-1.579	.117	-.361	.041	-.539	-.150	-.117
	SCP_2	-9.583E-02	.096	-.107	-1.000	.319	-.286	.094	-.485	-.096	-.074
	SCP_3	-.283	.091	-.334	-3.093	.003	-.464	-.102	-.586	-.285	-.230
	SCP_4	-9.360E-02	.103	-.104	-.909	.366	-.298	.111	-.491	-.087	-.067
	SCP_5	-2.423E-02	.086	-.026	-.282	.779	-.195	.146	-.353	-.027	-.021
	SCP_6	-2.256E-03	.081	-.002	-.028	.978	-.163	.159	-.316	-.003	-.002
2	(Constant)	10.559	.450		23.456	.000	9.667	11.451			
	SCP_1	-.161	.099	-.180	-1.616	.109	-.358	.036	-.539	-.153	-.119
	SCP_2	-9.603E-02	.095	-.107	-1.010	.315	-.284	.092	-.485	-.096	-.075
	SCP_3	-.283	.091	-.334	-3.108	.002	-.463	-.102	-.586	-.285	-.23[illegible]
	SCP_4	-9.390E-02	.102	-.104	-.921	.359	-.296	.108	-.491	-.088	-.06[illegible]
	SCP_5	-2.471E-02	.084	-.026	-.294	.769	-.191	.142	-.353	-.028	-.02[illegible]
3	(Constant)	10.511	.418		25.147	.000	9.683	11.339			
	SCP_1	-.160	.099	-.179	-1.617	.109	-.356	.036	-.539	-.152	-.11[illegible]
	SCP_2	-9.981E-02	.094	-.112	-1.064	.290	-.286	.086	-.485	-.101	-.07[illegible]
	SCP_3	-.288	.089	-.340	-3.234	.002	-.464	-.111	-.586	-.295	-.23[illegible]
	SCP_4	-.100	.099	-.112	-1.013	.313	-.297	.096	-.491	-.096	-.07[illegible]
4	(Constant)	10.310	.368		28.022	.000	9.581	11.039			
	SCP_1	-.199	.091	-.223	-2.181	.031	-.380	-.018	-.539	-.203	-.16[illegible]
	SCP_2	-.140	.085	-.157	-1.649	.102	-.308	.028	-.485	-.155	-.12[illegible]
	SCP_3	-.294	.089	-.346	-3.304	.001	-.470	-.117	-.586	-.299	-.243
5	(Constant)	10.151	.358		28.373	.000	9.442	10.860			
	SCP_1	-.241	.088	-.270	-2.729	.007	-.416	-.066	-.539	-.250	-.202
	SCP_3	-.345	.084	-.405	-4.127	.000	-.511	-.180	-.586	-.363	-.306

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
QUALITY	7.313	1.2678	115
SCP_1	4.913	1.4177	115
SCP_2	4.383	1.4163	115
SCP_3	4.787	1.4957	115
SCP_4	5.935	1.4088	115
SCP_5	5.039	1.3412	115
SCP_6	5.535	1.3776	115

Correlations

		QUALITY	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	QUALITY	1.000	-.539	-.485	-.586	-.491	-.353	-.316
	SCP_1	-.539	1.000	.558	.660	.655	.399	.457
	SCP_2	-.485	.558	1.000	.590	.657	.464	.412
	SCP_3	-.586	.660	.590	1.000	.555	.461	.390
	SCP_4	-.491	.655	.657	.555	1.000	.493	.454
	SCP_5	-.353	.399	.464	.461	.493	1.000	.411
	SCP_6	-.316	.457	.412	.390	.454	.411	1.000
Sig. (1-tailed)	QUALITY	.	.000	.000	.000	.000	.000	.000
	SCP_1	.000	.	.000	.000	.000	.000	.000
	SCP_2	.000	.000	.	.000	.000	.000	.000
	SCP_3	.000	.000	.000	.	.000	.000	.000
	SCP_4	.000	.000	.000	.000	.	.000	.000
	SCP_5	.000	.000	.000	.000	.000	.	.000
	SCP_6	.000	.000	.000	.000	.000	.000	.
N	QUALITY	115	115	115	115	115	115	115
	SCP_1	115	115	115	115	115	115	115
	SCP_2	115	115	115	115	115	115	115
	SCP_3	115	115	115	115	115	115	115
	SCP_4	115	115	115	115	115	115	115
	SCP_5	115	115	115	115	115	115	115
	SCP_6	115	115	115	115	115	115	115

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_3, SCP_5, SCP_2, SCP_1, SCP_4[a]	.	Enter
2	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP_2	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: QUALITY

Analysis for SP-Quality-All

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4[a]	.	Enter
2	.	SCP_3	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_6	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_1	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: QUALITY

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.671[a]	.450	.358	1.0493	.450	4.910	6	36	.001
2	.670[b]	.450	.375	1.0355	-.001	.033	1	38	.856
3	.669[c]	.447	.389	1.0242	-.003	.173	1	39	.680
4	.658[d]	.434	.390	1.0231	-.013	.917	1	40	.344
5	.649[e]	.421	.392	1.0216	-.013	.884	1	41	.353

a. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4

b. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_1, SCP_4

c. Predictors: (Constant), SCP_5, SCP_2, SCP_1, SCP_4

d. Predictors: (Constant), SCP_5, SCP_2, SCP_4

e. Predictors: (Constant), SCP_2, SCP_4

f. Dependent Variable: QUALITY

ANOVA[f]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.434	6	5.406	4.910	.001[a]
	Residual	39.636	36	1.101		
	Total	72.070	42			
2	Regression	32.397	5	6.479	6.043	.000[b]
	Residual	39.673	37	1.072		
	Total	72.070	42			
3	Regression	32.211	4	8.053	7.677	.000[c]
	Residual	39.858	38	1.049		
	Total	72.070	42			
4	Regression	31.249	3	10.416	9.952	.000[d]
	Residual	40.821	39	1.047		
	Total	72.070	42			
5	Regression	30.324	2	15.162	14.528	.000[e]
	Residual	41.746	40	1.044		
	Total	72.070	42			

a. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_3, SCP_1, SCP_4

b. Predictors: (Constant), SCP_6, SCP_5, SCP_2, SCP_1, SCP_4

c. Predictors: (Constant), SCP_5, SCP_2, SCP_1, SCP_4

d. Predictors: (Constant), SCP_5, SCP_2, SCP_4

e. Predictors: (Constant), SCP_2, SCP_4

f. Dependent Variable: QUALITY

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SCP_1	.428	2.334
	SCP_2	.481	2.077
	SCP_3	.474	2.111
	SCP_4	.421	2.377
	SCP_5	.666	1.501
	SCP_6	.707	1.415
2	(Constant)		
	SCP_1	.442	2.264
	SCP_2	.484	2.065
	SCP_3	.474	2.111
	SCP_4	.426	2.350
	SCP_5	.693	1.443
3	(Constant)		
	SCP_1	.442	2.263
	SCP_2	.493	2.027
	SCP_3	.491	2.036
	SCP_4	.446	2.240
4	(Constant)		
	SCP_1	.520	1.923
	SCP_2	.602	1.662
	SCP_3	.493	2.028
5	(Constant)		
	SCP_1	.564	1.773
	SCP_3	.564	1.773

a. Dependent Variable: QUALITY

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
QUALITY	7.302	1.3099	43
SCP_1	4.849	1.4123	43
SCP_2	4.419	1.5884	43
SCP_3	5.035	1.4573	43
SCP_4	5.884	1.3837	43
SCP_5	4.872	1.5004	43
SCP_6	5.302	1.4357	43

Correlations

		QUALITY	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	QUALITY	1.000	-.560	-.612	-.458	-.591	-.401	-.452
	SCP_1	-.560	1.000	.692	.633	.716	.302	.566
	SCP_2	-.612	.692	1.000	.662	.721	.465	.481
	SCP_3	-.458	.633	.662	1.000	.516	.429	.592
	SCP_4	-.591	.716	.721	.516	1.000	.388	.563
	SCP_5	-.401	.302	.465	.429	.388	1.000	.447
	SCP_6	-.452	.566	.481	.592	.563	.447	1.000
Sig. (1-tailed)	QUALITY	.	.000	.000	.001	.000	.004	.001
	SCP_1	.000	.	.000	.000	.000	.024	.000
	SCP_2	.000	.000	.	.000	.000	.001	.001
	SCP_3	.001	.000	.000	.	.000	.002	.000
	SCP_4	.000	.000	.000	.000	.	.005	.000
	SCP_5	.004	.024	.001	.002	.005	.	.001
	SCP_6	.001	.000	.001	.000	.000	.001	.
N	QUALITY	43	43	43	43	43	43	43
	SCP_1	43	43	43	43	43	43	43
	SCP_2	43	43	43	43	43	43	43
	SCP_3	43	43	43	43	43	43	43
	SCP_4	43	43	43	43	43	43	43
	SCP_5	43	43	43	43	43	43	43
	SCP_6	43	43	43	43	43	43	43

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
QUALITY	7.353	1.1840	34
SCP_1	4.779	1.3495	34
SCP_2	4.603	1.2600	34
SCP_3	4.662	1.3184	34
SCP_4	5.838	1.4705	34
SCP_5	5.412	1.1446	34
SCP_6	5.412	1.2338	34

Correlations

		QUALITY	SCP_1	SCP_2	SCP_3	SCP_4	SCP_5	SCP_6
Pearson Correlation	QUALITY	1.000	-.590	-.609	-.722	-.593	-.424	-.372
	SCP_1	-.590	1.000	.593	.659	.569	.531	.161
	SCP_2	-.609	.593	1.000	.633	.655	.506	.415
	SCP_3	-.722	.659	.633	1.000	.592	.421	.228
	SCP_4	-.593	.569	.655	.592	1.000	.468	.368
	SCP_5	-.424	.531	.506	.421	.468	1.000	.327
	SCP_6	-.372	.161	.415	.228	.368	.327	1.000
Sig. (1-tailed)	QUALITY	.	.000	.000	.000	.000	.006	.015
	SCP_1	.000	.	.000	.000	.000	.001	.182
	SCP_2	.000	.000	.	.000	.000	.001	.007
	SCP_3	.000	.000	.000	.	.000	.007	.097
	SCP_4	.000	.000	.000	.000	.	.003	.016
	SCP_5	.006	.001	.001	.007	.003	.	.030
	SCP_6	.015	.182	.007	.097	.016	.030	.
N	QUALITY	34	34	34	34	34	34	34
	SCP_1	34	34	34	34	34	34	34
	SCP_2	34	34	34	34	34	34	34
	SCP_3	34	34	34	34	34	34	34
	SCP_4	34	34	34	34	34	34	34
	SCP_5	34	34	34	34	34	34	34
	SCP_6	34	34	34	34	34	34	34

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2[a]	.	Enter
2	.	SCP_5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP_2	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP_1	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP_4	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: QUALITY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	10.902	.825		13.222	.000	9.230	12.575			
	SCP_1	-.153	.191	-.165	-.798	.430	-.540	.235	-.560	-.132	-.099
	SCP_2	-.237	.178	-.287	-1.330	.192	-.598	.125	-.612	-.216	-.164
	SCP_3	3.106E-02	.170	.035	.183	.856	-.314	.376	-.458	.030	.023
	SCP_4	-.182	.196	-.192	-.928	.360	-.580	.216	-.591	-.153	-.115
	SCP_5	-.107	.130	-.123	-.827	.413	-.370	.156	-.401	-.137	-.102
	SCP_6	-7.081E-02	.158	-.078	-.448	.657	-.392	.250	-.452	-.074	-.055
2	(Constant)	10.936	.793		13.784	.000	9.328	12.543			
	SCP_1	-.143	.182	-.155	-.788	.436	-.512	.225	-.560	-.128	-.096
	SCP_2	-.225	.164	-.273	-1.375	.177	-.557	.107	-.612	-.221	-.168
	SCP_4	-.188	.190	-.199	-.989	.329	-.574	.198	-.591	-.160	-.121
	SCP_5	-.105	.127	-.120	-.823	.416	-.362	.153	-.401	-.134	-.100
	SCP_6	-6.142E-02	.148	-.067	-.416	.680	-.360	.238	-.452	-.068	-.051
3	(Constant)	10.874	.771		14.106	.000	9.313	12.435			
	SCP_1	-.165	.173	-.178	-.958	.344	-.514	.184	-.560	-.154	-.116
	SCP_2	-.221	.161	-.268	-1.366	.180	-.548	.106	-.612	-.216	-.165
	SCP_4	-.205	.184	-.217	-1.115	.272	-.578	.167	-.591	-.178	-.134
	SCP_5	-.121	.120	-.138	-1.009	.320	-.363	.122	-.401	-.161	-.122
4	(Constant)	10.736	.757		14.191	.000	9.206	12.267			
	SCP_2	-.278	.150	-.337	-1.852	.072	-.581	.026	-.612	-.284	-.223
	SCP_4	-.282	.165	-.298	-1.707	.096	-.617	.052	-.591	-.264	-.206
	SCP_5	-.112	.119	-.128	-.940	.353	-.353	.129	-.401	-.149	-.113
5	(Constant)	10.449	.691		15.118	.000	9.052	11.846			
	SCP_2	-.319	.143	-.386	-2.223	.032	-.608	-.029	-.612	-.332	-.267
	SCP_4	-.296	.164	-.312	-1.797	.080	-.628	.037	-.591	-.273	-.216

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SCP_1	.359	2.782
	SCP_2	.327	3.057
	SCP_3	.426	2.345
	SCP_4	.356	2.808
	SCP_5	.692	1.446
	SCP_6	.509	1.966
2	(Constant)		
	SCP_1	.386	2.590
	SCP_2	.378	2.646
	SCP_4	.368	2.720
	SCP_5	.701	1.426
	SCP_6	.569	1.758
3	(Constant)		
	SCP_1	.421	2.377
	SCP_2	.380	2.635
	SCP_4	.385	2.597
	SCP_5	.773	1.293
4	(Constant)		
	SCP_2	.439	2.276
	SCP_4	.476	2.101
	SCP_5	.778	1.286
5	(Constant)		
	SCP_2	.480	2.085
	SCP_4	.480	2.085

a. Dependent Variable: QUALITY

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	SCP_1	.442	2.263
	SCP_2	.414	2.417
	SCP_3	.456	2.194
	SCP_4	.478	2.090
	SCP_5	.630	1.588
	SCP_6	.762	1.312
2	(Constant)		
	SCP_1	.486	2.058
	SCP_2	.422	2.372
	SCP_3	.456	2.193
	SCP_4	.483	2.072
	SCP_6	.788	1.269
3	(Constant)		
	SCP_1	.513	1.951
	SCP_3	.494	2.023
	SCP_4	.537	1.862
	SCP_6	.859	1.164
4	(Constant)		
	SCP_3	.649	1.540
	SCP_4	.592	1.689
	SCP_6	.865	1.157
5	(Constant)		
	SCP_3	.948	1.055
	SCP_6	.948	1.055

a. Dependent Variable: QUALITY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.777[a]	.603	.515	.8244	.603	6.845	6	27	.000
2	.777[b]	.603	.533	.8096	.000	.000	1	29	.993
3	.775[c]	.600	.545	.7984	-.003	.207	1	30	.653
4	.767[d]	.589	.548	.7964	-.012	.851	1	31	.364
5	.753[e]	.567	.539	.8042	-.022	1.608	1	32	.215

a. Predictors: (Constant), SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2

b. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3, SCP_2

c. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3

d. Predictors: (Constant), SCP_6, SCP_4, SCP_3

e. Predictors: (Constant), SCP_6, SCP_3

f. Dependent Variable: QUALITY

ANOVA[f]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.914	6	4.652	6.845	.000[a]
	Residual	18.350	27	.680		
	Total	46.265	33			
2	Regression	27.914	5	5.583	8.519	.000[b]
	Residual	18.350	28	.655		
	Total	46.265	33			
3	Regression	27.779	4	6.945	10.895	.000[c]
	Residual	18.486	29	.637		
	Total	46.265	33			
4	Regression	27.237	3	9.079	14.314	.000[d]
	Residual	19.028	30	.634		
	Total	46.265	33			
5	Regression	26.217	2	13.109	20.270	.000[e]
	Residual	20.048	31	.647		
	Total	46.265	33			

a. Predictors: (Constant), SCP_6, SCP_1, SCP_5, SCP_4, SCP_3, SCP_2

b. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3, SCP_2

c. Predictors: (Constant), SCP_6, SCP_1, SCP_4, SCP_3

d. Predictors: (Constant), SCP_6, SCP_4, SCP_3

e. Predictors: (Constant), SCP_6, SCP_3

f. Dependent Variable: QUALITY

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
QUALITY	7.26250	1.295888	40
SCP1	5.13750	1.493522	40
SCP2	4.21250	1.381598	40
SCP3	4.68750	1.723471	40
SCP4	6.11250	1.389002	40
SCP5	4.97500	1.300641	40
SCP6	5.93750	1.378347	40

Correlations

		QUALITY	SCP1	SCP2	SCP3	SCP4	SCP5	SCP6
Pearson Correlation	QUALITY	1.000	-.486	-.265	-.631	-.309	-.289	-.145
	SCP1	-.486	1.000	.467	.739	.669	.500	.549
	SCP2	-.265	.467	1.000	.559	.652	.453	.451
	SCP3	-.631	.739	.559	1.000	.618	.614	.402
	SCP4	-.309	.669	.652	.618	1.000	.722	.412
	SCP5	-.289	.500	.453	.614	.722	1.000	.510
	SCP6	-.145	.549	.451	.402	.412	.510	1.000
Sig. (1-tailed)	QUALITY	.	.001	.049	.000	.026	.035	.186
	SCP1	.001	.	.001	.000	.000	.001	.000
	SCP2	.049	.001	.	.000	.000	.002	.002
	SCP3	.000	.000	.000	.	.000	.000	.005
	SCP4	.026	.000	.000	.000	.	.000	.004
	SCP5	.035	.001	.002	.000	.000	.	.000
	SCP6	.186	.000	.002	.005	.004	.000	.
N	QUALITY	40	40	40	40	40	40	40
	SCP1	40	40	40	40	40	40	40
	SCP2	40	40	40	40	40	40	40
	SCP3	40	40	40	40	40	40	40
	SCP4	40	40	40	40	40	40	40
	SCP5	40	40	40	40	40	40	40
	SCP6	40	40	40	40	40	40	40

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	11.676	.852		13.710	.000	9.928	13.423			
	SCP_1	-.117	.160	-.133	-.729	.472	-.445	.212	-.590	-.139	-.088
	SCP_2	-7.808E-02	.177	-.083	-.441	.663	-.441	.285	-.609	-.085	-.053
	SCP_3	-.423	.161	-.471	-2.624	.014	-.754	-.092	-.722	-.451	-.318
	SCP_4	-9.898E-02	.141	-.123	-.702	.489	-.388	.191	-.593	-.134	-.085
	SCP_5	-1.433E-03	.158	-.001	-.009	.993	-.326	.323	-.424	-.002	-.001
	SCP_6	-.157	.133	-.163	-1.175	.250	-.430	.117	-.372	-.221	-.142
2	(Constant)	11.673	.775		15.068	.000	10.086	13.260			
	SCP_1	-.117	.150	-.133	-.782	.441	-.424	.190	-.590	-.146	-.093
	SCP_2	-7.830E-02	.172	-.083	-.455	.653	-.431	.275	-.609	-.086	-.054
	SCP_3	-.423	.158	-.471	-2.673	.012	-.747	-.099	-.722	-.451	-.318
	SCP_4	-9.910E-02	.138	-.123	-.718	.479	-.382	.184	-.593	-.135	-.085
	SCP_6	-.157	.129	-.163	-1.219	.233	-.420	.107	-.372	-.224	-.145
3	(Constant)	11.688	.763		15.313	.000	10.127	13.249			
	SCP_1	-.133	.144	-.151	-.922	.364	-.427	.162	-.590	-.169	-.108
	SCP_3	-.443	.150	-.493	-2.956	.006	-.750	-.136	-.722	-.481	-.347
	SCP_4	-.119	.129	-.148	-.924	.363	-.383	.145	-.593	-.169	-.108
	SCP_6	-.174	.122	-.181	-1.429	.164	-.422	.075	-.372	-.256	-.168
4	(Constant)	11.532	.742		15.533	.000	10.016	13.048			
	SCP_3	-.511	.131	-.569	-3.912	.000	-.777	-.244	-.722	-.581	-.458
	SCP_4	-.155	.123	-.193	-1.268	.215	-.406	.095	-.593	-.226	-.148
	SCP_6	-.165	.121	-.172	-1.363	.183	-.411	.082	-.372	-.241	-.160
5	(Constant)	11.304	.727		15.542	.000	9.820	12.787			
	SCP_3	-.604	.109	-.672	-5.535	.000	-.826	-.381	-.722	-.705	-.654
	SCP_6	-.210	.117	-.219	-1.803	.081	-.448	.028	-.372	-.308	-.213

ANOVA[g]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.405	6	4.734	4.212	.003[a]
	Residual	37.089	33	1.124		
	Total	65.494	39			
2	Regression	28.361	5	5.672	5.194	.001[b]
	Residual	37.133	34	1.092		
	Total	65.494	39			
3	Regression	28.335	4	7.084	6.672	.000[c]
	Residual	37.159	35	1.062		
	Total	65.494	39			
4	Regression	27.478	3	9.159	8.674	.000[d]
	Residual	38.016	36	1.056		
	Total	65.494	39			
5	Regression	27.005	2	13.502	12.980	.000[e]
	Residual	38.489	37	1.040		
	Total	65.494	39			
6	Regression	26.083	1	26.083	25.149	.000[f]
	Residual	39.411	38	1.037		
	Total	65.494	39			

a. Predictors: (Constant), SCP6, SCP3, SCP2, SCP5, SCP1, SCP4

b. Predictors: (Constant), SCP6, SCP3, SCP2, SCP1, SCP4

c. Predictors: (Constant), SCP6, SCP3, SCP1, SCP4

d. Predictors: (Constant), SCP6, SCP3, SCP1

e. Predictors: (Constant), SCP6, SCP3

f. Predictors: (Constant), SCP3

g. Dependent Variable: QUALITY

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	SCP6, SCP3, SCP2, SCP5, SCP1, SCP4[a]	.	Enter
2	.	SCP5	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SCP2	Backward (criterion: Probability of F-to-remove >= .100).
4	.	SCP4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SCP1	Backward (criterion: Probability of F-to-remove >= .100).
6	.	SCP6	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: QUALITY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	8.652	.905		9.564	.000	6.811	10.492			
	SCP1	-.157	.218	-.181	-.721	.476	-.600	.286	-.486	-.125	-.094
	SCP2	3.755E-02	.184	.040	.204	.840	-.338	.413	-.265	.035	.027
	SCP3	-.505	.177	-.671	-2.847	.008	-.866	-.144	-.631	-.444	-.373
	SCP4	.104	.248	.111	.420	.677	-.400	.608	-.309	.073	.055
	SCP5	4.532E-02	.229	.045	.198	.844	-.420	.511	-.289	.034	.026
	SCP6	.129	.173	.137	.744	.462	-.223	.481	-.145	.128	.097
2	(Constant)	8.651	.892		9.701	.000	6.839	10.463			
	SCP1	-.173	.199	-.200	-.871	.390	-.578	.231	-.486	-.148	-.112
	SCP2	2.680E-02	.174	.029	.154	.878	-.326	.380	-.265	.026	.020
	SCP3	-.489	.156	-.650	-3.137	.004	-.806	-.172	-.631	-.474	-.405
	SCP4	.135	.190	.144	.708	.484	-.252	.521	-.309	.120	.091
	SCP6	.144	.152	.154	.950	.349	-.164	.453	-.145	.161	.12[illegible]
3	(Constant)	8.639	.876		9.860	.000	6.861	10.418			
	SCP1	-.180	.192	-.207	-.938	.355	-.569	.209	-.486	-.157	-.11[illegible]
	SCP3	-.482	.147	-.641	-3.284	.002	-.780	-.184	-.631	-.485	-.41[illegible]
	SCP4	.149	.165	.159	.898	.375	-.187	.484	-.309	.150	.11[illegible]
	SCP6	.151	.144	.161	1.051	.300	-.141	.443	-.145	.175	.134
4	(Constant)	9.030	.759		11.900	.000	7.491	10.569			
	SCP1	-.120	.179	-.138	-.669	.508	-.484	.244	-.486	-.111	-.08[illegible]
	SCP3	-.449	.142	-.598	-3.169	.003	-.737	-.162	-.631	-.467	-.40[illegible]
	SCP6	.161	.143	.171	1.126	.268	-.129	.451	-.145	.184	.14[illegible]
5	(Constant)	8.947	.743		12.041	.000	7.442	10.453			
	SCP3	-.514	.103	-.683	-4.964	.000	-.723	-.304	-.631	-.632	-.626
	SCP6	.122	.129	.130	.941	.353	-.140	.384	-.145	.153	.119
6	(Constant)	9.487	.472		20.105	.000	8.532	10.442			
	SCP3	-.475	.095	-.631	-5.015	.000	-.666	-.283	-.631	-.631	-.631

Analysis for SP-Quality-BS

Analysis for SP-Quality-BS

Model Summary[g]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.659[a]	.434	.331	1.060144	.434	4.212	6	33	.003
2	.658[b]	.433	.350	1.045059	-.001	.039	1	35	.844
3	.658[c]	.433	.368	1.030381	.000	.024	1	36	.878
4	.648[d]	.420	.371	1.027619	-.013	.807	1	37	.375
5	.642[e]	.412	.381	1.019925	-.007	.448	1	38	.508
6	.631[f]	.398	.382	1.018392	-.014	.886	1	39	.353

a. Predictors: (Constant), SCP6, SCP3, SCP2, SCP5, SCP1, SCP4

b. Predictors: (Constant), SCP6, SCP3, SCP2, SCP1, SCP4

c. Predictors: (Constant), SCP6, SCP3, SCP1, SCP4

d. Predictors: (Constant), SCP6, SCP3, SCP1

e. Predictors: (Constant), SCP6, SCP3

f. Predictors: (Constant), SCP3

g. Dependent Variable: QUALITY

Analysis for SP-Quality-BS

Model		Tolerance	VIF
1	(Constant)		
	SCP1	.273	3.670
	SCP2	.444	2.253
	SCP3	.309	3.241
	SCP4	.244	4.101
	SCP5	.325	3.073
	SCP6	.506	1.975
2	(Constant)		
	SCP1	.317	3.153
	SCP2	.486	2.059
	SCP3	.388	2.576
	SCP4	.401	2.496
	SCP6	.638	1.567
3	(Constant)		
	SCP1	.332	3.010
	SCP3	.426	2.349
	SCP4	.516	1.938
	SCP6	.694	1.440
4	(Constant)		
	SCP1	.378	2.649
	SCP3	.453	2.206
	SCP6	.698	1.432
5	(Constant)		
	SCP3	.839	1.192
	SCP6	.839	1.192
6	(Constant)		
	SCP3	1.000	1.000

a. Dependent Variable: QUALITY

Coefficient Correlations[a]

Model			SCP6	SCP3	SCP2	SCP5	SCP1	SCP4
1	Correlations	SCP6	1.000	.292	-.376	-.455	-.496	.333
		SCP3	.292	1.000	-.387	-.453	-.631	.237
		SCP2	-.376	-.387	1.000	.294	.299	-.536
		SCP5	-.455	-.453	.294	1.000	.375	-.626
		SCP1	-.496	-.631	.299	.375	1.000	-.523
		SCP4	.333	.237	-.536	-.626	-.523	1.000

Coefficients^a

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	8.858	.940		9.419	.000	6.945	10.771			
	SCP1	6.662E-02	.226	.076	.294	.770	-.394	.527	-.421	.051	.040
	SCP2	-1.427E-02	.192	-.015	-.074	.941	-.404	.376	-.339	-.013	-.010
	SCP3	-.535	.184	-.706	-2.900	.007	-.910	-.160	-.623	-.451	-.392
	SCP4	8.359E-02	.257	.089	.325	.747	-.440	.607	-.327	.056	.044
	SCP5	-1.685E-03	.238	-.002	-.007	.994	-.486	.482	-.364	-.001	-.001
	SCP6	-4.611E-02	.180	-.049	-.256	.799	-.412	.320	-.261	-.045	-.035
2	(Constant)	8.858	.926		9.561	.000	6.975	10.741			
	SCP1	6.722E-02	.207	.077	.325	.747	-.353	.487	-.421	.056	.043
	SCP2	-1.387E-02	.181	-.015	-.077	.939	-.381	.353	-.339	-.013	-.010
	SCP3	-.535	.162	-.706	-3.306	.002	-.864	-.206	-.623	-.493	-.440
	SCP4	8.245E-02	.198	.088	.417	.679	-.319	.484	-.327	.071	.056
	SCP6	-4.669E-02	.158	-.049	-.296	.769	-.368	.274	-.261	-.051	-.039
3	(Constant)	8.864	.910		9.740	.000	7.016	10.711			
	SCP1	7.060E-02	.199	.081	.355	.725	-.334	.475	-.421	.060	.047
	SCP3	-.539	.152	-.711	-3.537	.001	-.848	-.230	-.623	-.513	-.464
	SCP4	7.527E-02	.172	.080	.438	.664	-.273	.424	-.327	.074	.058
	SCP6	-5.014E-02	.149	-.053	-.336	.739	-.353	.253	-.261	-.057	-.044
4	(Constant)	8.709	.775		11.234	.000	7.137	10.281			
	SCP1	4.678E-02	.184	.054	.255	.800	-.326	.419	-.421	.042	.033
	SCP3	-.538	.150	-.710	-3.573	.001	-.843	-.232	-.623	-.512	-.463
	SCP4	7.086E-02	.169	.075	.419	.678	-.272	.414	-.327	.070	.054
5	(Constant)	8.744	.754		11.603	.000	7.217	10.270			
	SCP3	-.516	.123	-.681	-4.188	.000	-.766	-.266	-.623	-.567	-.536
	SCP4	8.814E-02	.153	.094	.576	.568	-.222	.398	-.327	.094	.074
6	(Constant)	9.077	.479		18.941	.000	8.107	10.047			
	SCP3	-.472	.096	-.623	-4.916	.000	-.667	-.278	-.623	-.623	-.623

Coefficients^a

Model		Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)		
	SCP1	.273	3.670
	SCP2	.444	2.253
	SCP3	.309	3.241
	SCP4	.244	4.101
	SCP5	.325	3.073
	SCP6	.506	1.975
2	(Constant)		
	SCP1	.317	3.153
	SCP2	.486	2.059
	SCP3	.388	2.576
	SCP4	.401	2.496
	SCP6	.638	1.567
3	(Constant)		
	SCP1	.332	3.010
	SCP3	.426	2.349
	SCP4	.516	1.938
	SCP6	.694	1.440
4	(Constant)		
	SCP1	.380	2.629
	SCP3	.426	2.347
	SCP4	.519	1.927
5	(Constant)		
	SCP3	.619	1.616
	SCP4	.619	1.616
6	(Constant)		
	SCP3	1.000	1.000

a. Dependent Variable: COST

Analysis for SP-Cost-BS

Coefficient Correlations^a

Model			SCP6	SCP3	SCP2	SCP5	SCP1	SCP4
1	Correlations	SCP6	1.000	.292	-.376	-.455	-.496	.333
		SCP3	.297	1.000	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX N

Neural network analysis outputs for the site coordination problems analysis

Neural network outputs of the time performance analysis

Neural network output of SP-Time-All-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	7.072700977	-1.072700977
2	8	7.233970165	0.766029835
3	7	7.240585804	-0.240585804
4	7.5	7.236544609	0.263455391
5	7	7.130554199	-0.130554199
6	6	7.115562916	-1.115562916
7	6	7.058255672	-1.058255672
8	7	7.139027596	-0.139027596
9	6	7.174534321	-1.174534321
10	7	7.014541626	-0.014541626
11	7	7.288320065	-0.288320065
12	6.5	7.071115017	-0.571115017
13	7	7.144268513	-0.144268513
14	7	7.112388134	-0.112388134
15	8	7.273878574	0.726121426
16	6	6.871355057	-0.871355057
17	10	7.661239624	2.338760376
18	6	7.194402695	-1.194402695
19	3	6.455701351	-3.455701351
20	8	7.276910305	0.723089695
21	5	7.157739639	-2.157739639
22	8	7.091452599	0.908547401
23	10	7.818020821	2.181979179
24	5	6.915557861	-1.915557861
25	7	7.098211288	-0.098211288
26	7	7.14976263	-0.14976263
27	3	6.519958019	-3.519958019
28	8	7.567216873	0.432783127
29	1	6.206278324	-5.206278324
30	8	7.651328087	0.348671913
31	9	7.356362343	1.643637657
32	8	7.575911045	0.424088955
33	8	7.428477287	0.571522713
34	2	6.451672077	-4.451672077
35	5	7.242360592	-2.242360592
36	5	7.025746822	-2.025746822
37	8	7.371185303	0.628814697
38	7	7.26303339	-0.26303339
39	5	7.17764473	-2.17764473
40	9	7.397877216	1.602122784
41	7	7.48410511	-0.48410511
42	9	7.600018978	1.399981022
43	7	7.551478386	-0.551478386

44	7	7.212287903	-0.212287903
45	7	7.112936974	-0.112936974
46	7	7.334058285	-0.334058285
47	8	7.247677326	0.752322674
48	7	7.401892185	-0.401892185
49	8	7.105949402	0.894050598
50	8	7.11443758	0.88556242
51	7	7.207418919	-0.207418919
52	8	7.285791397	0.714208603
53	7	7.069536686	-0.069536686
54	7	7.250967979	-0.250967979
55	7.5	7.047465801	0.452534199
56	7	7.147051334	-0.147051334
57	7.5	7.189447403	0.310552597
58	7.5	7.209864616	0.290135384
59	7.5	7.254650116	0.245349884
60	7	7.107308388	-0.107308388
61	7	7.193646908	-0.193646908
62	6.5	7.077860355	-0.577860355
63	7.5	7.088716984	0.411283016
64	7.5	7.267693043	0.232306957
65	7.5	7.089688301	0.410311699
66	7	7.07440424	-0.07440424
67	7	7.173915863	-0.173915863
68	8	7.235811234	0.764188766
69	8	7.470532894	0.529467106
70	8	7.119037151	0.880962849
71	7	7.554624081	-0.554624081
72	4	6.4025774	-2.4025774
73	7.5	7.428241253	0.071758747
74	10	7.284876347	2.715123653
75	1	6.250024319	-5.250024319
76	7	7.431699753	-0.431699753
77	10	7.885385036	2.114614964
78	7	7.511038303	-0.511038303
79	8	8.081315994	-0.081315994
80	7	7.191252708	-0.191252708
81	7	7.083951473	-0.083951473
82	7	7.09500742	-0.09500742
83	7	7.073182583	-0.073182583
84	7.5	7.229719639	0.270280361
85	7	7.004379749	-0.004379749
86	7	7.083487988	-0.083487988
87	7	7.000405312	-0.000405312
88	6	7.151715755	-1.151715755
89	7.5	7.04624033	0.45375967

90	7.5	7.252101898	0.247898102
91	6.5	6.941350937	-0.441350937
92	7.5	7.028026104	0.471973896
93	7	7.001637459	-0.001637459
94	7	7.12637043	-0.12637043
95	7.5	7.052735806	0.447264194
96	7	7.061534882	-0.061534882
97	7	7.183102131	-0.183102131
98	8	7.27268219	0.72731781
99	9	7.470292568	1.529707432
100	6	6.780644894	-0.780644894
101	5	6.712666512	-1.712666512
102	5	6.839725971	-1.839725971
103	7	7.018606663	-0.018606663
104	7	8.013103485	-1.013103485
105	7	7.357983112	-0.357983112
106	8	7.115004539	0.884995461
107	7	7.064985752	-0.064985752
108	7	7.013719082	-0.013719082
109	9	7.527917385	1.472082615
110	5	6.572478771	-1.572478771
111	7.5	7.22556448	0.27443552
112	6	6.913999081	-0.913999081
113	5	7.608352184	-2.608352184
114	8	7.459674358	0.540325642
115	3	6.26011467	-3.26011467
116	10	7.492265701	2.507734299
117	8	7.201222897	0.798777103

Neural network output of SP-Time-All-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	7.128321171	-1.128321171
2	8	7.257210255	0.742789745
3	7	7.22616148	-0.22616148
4	7.5	7.269859791	0.230140209
5	7	7.196075916	-0.196075916
6	6	7.1654706	-1.1654706
7	6	7.112397671	-1.112397671
8	7	7.152992249	-0.152992249
9	6	7.164985657	-1.164985657
10	7	7.102010727	-0.102010727
11	7	7.247974396	-0.247974396
12	6.5	7.164985657	-0.664985657
13	7	7.155106068	-0.155106068
14	7	7.156953812	-0.156953812
15	8	7.149075985	0.850924015
16	6	7.066208839	-1.066208839
17	10	7.380714893	2.619285107
18	6	7.191250801	-1.191250801
19	3	6.86605835	-3.86605835
20	8	7.217991352	0.782008648
21	5	7.164985657	-2.164985657
22	8	7.147093773	0.852906227
23	10	7.462761879	2.537238121
24	5	7.058854103	-2.058854103
25	7	7.040301323	-0.040301323
26	7	7.1654706	-0.1654706
27	3	6.896532059	-3.896532059
28	8	7.310495853	0.689504147
29	1	6.740533829	-5.740533829
30	8	7.339710712	0.660289288
31	9	7.196075916	1.803924084
32	8	7.351047993	0.648952007
33	8	7.352070332	0.647929668
34	2	6.902330875	-4.902330875
35	5	7.164985657	-2.164985657
36	5	7.13437748	-2.13437748
37	8	7.289253712	0.710746288
38	7	7.238154411	-0.238154411
39	5	7.164985657	-2.164985657
40	9	7.252313614	1.747686386
41	7	7.373883247	-0.373883247

44	7	7.155106068	-0.155106068
45	7	7.124493122	-0.124493122
46	7	7.226659775	-0.226659775
47	8	7.175349712	0.824650288
48	7	7.249779701	-0.249779701
49	8	7.133173466	0.866826534
50	8	7.215286732	0.784713268
51	7	7.179227829	-0.179227829
52	8	7.216304302	0.783695698
53	7	7.174852848	-0.174852848
54	7	7.252313614	-0.252313614
55	7.5	7.154619217	0.345380783
56	7	7.185219765	-0.185219765
57	7.5	7.211950302	0.288049698
58	7.5	7.205945015	0.294054985
59	7.5	7.247448444	0.252551556
60	7	7.205441952	-0.205441952
61	7	7.175349712	-0.175349712
62	6.5	7.059776306	-0.559776306
63	7.5	7.124014854	0.375985146
64	7.5	7.257779598	0.242220402
65	7.5	7.144742012	0.355257988
66	7	7.185713768	-0.185713768
67	7	7.211950302	-0.211950302
68	8	7.245836258	0.754163742
69	8	7.351047993	0.648952007
70	8	7.247974396	0.752025604
71	7	7.307853222	-0.307853222
72	4	6.870173931	-2.870173931
73	7.5	7.338084221	0.161915779
74	10	7.252819538	2.747180462
75	1	6.74664259	-5.74664259
76	7	7.372159958	-0.372159958
77	10	7.533372879	2.466627121
78	7	7.411886692	-0.411886692
79	8	7.611638069	0.388361931
80	7	7.206435204	-0.206435204
81	7	7.098145008	-0.098145008
82	7	7.112864971	-0.112864971
83	7	7.138699055	-0.138699055
84	7.5	7.205945015	0.294054985
85	7	7.132698536	-0.132698536

87	7	[illegible]	[illegible]
88	6	7.205441952	-1.205441952
89	7.5	7.145218372	0.354781628
90	7.5	7.238154411	0.261845589
91	6.5	7.072239876	-0.572239876
92	7.5	7.128321171	0.371678829
93	7	7.065759182	-0.065759182
94	7	7.169345379	-0.169345379
95	7.5	7.164985657	0.335014343
96	7	7.1654706	-0.1654706
97	7	7.221279144	-0.221279144
98	8	7.266002655	0.733997345
99	9	7.398561954	1.601438046
100	6	7.019512653	-1.019512653
101	5	6.978419304	-1.978419304
102	5	6.990638733	-1.990638733
103	7	7.144742012	-0.144742012
104	7	7.56140089	-0.56140089
105	7	7.299051762	-0.299051762
106	8	7.153950214	0.846049786
107	7	7.152992249	-0.152992249
108	7	7.154619217	-0.154619217
109	9	7.365099907	1.634900093
110	5	6.946461201	-1.946461201
111	7.5	7.185713768	0.314286232
112	6	7.144252777	-1.144252777
113	5	7.299559116	-2.299559116
114	8	7.245836258	0.754163742
115	3	6.783059597	-3.783059597
116	10	7.390950203	2.609049797
117	8	7.224357128	0.775642872

Neural network output of SP-Time-Fin-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	6.404217243	-0.404217243
2	8	7.369976044	0.630023956
3	7	7.121368408	-0.121368408
4	7.5	6.951290131	0.548709869
5	7	6.72563076	0.27436924
6	6	6.756899834	-0.756899834
7	6	6.306370258	-0.306370258
8	7	6.463572979	0.536427021
9	6	6.883361816	-0.883361816
10	7	6.018783569	0.981216431
11	7	7.420206547	-0.420206547
12	6.5	6.221542358	0.278457642
13	7	6.879085064	0.120914936
14	7	6.738660812	0.261339188
15	8	7.573978424	0.426021576
16	6	5.848385334	0.151614666
17	10	8.913572311	1.086427689
18	6	6.674895763	-0.674895763
19	3	3.501139879	-0.501139879
20	8	7.573782444	0.426217556
21	5	6.336666584	-1.336666584
22	8	6.819324493	1.180675507
23	10	9.670913696	0.329086304
24	5	4.942551136	0.057448864
25	7	7.149258614	-0.149258614
26	7	6.819718838	0.180281162
27	3	3.830513716	-0.830513716
28	8	8.550035477	-0.550035477
29	1	2.424388409	-1.424388409
30	8	9.208083153	-1.208083153
31	9	7.925522804	1.074477196
32	8	8.696399689	-0.696399689
33	8	8.734901428	-0.734901428
34	2	3.169351101	-1.169351101
35	5	7.300567627	-2.300567627
36	5	6.055158615	-1.055158615
37	8	8.098042488	-0.098042488
38	7	7.456647396	-0.456647396
39	5	6.93647337	-1.93647337
40	9	7.774618626	1.225381374
41	7	8.03672123	-1.03672123
42	9	8.903969765	0.096030235
43	7	8.073497772	-1.073497772

Neural network output of SP-Time-Fin-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	6.774665833	-0.774665833
2	8	7.824403763	0.175596237
3	7	7.403888226	-0.403888226
4	7.5	6.63288641	0.86711359
5	7	7.004591465	-0.004591465
6	6	7.403888226	-1.403888226
7	6	6.76936245	-0.76936245
8	7	6.591001511	0.408998489
9	6	6.944125652	-0.944125652
10	7	6.266365528	0.733634472
11	7	7.425457001	-0.425457001
12	6.5	6.452642918	0.047357082
13	7	7.391919136	-0.391919136
14	7	6.944125652	0.055874348
15	8	8.052083969	-0.052083969
16	6	6.633807659	-0.633807659
17	10	8.412905693	1.587094307
18	6	6.686433315	-0.686433315
19	3	3.317062855	-0.317062855
20	8	7.939334869	0.060665131
21	5	5.847421646	-0.847421646
22	8	7.137071609	0.862928391
23	10	9.233923912	0.766076088
24	5	4.539137363	0.460862637
25	7	8.145541191	-1.145541191
26	7	7.495388985	-0.495388985
27	3	3.955536366	-0.955536366
28	8	8.580636978	-0.580636978
29	1	1.977618337	-0.977618337
30	8	9.132388115	-1.132388115
31	9	8.263762474	0.736237526
32	8	8.595082283	-0.595082283
33	8	9.013809204	-1.013809204
34	2	2.128861189	-0.128861189
35	5	7.115045547	-2.115045547
36	5	6.408094406	-1.408094406
37	8	8.39566803	-0.39566803
38	7	7.706878662	-0.706878662
39	5	7.373954773	-2.373954773
40	9	7.883338451	1.116661549
41	7	8.316226959	-1.316226959
42	9	8.818014145	0.181985855
43	7	7.647672176	-0.647672176

Neural network output of SP-Time-Str-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.530685902	-0.530685902
2	7	7.481821537	-0.481821537
3	7	7.563849449	-0.563849449
4	8	7.538241863	0.461758137
5	7	7.552651882	-0.552651882
6	8	7.523984909	0.476015091
7	8	7.504668713	0.495331287
8	7	7.500544071	-0.500544071
9	8	7.562177181	0.437822819
10	7	7.519352436	-0.519352436
11	7	7.577716351	-0.577716351
12	7.5	7.502910137	-0.002910137
13	7	7.551665306	-0.551665306
14	7.5	7.55435276	-0.05435276
15	7.5	7.505360126	-0.005360126
16	7.5	7.52184391	-0.02184391
17	7	7.463290215	-0.463290215
18	7	7.476213932	-0.476213932
19	6.5	7.389806747	-0.889806747
20	7.5	7.413508415	0.086491585
21	7.5	7.594108582	-0.094108582
22	7.5	7.477776527	0.022223473
23	7	7.486021996	-0.486021996
24	7	7.564577103	-0.564577103
25	8	7.518128872	0.481871128
26	8	7.635647774	0.364352226
27	8	7.544880867	0.455119133
28	7	7.628566742	-0.628566742
29	4	7.311065197	-3.311065197
30	7.5	7.567502499	-0.067502499
31	10	7.591150284	2.408849716
32	1	7.163478374	-6.163478374
33	7	7.557165623	-0.557165623
34	10	7.745735645	2.254264355

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Neural network output of SP-Time-Str-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.452118874	-0.452118874
2	7	7.083320141	-0.083320141
3	7	8.257650375	-1.257650375
4	8	7.578190327	0.421809673
5	7	7.771902084	-0.771902084
6	8	7.523429871	0.476570129
7	8	7.521713257	0.478286743
8	7	7.477313995	-0.477313995
9	8	8.083156586	-0.083156586
10	7	7.263810158	-0.263810158
11	7	8.117383003	-1.117383003
12	7.5	7.126169205	0.373830795
13	7	7.48768425	-0.48768425
14	7.5	7.907896996	-0.407896996
15	7.5	7.896987915	-0.396987915
16	7.5	7.663844109	-0.163844109
17	7	7.610957146	-0.610957146
18	7	7.578190327	-0.578190327
19	6.5	6.749454021	-0.249454021
20	7.5	6.728037834	0.771962166
21	7.5	7.863270283	-0.363270283
22	7.5	7.223989487	0.276010513
23	7	7.784742832	-0.784742832
24	7	7.907896996	-0.907896996
25	8	7.841155529	0.158844471
26	8	8.723723412	-0.723723412
27	8	7.945516586	0.054483414
28	7	8.800926208	-1.800926208
29	4	4.231323242	-0.231323242
30	7.5	8.264947891	-0.764947891
31	10	8.361326218	1.638673782
32	1	2.502709627	-1.502709627
33	7	8.469993591	-1.469993591
34	10	9.404905319	0.595094681

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Neural network output of SP-Time-BS-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	10	8.890468597	1.109531403
2	7	8.188874245	-1.188874245
3	8	9.233642578	-1.233642578
4	7	7.381025314	-0.381025314
5	7	7.128242016	-0.128242016
6	7	7.158718109	-0.158718109
7	7	7.190574646	-0.190574646
8	7.5	7.479189873	0.020810127
9	7	7.103974342	-0.103974342
10	7	7.210937023	-0.210937023
11	7	7.024955273	-0.024955273
12	6	7.406431198	-1.406431198
13	7.5	6.986235619	0.513764381
14	7.5	7.527733326	-0.027733326
15	6.5	6.838950157	-0.338950157
16	7.5	7.075249672	0.424750328
17	7	6.958772659	0.041227341
18	7	7.335427284	-0.335427284
19	7.5	7.221819878	0.278180122
20	7	7.20215416	-0.20215416
21	7	7.546744347	-0.546744347
22	8	7.910601616	0.089398384
23	9	8.38975811	0.61024189
24	6	6.348173618	-0.348173618
25	5	6.480960846	-1.480960846
26	5	6.477757454	-1.477757454
27	7	7.123325348	-0.123325348
28	7	9.112023354	-2.112023354
29	7	7.807496071	-0.807496071
30	8	7.216395378	0.783604622
31	7	7.270219803	-0.270219803
32	7	7.023287296	-0.023287296
33	9	8.098620415	0.901379585
34	5	6.122050762	-1.122050762
35	7.5	7.370039463	0.129960537
36	6	6.848405838	-0.848405838
37	5	8.146091461	-3.146091461
38	8	7.842186451	0.157813549
39	3	5.307500362	-2.307500362
40	10	8.289855957	1.710144043

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Neural network output of SP-Time-BS-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	10	8.157829285	1.842170715
2	7	8.028859138	-1.028859138
3	8	8.443934441	-0.443934441
4	7	7.249175549	-0.249175549
5	7	6.632792473	0.367207527
6	7	6.964326382	0.035673618
7	7	7.249175549	-0.249175549
8	7.5	7.492790222	0.007209778
9	7	7.492790222	-0.492790222
10	7	7.249175549	-0.249175549
11	7	7.249175549	-0.249175549
12	6	7.70062685	-1.70062685
13	7.5	6.632792473	0.867207527
14	7.5	7.249175549	0.250824451
15	6.5	6.249751568	0.250248432
16	7.5	7.249175549	0.250824451
17	7	6.964326382	0.035673618
18	7	7.492790222	-0.492790222
19	7.5	7.249175549	0.250824451
20	7	6.964326382	0.035673618
21	7	7.70062685	-0.70062685
22	8	8.157829285	-0.157829285
23	9	8.443934441	0.556065559
24	6	6.249751568	-0.249751568
25	5	5.811959267	-0.811959267
26	5	4.774831772	0.225168228
27	7	6.964326382	0.035673618
28	7	8.443934441	-1.443934441
29	7	7.70062685	-0.70062685
30	8	7.249175549	0.750824451
31	7	7.70062685	-0.70062685
32	7	7.249175549	-0.249175549
33	9	8.028859138	0.971140862
34	5	5.811959267	-0.811959267
35	7.5	7.249175549	0.250824451
36	6	7.249175549	-1.249175549
37	5	7.492790222	-2.492790222
38	8	8.028859138	-0.028859138
39	3	3.576263905	-0.576263905
40	10	8.028859138	1.971140862

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Neural network outputs of the cost performance analysis

Neural network output of SP-Cost-All-I

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7.5	7.449905396	0.050094604
2	8	7.510287285	0.489712715
3	7	7.556342125	-0.556342125
4	7.5	7.255129814	0.244870186
5	7	6.942710876	0.057289124
6	8	7.176362514	0.823637486
7	6	7.239731789	-1.239731789
8	7	7.445717335	-0.445717335
9	7	7.235821724	-0.235821724
10	8	7.2301898	0.7698102
11	7	7.48434639	-0.48434639
12	7	7.250977993	-0.250977993
13	7.5	7.216821194	0.283178806
14	7	6.931744099	0.068255901
15	7	7.48628521	-0.48628521
16	7	6.627871037	0.372128963
17	8	7.969512463	0.030487537
18	3	7.143773556	-4.143773556
19	7.5	5.758161545	1.741838455
20	8	7.299111366	0.700888634
21	5	6.241065025	-1.241065025
22	7	6.654902935	0.345097065
23	10	8.099614143	1.900385857
24	6	7.397805691	-1.397805691
25	5	5.11831665	-0.11831665
26	5	7.12398243	-2.12398243
27	3.5	6.068733692	-2.568733692
28	9	7.655720711	1.344279289
29	3	5.26819849	-2.26819849
30	10	8.130347252	1.869652748
31	7	7.152303219	-0.152303219
32	6	7.682256699	-1.682256699
33	6	7.484893799	-1.484893799
34	5.5	5.741539478	-0.241539478
35	5	7.050944805	-2.050944805
36	7	7.260471344	-0.260471344
37	5	7.528660297	-2.528660297
38	7	7.39131403	-0.39131403
39	7	7.48049736	-0.48049736
40	7	7.610270977	-0.610270977
41	7	7.958825588	-0.958825588
42	8	7.81196928	0.18803072
43	7	7.742786884	-0.742786884

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44	7	7.379798889	-0.379798889
45	7	7.184505463	-0.184505463
46	8	7.615044594	0.384955406
47	8	7.316771507	0.683228493
48	7	6.94305706	0.05694294
49	7	7.291999817	-0.291999817
50	8	7.433376789	0.566623211
51	7.5	7.614827633	-0.114827633
52	8	7.637177944	0.362822056
53	7	7.221238136	-0.221238136
54	7	7.532823086	-0.532823086
55	8	7.24122715	0.75877285
56	7.5	7.387424946	0.112575054
57	8	7.112955093	0.887044907
58	8	7.523957253	0.476042747
59	7	7.466086388	-0.466086388
60	8	7.438767433	0.561232567
61	6.5	7.360035896	-0.860035896
62	7.5	7.627951145	-0.127951145
63	8	6.975447655	1.024552345
64	7.5	7.478729248	0.021270752
65	6.5	7.010668278	-0.510668278
66	7.5	6.873009205	0.626990795
67	7	7.255020618	-0.255020618
68	8	7.798403263	0.201596737
69	7	7.590788364	-0.590788364
70	7	7.243110657	-0.243110657
71	9.5	8.406407356	1.193592262
72	8	6.359230995	1.640769005
73	5	7.862985134	-2.862985134
74	7	7.562437534	-0.562437534
75	5	4.75703764	0.24296236
76	7	7.459169388	-0.459169388
77	7	7.932612896	-0.932612896
78	7.5	7.463389397	0.036610603
79	8	8.415299416	-0.415299416
80	8	7.220666409	0.779333591
81	7	6.85316658	0.14683342
82	7	6.827541828	0.172458172
83	7	7.237090588	-0.237090588
84	8	7.527293682	0.472706318
85	7	7.378399849	-0.378399849
86	7.5	7.307454586	0.192545414
87	7.5	7.186496258	0.313503742
88	7	7.391658306	-0.391658306
89	7.5	6.776256561	0.723743439

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90	7	7.249141216	-0.249141216
91	7	6.61903286	0.38096714
92	7.5	7.097883224	0.402116776
93	7	6.902258396	0.097741604
94	8	7.399766445	0.600233555
95	8	7.157274246	0.842725754
96	7	6.977751732	0.022248268
97	7	7.497630119	-0.497630119
98	6	7.800610065	-1.800610065
99	8	7.931036949	0.068963051
100	5	6.528855801	-1.528855801
101	5	6.174463272	-1.174463272
102	3	5.596617222	-2.596617222
103	5	7.121046543	-2.121046543
104	8	8.661971092	-0.661971092
105	7	7.51631546	-0.51631546
106	8	7.207211018	0.792788982
107	8	7.466249466	0.533750534
108	7	7.08655405	-0.08655405
109	7	7.782571316	-0.782571316
110	4	6.031725407	-2.031725407
111	6	6.977231026	-0.977231026
112	5	7.209950447	-2.209950447
113	5	7.990751743	-2.990751743
114	8	7.754747391	0.245252609
115	5	5.050765991	-0.050765991
116	9	7.697437286	1.302562714
117	8	7.999996662	3.33786E-06

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Neural network output of SP-Cost-All-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7.5	7.195646763	0.304353237
2	8	7.338230133	0.661769867
3	7	7.338230133	-0.338230133
4	7.5	7.022705555	0.477294445
5	7	6.84109211	0.15890789
6	8	6.847718239	1.152281761
7	6	7.022705555	-1.022705555
8	7	7.257678032	-0.257678032
9	7	7.110266209	-0.110266209
10	8	7.022705555	0.977294445
11	7	7.349897861	-0.349897861
12	7	6.932975769	0.067024231
13	7.5	6.939928055	0.560071945
14	7	6.56463623	0.43536377
15	7	7.278847694	-0.278847694
16	7	6.661184788	0.338815212
17	8	7.813334942	0.186665058
18	3	6.84109211	-3.84109211
19	7.5	5.093577385	2.406422615
20	8	7.029957771	0.970042229
21	5	6.552772045	-1.552772045
22	7	6.36013031	0.63986969
23	10	7.999837875	2.000162125
24	6	7.090197086	-1.090197086
25	5	6.463302612	-1.463302612
26	5	6.753352165	-1.753352165
27	3.5	5.458555222	-1.958555222
28	9	7.349897861	1.650102139
29	3	4.727640629	-1.727640629
30	10	7.7633214	2.2366786
31	7	7.110266209	-0.110266209
32	6	7.492991924	-1.492991924
33	6	7.438724041	-1.438724041
34	5.5	4.978186131	0.521813869
35	5	7.195646763	-2.195646763
36	7	6.847718239	0.152281761
37	5	7.349897861	-2.349897861
38	7	7.195646763	-0.195646763
39	7	7.195646763	-0.195646763
40	7	7.338230133	-0.338230133
41	7	7.710790634	-0.710790634
42	8	7.639396191	0.360603809
43	7	7.840480328	-0.840480328

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46	8	7.349897861	0.650102139
47	8	7.022705555	0.977294445
48	7	6.847718239	0.152281761
49	7	6.932975769	0.067024231
50	8	7.244634628	0.755365372
51	7.5	7.338230133	0.161769867
52	8	7.349897861	0.650102139
53	7	6.832867622	0.167132378
54	7	7.338230133	-0.338230133
55	8	6.84109211	1.15890789
56	7.5	7.013791561	0.486208439
57	8	6.84109211	1.15890789
58	8	7.349897861	0.650102139
59	7	7.338230133	-0.338230133
60	8	7.338230133	0.661769867
61	6.5	7.195646763	-0.695646763
62	7.5	7.359870434	0.140129566
63	8	6.847718239	1.152281761
64	7.5	7.257678032	0.242321968
65	6.5	6.753352165	-0.253352165
66	7.5	6.747075558	0.752924442
67	7	6.932975769	0.067024231
68	8	7.877371788	0.122628212
69	7	7.567228794	-0.567228794
70	7	7.013791561	-0.013791561
71	9.5	7.877371788	1.722627831
72	8	5.220143795	2.779856205
73	5	7.962844849	-2.962844849
74	7	7.349897861	-0.349897861
75	5	4.598177433	0.401822567
76	7	7.777616024	-0.777616024
77	7	8.152407646	-1.152407646
78	7.5	7.609628677	-0.109628677
79	8	8.433349609	-0.433349609
80	8	6.932975769	1.067024231
81	7	6.852692127	0.147307873
82	7	6.847718239	0.152281761
83	7	7.022705555	-0.022705555
84	8	7.269100666	0.730899334
85	7	7.10104847	-0.10104847
86	7.5	7.022705555	0.477294445
87	7.5	7.022705555	0.477294445
88	7	7.175000668	-0.175000668
89	7.5	6.358216286	1.141783714

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92	7.5	6.84109211	0.65890789
93	7	6.847718239	0.152281761
94	8	7.186151981	0.813848019
95	8	6.932975769	1.067024231
96	7	6.753352165	0.246647835
97	7	7.4166646	-0.4166646
98	6	7.795722485	-1.795722485
99	8	8.143982887	-0.143982887
100	5	5.927540779	-0.927540779
101	5	6.254493713	-1.254493713
102	3	5.807060242	-2.807060242
103	5	6.847718239	-1.847718239
104	8	8.342756271	-0.342756271
105	7	7.338230133	-0.338230133
106	8	6.932975769	1.067024231
107	8	7.257678032	0.742321968
108	7	6.650955677	0.349044323
109	7	7.609628677	-0.609628677
110	4	5.813687801	-1.813687801
111	6	6.84109211	-0.84109211
112	5	6.650955677	-1.650955677
113	5	7.651780128	-2.651780128
114	8	7.463896751	0.536103249
115	5	4.598177433	0.401822567
116	9	7.877371788	1.122628212
117	8	7.609628677	0.390371323

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Neural network output of SP-Cert-Fin-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7.5	6.894293785	0.605706215
2	8	7.072202682	0.927797318
3	7	7.064063072	-0.064063072
4	7.5	7.089289188	0.410710812
5	7	6.820068359	0.179931641
6	8	6.895042896	1.104957104
7	6	6.772013664	-0.772013664
8	7	6.830362797	0.169637203
9	7	7.025227547	-0.025227547
10	8	6.697228432	1.302771568
11	7	7.258802414	-0.258802414
12	7	6.750965595	0.249034405
13	7.5	6.987137794	0.512862206
14	7	6.965638638	0.034361362
15	7	7.282152653	-0.282152653
16	7	6.51040411	0.48959589
17	8	7.891729355	0.108270645
18	3	6.903457165	-3.903457165
19	7.5	5.655370235	1.844629765
20	8	7.264889717	0.735110283
21	5	6.695138931	-1.695138931
22	7	6.952108383	0.047891617
23	10	8.288310051	1.711689949
24	6	6.328451157	-0.328451157
25	5	6.889430046	-1.889430046
26	5	6.896969318	-1.896969318
27	3.5	5.79879427	-2.29879427
28	9	7.708968639	1.291031361
29	3	5.098133087	-2.098133087
30	10	7.937891006	2.062108994
31	7	7.331614017	-0.331614017
32	6	7.727909565	-1.727909565
33	6	7.679206848	-1.679206848
34	5.5	5.499027252	0.000972748
35	5	7.193694115	-2.193694115
36	7	6.730933189	0.269066811
37	5	7.410847187	-2.410847187
38	7	7.233219147	-0.233219147
39	7	7.071825027	-0.071825027
40	7	7.321482658	-0.321482658
41	7	7.330795288	-0.330795288
42	8	7.861879349	0.138120651
43	7	7.534132004	-0.534132004

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Neural network output of SP-Cost-Fin-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7.5	7.409505367	0.090494633
2	8	7.130443096	0.869556904
3	7	7.130443096	-0.130443096
4	7.5	7.130443096	0.369556904
5	7	6.846037388	0.153962612
6	8	7.130443096	0.869556904
7	6	7.130443096	-1.130443096
8	7	6.988745689	0.011254311
9	7	7.270802498	-0.270802498
10	8	7.130443096	0.869556904
11	7	7.409505367	-0.409505367
12	7	6.988745689	0.011254311
13	7.5	7.270802498	0.229197502
14	7	7.270802498	-0.270802498
15	7	7.546246529	-0.546246529
16	7	7.130443096	-0.130443096
17	8	7.546246529	0.453753471
18	3	6.846037388	-3.846037388
19	7.5	6.558917999	0.941082001
20	8	7.409505367	0.590494633
21	5	6.415174007	-1.415174007
22	7	7.270802498	-0.270802498
23	10	7.941893101	2.058106899
24	6	6.702649117	-0.702649117
25	5	7.130443096	-2.130443096
26	5	6.988745689	-1.988745689
27	3.5	6.702649117	-3.202649117
28	9	7.409505367	1.590494633
29	3	6.128952503	-3.128952503
30	10	7.680735588	2.319264412
31	7	7.270802498	-0.270802498
32	6	7.409505367	-1.409505367
33	6	7.812700748	-1.812700748
34	5.5	6.128952503	-0.628952503
35	5	7.409505367	-2.409505367
36	7	7.130443096	-0.130443096
37	5	7.409505367	-2.409505367
38	7	7.409505367	-0.409505367
39	7	7.409505367	-0.409505367
40	7	7.130443096	-0.130443096
41	7	6.846037388	0.153962612
42	8	7.680735588	0.319264412
43	7	7.130443096	-0.130443096

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Neural network output of SP-Cost-Str-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.772724628	-0.772724628
2	7	7.495844841	-0.495844841
3	8	8.293164253	-0.293164253
4	8	7.793839931	0.206160069
5	7	7.048012733	-0.048012733
6	7	8.18501091	-1.18501091
7	8	7.344745636	0.655254364
8	7.5	7.695345402	-0.195345402
9	8	8.128440857	-0.128440857
10	7	7.383821011	-0.383821011
11	7	7.82728529	-0.82728529
12	8	7.351130009	0.648869991
13	7.5	7.624740124	-0.124740124
14	8	7.784793854	0.215206146
15	8	7.84027338	0.15972662
16	7	7.094110966	-0.094110966
17	8	7.412905216	0.587094784
18	6.5	7.639781952	-1.139781952
19	7.5	7.946053505	-0.446053505
20	8	7.026047707	0.973952293
21	7.5	7.406529427	0.093470573
22	6.5	7.471632004	-0.971632004
23	7.5	7.771140099	-0.271140099
24	7	7.797921181	-0.797921181
25	8	7.542778492	0.457221508
26	7	7.815824032	-0.815824032
27	7	7.418747902	-0.418747902
28	9	8.731584549	1.16841507
29	8	7.208209991	0.791790009
30	5	7.355072021	-2.355072021
31	7	8.159703255	-1.159703255
32	5	6.74321413	-1.74321413
33	7	6.856918812	0.143081188
34	7	7.787915707	-0.787915707

Neural network output of SP-Cost-Str-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.570287228	-0.570287228
2	7	7.53758955	-0.53758955
3	8	7.667831898	0.332168102
4	8	7.570287228	0.429712772
5	7	7.507276535	-0.507276535
6	7	7.6179986	-0.6179986
7	8	7.50483036	0.49516964
8	7.5	7.545169353	-0.045169353
9	8	7.635426998	0.364573002
10	7	7.50483036	-0.50483036
11	7	7.595355034	-0.595355034
12	8	7.50483036	0.49516964
13	7.5	7.53758955	-0.03758955
14	8	7.595355034	0.404644966
15	8	7.602906227	0.397093773
16	7	7.48966074	-0.48966074
17	8	7.53758955	0.46241045
18	6.5	7.570287228	-1.070287228
19	7.5	7.567904472	-0.067904472
20	8	7.472029686	0.527970314
21	7.5	7.522430897	-0.022430897
22	6.5	7.53758955	-1.03758955
23	7.5	7.602906227	-0.102906227
24	7	7.595355034	-0.595355034
25	8	7.53758955	0.46241045
26	7	7.637785912	-0.637785912
27	7	7.555150032	-0.555150032
28	9	7.732219696	2.167779922
29	8	7.444349289	0.555650711
30	5	7.522430897	-2.522430897
31	7	7.660329342	-0.660329342
32	5	7.360996723	-2.360996723
33	7	7.524871826	-0.524871826
34	7	7.672505379	-0.672505379

Neural network output of SP-Cost-BS-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.792538166	-0.792538166
2	7.5	7.74260664	-0.24260664
3	8	8.153761864	-0.153761864
4	8	7.308194637	0.691805363
5	7	6.561300755	0.438699245
6	7	7.190086365	-0.190086365
7	7	7.303577423	-0.303577423
8	8	7.305968285	0.694031715
9	7	7.518592358	-0.518592358
10	7.5	7.118012428	0.381987572
11	7.5	7.325846672	0.174153328
12	7	7.784674168	-0.784674168
13	7.5	6.782149315	0.717850685
14	7	7.289494514	-0.289494514
15	7	6.009899616	0.990100384
16	7.5	7.454078197	0.045921803
17	7	7.075684071	-0.075684071
18	8	7.55910778	0.44089222
19	8	7.4534235	0.5465765
20	7	7.276177406	-0.276177406
21	7	7.524390221	-0.524390221
22	6	7.90613699	-1.90613699
23	8	8.069162369	-0.069162369
24	5	5.700348854	-0.700348854
25	5	6.141040802	-1.141040802
26	3	4.441058159	-1.441058159
27	5	7.028358936	-2.028358936
28	8	8.304102898	-0.304102898
29	7	7.793673038	-0.793673038
30	8	7.27884388	0.72115612
31	8	7.792788506	0.207211494
32	7	7.476951122	-0.476951122
33	7	8.016486168	-1.016486168
34	4	5.925038338	-1.925038338
35	6	7.592786789	-1.592786789
36	5	7.169341087	-2.169341087
37	5	6.837783337	-1.837783337
38	8	7.97226572	0.02773428
39	5	4.7420578	0.2579422
40	9	7.876384735	1.123615265

Neural network output of SP-Cost-BS-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.977895737	-0.977895737
2	7.5	7.919465542	-0.419465542
3	8	8.008665085	-0.008665085
4	8	7.254209042	0.745790958
5	7	6.572499752	0.427500248
6	7	6.943860531	0.056139469
7	7	7.254209042	-0.254209042
8	8	7.501394272	0.498605728
9	7	7.501394272	-0.501394272
10	7.5	7.254209042	0.245790958
11	7.5	7.254209042	0.245790958
12	7	7.689527035	-0.689527035
13	7.5	6.572499752	0.927500248
14	7	7.254209042	-0.254209042
15	7	6.151060581	0.848939419
16	7.5	7.254209042	0.245790958
17	7	6.943860531	0.056139469
18	8	7.501394272	0.498605728
19	8	7.254209042	0.745790958
20	7	6.943860531	0.056139469
21	7	7.689527035	-0.689527035
22	6	7.977895737	-1.977895737
23	8	8.008665085	-0.008665085
24	5	6.151060581	-1.151060581
25	5	5.69963789	-0.69963789
26	3	4.812003613	-1.812003613
27	5	6.943860531	-1.943860531
28	8	8.008665085	-0.008665085
29	7	7.689527035	-0.689527035
30	8	7.254209042	0.745790958
31	8	7.689527035	0.310472965
32	7	7.254209042	-0.254209042
33	7	7.919465542	-0.919465542
34	4	5.69963789	-1.69963789
35	6	7.254209042	-1.254209042
36	5	7.254209042	-2.254209042
37	5	7.501394272	-2.501394272
38	8	7.919465542	0.080534458
39	5	4.09008646	0.90991354
40	9	7.919465542	1.080534458

Neural network outputs of the quality performance analysis

Neural network output of SP-Quality-All-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.518613815	-0.518613815
2	7	7.641220093	-0.641220093
3	7	7.655928612	-0.655928612
4	7	7.66809845	-0.66809845
5	7.5	7.550822735	-0.050822735
6	7	7.540546894	-0.540546894
7	7	7.495079517	-0.495079517
8	7	7.567738533	-0.567738533
9	7.5	7.604866028	-0.104866028
10	7.5	7.461770535	0.038229465
11	7	7.709433556	-0.709433556
12	7	7.510375023	-0.510375023
13	7	7.571024895	-0.571024895
14	7	7.549750805	-0.549750805
15	7	7.685292244	-0.685292244
16	7.5	7.322396755	0.177603245
17	7.5	8.036536217	-0.536536217
18	6	7.616088867	-1.616088867
19	7.5	6.958393574	0.541606426
20	9	7.689566612	1.310433388
21	8	7.577589035	0.422410965
22	8	7.526651382	0.473348618
23	9	8.171990395	0.828009605
24	7	7.377375603	-0.377375603
25	8	7.501523495	0.498476505
26	5	7.566272259	-2.566272259
27	6.5	7.015733242	-0.515733242
28	10	7.945508957	2.054491043
29	2	6.725506306	-4.725506306
30	10	8.010527611	1.989472389
31	8	7.747993469	0.252006531
32	6	7.951374054	-1.951374054
33	9	7.815399647	1.184600353
34	5.5	6.959213257	-1.459213257
35	6	7.666898251	-1.666898251
36	7	7.473573685	-0.473573685
37	8	7.765843391	0.234156609
38	7	7.681367397	-0.681367397
39	8	7.607154369	0.392845631
40	8	7.792115211	0.207884789
41	8	7.856014252	0.143985748
42	8	7.976519108	0.023480892
43	8	7.942508698	0.057491302

44	7	7.629525661	-0.629525661
45	7.5	7.546714306	-0.046714306
46	7	7.730174541	-0.730174541
47	8.5	7.658288479	0.841711521
48	7	7.80621767	-0.80621767
49	8	7.524321079	0.475678921
50	8	7.554823875	0.445176125
51	7.5	7.630177498	-0.130177498
52	8	7.691723824	0.308276176
53	7	7.507312298	-0.507312298
54	7	7.667416096	-0.667416096
55	8	7.490296364	0.509703636
56	7	7.573406219	-0.573406219
57	8	7.605782032	0.394217968
58	8	7.632577419	0.367422581
59	7	7.685537338	-0.685537338
60	8	7.551445007	0.448554993
61	7	7.619627476	-0.619627476
62	7	7.513574123	-0.513574123
63	7.5	7.533657551	-0.033657551
64	8	7.688324451	0.311675549
65	8	7.524006367	0.475993633
66	6.5	7.504453182	-1.004453182
67	7	7.59408617	-0.59408617
68	8	7.672584057	0.327415943
69	7.5	7.865605831	-0.365605831
70	6	7.556594849	-1.556594849
71	8	7.922461987	0.077538013
72	4	6.903515339	-2.903515339
73	8	7.844415188	0.155584812
74	9	7.69151926	1.30848074
75	3	6.767950058	-3.767950058
76	9	7.859185696	1.140814304
77	8	8.239596367	-0.239596367
78	8	7.915036678	0.084963322
79	9	8.406449318	0.593550682
80	8.5	7.598651886	0.901348114
81	7	7.521217823	-0.521217823
82	7	7.517621994	-0.517621994
83	7	7.511933804	-0.511933804
84	8	7.645565987	0.354434013
85	8	7.449282646	0.550717354
86	7.5	7.523415089	-0.023415089
87	8	7.431736469	0.568263531
88	7	7.582865238	-0.582865238
89	7.5	7.471220493	0.028779507

90	7	7.667628288	-0.667628288
91	7	7.380435944	-0.380435944
92	8	7.471941948	0.528058052
93	7	7.440852165	-0.440852165
94	8	7.556427956	0.443572044
95	8	7.496595383	0.503404617
96	7.5	7.494346619	0.005653381
97	7.5	7.624576569	-0.124576569
98	7	7.70430088	-0.70430088
99	9	7.88106823	1.11893177
100	4	7.219365597	-3.219365597
101	7	7.1836133	-0.1836133
102	4	7.292307854	-3.292307854
103	6	7.466797352	-1.466797352
104	7	8.339146614	-1.339146614
105	8	7.755844593	0.244155407
106	8	7.52637291	0.47362709
107	8	7.504638672	0.495361328
108	8	7.457452774	0.542547226
109	9	7.907155514	1.092844486
110	4	7.036204338	-3.036204338
111	8	7.632909298	0.367090702
112	7	7.374325275	-0.374325275
113	5	7.972506046	-2.972506046
114	7	7.849085808	-0.849085808
115	5	6.777774334	-1.777774334
116	9	7.893436909	1.106563091
117	8	7.594551086	0.405448914

Neural network output of SP-Quality-All-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.523584366	-0.523584366
2	7	7.601532936	-0.601532936
3	7	7.601532936	-0.601532936
4	7	7.691542625	-0.691542625
5	7.5	7.557355404	-0.057355404
6	7	7.535263062	-0.535263062
7	7	7.489742756	-0.489742756
8	7	7.534137726	-0.534137726
9	7.5	7.557355404	-0.057355404
10	7.5	7.489742756	0.010257244
11	7	7.646614075	-0.646614075
12	7	7.557355404	-0.557355404
13	7	7.535263062	-0.535263062
14	7	7.558718204	-0.558718204
15	7	7.523584366	-0.523584366
16	7.5	7.411392689	0.088607311
17	7.5	7.778692722	-0.278692722
18	6	7.591046333	-1.591046333
19	7.5	7.266508579	0.233491421
20	9	7.602674484	1.397325516
21	8	7.557355404	0.442644596
22	8	7.536742687	0.463257313
23	9	7.844408512	1.155591488
24	7	7.466462612	-0.466462612
25	8	7.355144501	0.644855499
26	5	7.535263062	-2.535263062
27	6.5	7.288617611	-0.788617611
28	10	7.713363171	2.286636829
29	2	7.130070686	-5.130070686
30	10	7.690505505	2.309494495
31	8	7.557355404	0.442644596
32	6	7.735163689	-1.735163689
33	9	7.691542625	1.308457375
34	5.5	7.322730541	-1.822730541
35	6	7.557355404	-1.557355404
36	7	7.535263062	-0.535263062
37	8	7.646614075	0.353385925
38	7	7.624648094	-0.624648094
39	8	7.557355404	0.442644596
40	8	7.635099888	0.364900112
41	8	7.723026276	0.276973724
42	8	7.735163689	0.264836311
43	8	7.822099686	0.177900314

[illegible]	7	7.535263062	-0.535263062
45	7.5	7.513172626	-0.013172626
46	7	7.579446316	-0.579446316
47	8.5	7.557355404	0.942644596
48	7	7.669707298	-0.669707298
49	8	7.489742756	0.510257244
50	8	7.623610497	0.376389503
51	7.5	7.567875385	-0.067875385
52	8	7.579446316	0.420553684
53	7	7.579446316	-0.579446316
54	7	7.635099888	-0.635099888
55	8	7.557355404	0.442644596
56	7	7.579446316	-0.579446316
57	8	7.591046333	0.408953667
58	8	7.579446316	0.420553684
59	7	7.668567181	-0.668567181
60	8	7.601532936	0.398467064
61	7	7.557355404	-0.557355404
62	7	7.421892643	-0.421892643
63	7.5	7.535263062	-0.035263062
64	8	7.668567181	0.331432819
65	8	7.535263062	0.464736938
66	6.5	7.557355404	-1.057355404
67	7	7.591046333	-0.591046333
68	8	7.645674706	0.354325294
69	7.5	7.735163689	-0.235163689
70	6	7.646614075	-1.646614075
71	8	7.645674706	0.354325294
72	4	7.254496574	-3.254496574
73	8	7.756183624	0.243816376
74	9	7.613077641	1.386922359
75	3	7.142075062	-4.142075062
76	9	7.801243305	1.198756695
77	8	7.930813313	0.069186687
78	8	7.844408512	0.155591488
79	9	7.994465828	1.005534172
80	8.5	7.557355404	0.942644596
81	7	7.479302406	-0.479302406
82	7	7.467552662	-0.467552662
83	7	7.523584366	-0.523584366
84	8	7.579446316	0.420553684
85	8	7.511939526	0.488060474
86	7.5	7.557355404	-0.057355404
87	8	7.421892643	0.578107357
88	7	7.601532936	-0.601532936
89	7.5	7.513172626	-0.013172626

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90	7	7.624648094	-0.624648094
91	7	7.423205376	-0.423205376
92	8	7.523584366	0.476415634
93	7	7.433610916	-0.433610916
94	8	7.545730114	0.454269886
95	8	7.557355404	0.442644596
96	7.5	7.535263062	-0.035263062
97	7.5	7.635099888	-0.135099888
98	7	7.667722225	-0.667722225
99	9	7.799817562	1.200182438
100	4	7.355144501	-3.355144501
101	7	7.332939625	-0.332939625
102	4	7.356825352	-3.356825352
103	6	7.535263062	-1.535263062
104	7	7.930259705	-0.930259705
105	8	7.668567181	0.331432819
106	8	7.489742756	0.510257244
107	8	7.534137726	0.465862274
108	8	7.557355404	0.442644596
109	9	7.745622635	1.254377365
110	4	7.264750004	-3.264750004
111	8	7.557355404	0.442644596
112	7	7.557355404	-0.557355404
113	5	7.646614075	-2.646614075
114	7	7.645674706	-0.645674706
115	5	7.176176071	-2.176176071
116	9	7.778692722	1.221307278
117	8	7.511054516	0.488945484

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Neural network output of SP-Quality-Fin-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	6.960204124	0.039795876
2	7	7.061843395	-0.061843395
3	7	7.061216831	-0.061216831
4	7	7.044134617	-0.044134617
5	7.5	6.995580673	0.504419327
6	7	6.986778736	0.013221264
7	7	6.948654652	0.051345348
8	7	6.989275932	0.010724068
9	7.5	7.062594414	0.437405586
10	7.5	6.910712242	0.589287758
11	7	7.126769066	-0.126769066
12	7	6.918739796	0.081260204
13	7	7.028975964	-0.028975964
14	7	7.019554615	-0.019554615
15	7	7.176615238	-0.176615238
16	7.5	6.845211506	0.654788494
17	7.5	7.447648048	0.052351952
18	6	7.018816948	-1.018816948
19	7.5	6.479848862	1.020151138
20	9	7.140770912	1.859229088
21	8	7.007874489	0.992125511
22	8	7.02833271	0.97166729
23	9	7.599645615	1.400354385
24	7	6.75731039	0.24268961
25	8	7.097703934	0.902296066
26	5	7.00246048	-2.00246048
27	6.5	6.531800747	-0.031800747
28	10	7.348123074	2.651876926
29	2	6.239420891	-4.239420891
30	10	7.482898712	2.517101288
31	8	7.235337734	0.764662266
32	6	7.361390114	-1.361390114
33	9	7.269257069	1.730742931
34	5.5	6.434221268	-0.934221268
35	6	7.165770054	-1.165770054
36	7	6.889669895	0.110330105
37	8	7.20291853	0.79708147
38	7	7.114358902	-0.114358902
39	8	7.042821884	0.957178116
40	8	7.202524662	0.797475338
41	8	7.163738251	0.836261749
42	8	7.405622005	0.594377995
43	8	7.227847576	0.772152424

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Neural network output of SP-Quality-Fin-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.050559998	-0.050559998
2	7	7.276497364	-0.276497364
3	7	7.103831768	-0.103831768
4	7	6.989185333	0.010814667
5	7.5	7.042359829	0.457640171
6	7	7.103831768	-0.103831768
7	7	6.989185333	0.010814667
8	7	6.929977894	0.070022106
9	7.5	7.048489094	0.451510906
10	7.5	6.932137489	0.567862511
11	7	7.165252209	-0.165252209
12	7	6.929977894	0.070022106
13	7	7.105834484	-0.105834484
14	7	7.048489094	-0.048489094
15	7	7.224644661	-0.224644661
16	7.5	7.103831768	0.396168232
17	7.5	7.339506149	0.160493851
18	6	6.870905876	-0.870905876
19	7.5	6.477226734	1.022773266
20	9	7.222722054	1.777277946
21	8	6.694885731	1.305114269
22	8	7.105834484	0.894165516
23	9	7.685794353	1.314205647
24	7	6.588783741	0.411216259
25	8	7.218911171	0.781088829
26	5	7.044388294	-2.044388294
27	6.5	6.588783741	-0.088783741
28	10	7.222722054	2.777277946
29	2	6.205640316	-4.205640316
30	10	7.569694519	2.430305481
31	8	7.220811367	0.779188633
32	6	7.337677956	-1.337677956
33	9	7.740068436	1.259931564
34	5.5	6.257144928	-0.757144928
35	6	7.107849121	-1.107849121
36	7	6.932137489	0.067862511
37	8	7.395069599	0.604930401
38	7	7.222722054	-0.222722054
39	8	7.107849121	0.892150879
40	8	7.103831768	0.896168232
41	8	7.215150833	0.784849167
42	8	7.455840588	0.544159412
43	8	7.103831768	0.896168232

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Neural network output of SP-Quality-Str-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	7.486925125	-0.486925125
2	7.5	7.466047764	0.033952236
3	7	7.484513283	-0.484513283
4	8.5	7.492444992	1.007555008
5	7	7.487079144	-0.487079144
6	8	7.499471188	0.500528812
7	8	7.491823673	0.508176327
8	7.5	7.468344688	0.031655312
9	8	7.492293835	0.507706165
10	7	7.51509428	-0.51509428
11	7	7.514815331	-0.514815331
12	8	7.50110817	0.49889183
13	7	7.521854877	-0.521854877
14	8	7.51347971	0.48652029
15	8	7.460514069	0.539485931
16	7	7.480056286	-0.480056286
17	8	7.450580597	0.549419403
18	7	7.444983482	-0.444983482
19	7	7.39247942	-0.39247942
20	7.5	7.426508427	0.073491573
21	8	7.534034252	0.465965748
22	8	7.472453594	0.527546406
23	6.5	7.477843761	-0.977843761
24	7	7.520367622	-0.520367622
25	8	7.462518215	0.537481785
26	7.5	7.516217709	-0.016217709
27	6	7.515028	-1.515028
28	8	7.49038887	0.50961113
29	4	7.463389397	-3.463389397
30	8	7.478158474	0.521841526
31	9	7.510879517	1.489120483
32	3	7.386620998	-4.386620998
33	9	7.459536076	1.540463924
34	8	7.525063992	0.474936008

Neural network output of SP-Quality-Str-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	7	6.997862816	0.002137184
2	7.5	6.451591015	1.048408985
3	7	7.424017429	-0.424017429
4	8.5	7.31618166	1.18381834
5	7	6.997862816	0.002137184
6	8	7.109656811	0.890343189
7	8	7.636246681	0.363753319
8	7.5	7.725754738	-0.225754738
9	8	7.424017429	0.575982571
10	7	7.220683575	-0.220683575
11	7	7.530752182	-0.530752182
12	8	6.899278164	1.100721836
13	7	7.424017429	-0.424017429
14	8	6.899278164	1.100721836
15	8	7.117440224	0.882559776
16	7	7.530752182	-0.530752182
17	8	7.126521587	0.873478413
18	7	6.899278164	0.100721836
19	7	7.109656811	-0.109656811
20	7.5	6.568792343	0.931207657
21	8	7.725754738	0.274245262
22	8	6.568792343	1.431207657
23	6.5	6.470103264	0.029896736
24	7	6.899278164	0.100721836
25	8	8.01943779	-0.01943779
26	7.5	7.530752182	-0.030752182
27	6	6.802507877	-0.802507877
28	8	8.453778267	-0.453778267
29	4	4.448396206	-0.448396206
30	8	8.624726295	-0.624726295
31	9	7.220683575	1.779316425
32	3	3.824628592	-0.824628592
33	9	7.126521587	1.873478413
34	8	8.540215492	-0.540215492

Neural network output of SP-Quality-BS-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	8	7.979524612	0.020475388
2	8	8.585571289	-0.585571289
3	9	8.160682678	0.839317322
4	8.5	7.783116817	0.716883183
5	7	6.542725563	0.457274437
6	7	7.204779148	-0.204779148
7	7	7.601294994	-0.601294994
8	8	7.714334488	0.285665512
9	8	7.974161148	0.025838852
10	7.5	7.675453663	-0.175453663
11	8	7.411079407	0.588920593
12	7	8.257793427	-1.257793427
13	7.5	7.250877857	0.249122143
14	7	7.839795113	-0.839795113
15	7	6.419110775	0.580889225
16	8	7.79458189	0.20541811
17	7	7.065619469	-0.065619469
18	8	7.882060528	0.117939472
19	8	7.913393497	0.086606503
20	7.5	7.793298721	-0.293298721
21	7.5	7.937598705	-0.437598705
22	7	7.822485924	-0.822485924
23	9	8.593512535	0.406487465
24	4	4.364264488	-0.364264488
25	7	6.565219879	0.434780121
26	4	5.080783844	-1.080783844
27	6	7.588464737	-1.588464737
28	7	7.944947243	-0.944947243
29	8	8.384155273	-0.384155273
30	8	7.545713902	0.454286098
31	8	8.11123848	-0.11123848
32	8	8.124136925	-0.124136925
33	9	8.634008408	0.365991592
34	4	5.235900402	-1.235900402
35	8	7.726762295	0.273237705
36	7	7.84181118	-0.84181118
37	5	6.314057827	-1.314057827
38	7	7.101177216	-0.101177216
39	5	4.83364439	0.16635561
40	9	8.433591843	0.566408157

Neural network output of SP-Quality-BS-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	8	7.326660633	0.673339367
2	8	7.328580856	0.671419144
3	9	7.320888042	1.679111958
4	8.5	7.336240768	1.163759232
5	7	7.34005928	-0.34005928
6	7	7.338150978	-0.338150978
7	7	7.336240768	-0.336240768
8	8	7.334329128	0.665670872
9	8	7.334329128	0.665670872
10	7.5	7.336240768	0.163759232
11	8	7.336240768	0.663759232
12	7	7.332415104	-0.332415104
13	7.5	7.34005928	0.15994072
14	7	7.336240768	-0.336240768
15	7	7.341965199	-0.341965199
16	8	7.336240768	0.663759232
17	7	7.338150978	-0.338150978
18	8	7.334329128	0.665670872
19	8	7.336240768	0.663759232
20	7.5	7.338150978	0.161849022
21	7.5	7.332415104	0.167584896
22	7	7.326660633	-0.326660633
23	9	7.320888042	1.679111958
24	4	7.341965199	-3.341965199
25	7	7.343868732	-0.343868732
26	4	7.347670555	-3.347670555
27	6	7.338150978	-1.338150978
28	7	7.320888042	-0.320888042
29	8	7.332415104	0.667584896
30	8	7.336240768	0.663759232
31	8	7.332415104	0.667584896
32	8	7.336240768	0.663759232
33	9	7.328580856	1.671419144
34	4	7.343868732	-3.343868732
35	8	7.336240768	0.663759232
36	7	7.336240768	-0.336240768
37	5	7.334329128	-2.334329128
38	7	7.328580856	-0.328580856
39	5	7.351464748	-2.351464748
40	9	7.328580856	1.671419144

APPENDIX O

Data for establishing the relationships to explain how site coordination problems affect the performance of subcontractors

Data for survey on forecasting the performance of subcontractors

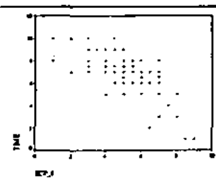
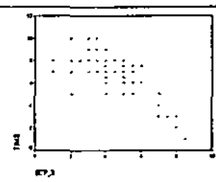
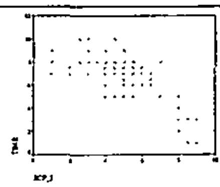
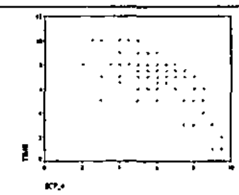
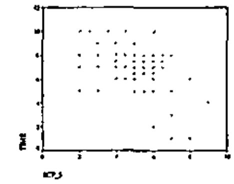
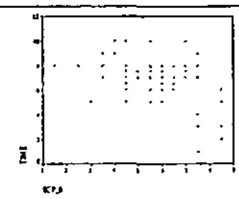
Reply no.	Nature of business	Trade	Time	Quality	Cost	SCP1	SCP2	SCP3	SCP4	SCP5	SCP6
1	sub-contractor	building services work	7.0	8.0	7.5	2.0	4.5	3.0	6.0	5.0	5.5
2	sub-contractor	building services work	8.0	9.0	8.0	1.0	1.0	1.0	2.0	3.0	3.5
3	sub-contractor	structural work	7.0	7.0	7.0	5.0	4.5	5.5	5.0	6.0	3.5
4	sub-contractor	building services work	7.0	8.5	8.0	5.0	3.0	5.0	6.5	5.5	5.5
6	sub-contractor	building services work	7.0	7.0	7.0	5.5	5.0	6.0	5.0	4.0	5.5
7	sub-contractor	finishing work	6.0	7.0	7.5	5.5	5.5	5.0	5.0	6.0	5.5
8	sub-contractor	finishing work	8.0	7.0	8.0	5.0	2.5	4.0	6.0	5.0	7.0
9	sub-contractor	structural work	7.0	7.5	7.0	5.0	5.0	6.0	5.0	6.0	4.5
10	sub-contractor	structural work	7.0	7.0	8.0	5.0	3.0	4.5	5.0	4.5	4.5
12	sub-contractor	building services work	7.0	7.0	7.0	6.0	4.0	5.5	6.0	4.0	5.5
13	sub-contractor	structural work	8.0	8.5	8.0	5.0	4.5	5.0	6.0	5.0	3.5
14	sub-contractor	structural work	7.0	7.0	7.0	3.0	5.0	5.5	6.0	3.0	3.5
15	sub-contractor	structural work	8.0	8.0	7.0	6.0	4.0	5.0	6.5	6.0	4.5
16	sub-contractor	finishing work	7.0	7.0	7.0	5.0	4.0	4.0	6.0	5.0	5.5
17	sub-contractor	finishing work	7.5	7.0	7.5	3.0	5.0	5.0	6.0	6.0	6.0
18	sub-contractor	structural work	8.0	8.0	8.0	5.0	5.5	3.5	7.5	5.5	6.5
19	sub-contractor	finishing work	7.0	7.5	7.0	5.0	3.5	5.0	7.0	4.0	7.0
20	sub-contractor	finishing work	6.0	7.0	8.0	5.0	4.0	5.5	6.0	6.0	5.5
21	sub-contractor	structural work	7.0	7.5	7.5	5.5	5.0	4.0	6.0	5.0	4.5
22	sub-contractor	finishing work	6.0	7.0	6.0	6.0	5.0	5.0	6.0	5.0	5.5
23	sub-contractor	structural work	8.0	8.0	8.0	5.0	3.5	4.5	5.0	5.5	4.5
24	sub-contractor	building services work	7.0	7.0	7.0	5.5	5.0	5.0	6.0	5.0	6.0
25	sub-contractor	finishing work	7.0	7.0	7.0	6.0	5.0	4.0	6.5	4.0	5.5
26	sub-contractor	finishing work	6.0	7.5	7.0	5.0	5.0	5.0	5.5	4.0	5.5
27	sub-contractor	structural work	7.0	7.0	7.0	5.0	5.5	4.5	8.0	6.0	5.5
28	sub-contractor	building services work	7.5	8.0	8.0	5.0	4.0	4.5	5.5	5.5	5.0
29	sub-contractor	structural work	7.0	7.0	7.0	4.5	4.0	4.0	6.0	6.0	5.5
30	sub-contractor	structural work	7.5	8.0	8.0	5.0	5.5	5.0	7.0	6.5	5.5
31	sub-contractor	structural work	7.0	7.0	7.5	5.0	5.0	4.5	7.0	6.5	4.5
32	sub-contractor	finishing work	7.0	7.5	8.0	6.0	5.5	5.0	6.0	5.0	6.0
33	sub-contractor	finishing work	7.0	7.0	7.0	4.0	4.5	4.5	5.0	5.0	5.5
35	sub-contractor	finishing work	6.5	7.0	7.0	5.0	5.0	5.0	6.5	6.0	6.0
36	sub-contractor	structural work	7.5	8.0	8.0	4.5	4.0	5.0	7.0	5.0	5.5
37	sub-contractor	building services work	7.0	8.0	7.0	6.0	5.0	4.5	6.5	6.0	6.5
38	sub-contractor	structural work	7.5	8.0	8.0	5.0	4.0	4.5	5.0	5.0	6.0
39	sub-contractor	building services work	7.0	7.5	7.5	5.0	5.0	5.0	6.0	6.0	6.0
40	sub-contractor	building services work	7.0	8.0	7.5	7.0	4.0	5.0	6.0	5.0	6.0
41	sub-contractor	structural work	7.5	7.0	7.0	4.0	5.5	4.0	6.0	5.0	5.5
42	sub-contractor	building services work	6.0	7.0	7.0	5.0	5.0	4.0	7.0	5.0	6.0
43	sub-contractor	finishing work	7.0	7.0	7.5	5.0	4.5	5.5	5.5	5.5	5.0
44	sub-contractor	building services work	7.5	7.5	7.5	5.0	4.0	6.0	7.5	6.0	5.5
45	sub-contractor	structural work	7.0	8.0	8.0	5.0	5.0	4.0	6.0	5.0	7.5
46	sub-contractor	structural work	7.0	7.0	6.5	5.0	4.5	5.0	5.0	4.5	5.5
47	sub-contractor	building services work	7.5	7.0	7.0	4.0	4.0	5.0	6.0	5.0	5.5
48	sub-contractor	building services work	6.5	7.0	7.0	6.0	4.0	6.5	6.0	5.5	6.5
49	sub-contractor	building services work	7.5	8.0	7.5	5.5	5.5	5.0	7.0	5.0	6.0
50	sub-contractor	building services work	7.0	7.0	7.0	6.5	5.0	5.5	6.0	4.5	5.5
51	sub-contractor	structural work	6.5	7.0	7.5	7.0	5.0	5.0	4.0	5.0	4.5
52	sub-contractor	structural work	7.5	7.5	8.0	5.0	6.0	5.5	6.0	4.0	5.5
53	sub-contractor	finishing work	7.0	7.0	7.0	4.0	5.0	6.5	5.5	5.5	5.5
54	sub-contractor	structural work	7.5	8.0	7.5	4.0	5.0	4.0	6.5	6.5	4.5
55	sub-contractor	finishing work	8.0	7.0	7.0	5.5	4.5	5.0	4.5	4.0	3.5
56	sub-contractor	finishing work	6.0	7.5	7.0	6.5	4.0	6.0	6.0	4.5	8.5
57	sub-contractor	building services work	7.0	8.0	8.0	5.5	4.5	4.5	6.0	5.0	6.0
58	sub-contractor	structural work	7.5	8.0	6.5	5.0	5.0	5.5	6.5	5.0	5.5
59	sub-contractor	structural work	7.0	6.5	7.5	5.0	4.0	5.0	7.5	4.0	7.5
60	sub-contractor	structural work	7.0	7.0	7.0	4.5	4.0	5.0	6.5	6.0	5.5
62	sub-contractor	building services work	7.5	8.0	8.0	5.0	5.0	5.0	6.5	5.0	7.0
63	sub-contractor	building services work	7.0	7.5	7.0	5.0	4.0	5.5	6.5	5.0	7.0
64	sub-contractor	structural work	8.0	8.0	8.0	5.0	5.0	3.0	4.0	7.0	6.0
65	sub-contractor	building services work	7.0	7.5	7.0	4.5	5.5	4.0	5.5	5.0	6.5
67	sub-contractor	building services work	8.0	7.0	6.0	5.0	5.0	2.5	5.5	3.0	7.5
73	sub-contractor	finishing work	10.0	7.5	8.0	3.0	3.5	3.0	4.5	2.0	4.0
80	sub-contractor	finishing work	6.0	6.0	3.0	4.5	5.0	5.0	7.0	5.0	4.5
82	sub-contractor	finishing work	3.0	7.5	7.5	7.0	7.5	8.5	8.0	7.0	7.5
85	sub-contractor	building services work	9.0	9.0	8.0	4.0	4.0	1.0	5.0	4.0	7.5
87	sub-contractor	building services work	6.0	4.0	5.0	7.0	4.0	6.5	8.5	8.0	5.5
90	sub-contractor	building services work	5.0	7.0	5.0	7.0	5.0	7.0	6.0	5.0	8.5
97	sub-contractor	building services work	5.0	4.0	3.0	6.0	5.0	8.0	6.0	5.0	6.0
98	sub-contractor	building services work	7.0	6.0	5.0	5.0	5.0	5.5	6.0	5.5	7.0
100	sub-contractor	finishing work	8.0	9.0	8.0	4.0	4.0	5.5	5.0	5.5	4.5
101	sub-contractor	building services work	7.0	7.0	8.0	2.0	1.0	1.0	3.0	2.0	3.5

102	sub-contractor	finishing work	5.0	8.0	5.0	5.0	5.0	5.0	8.5	2.0	5.5
103	sub-contractor	finishing work	8.0	8.0	7.0	4.0	4.5	7.0	5.5	5.0	6.0
104	sub-contractor	finishing work	10.0	9.0	10.0	2.0	2.0	3.0	3.0	2.5	4.0
105	sub-contractor	finishing work	5.0	7.0	6.0	7.0	7.0	4.0	7.5	5.5	5.5
106	sub-contractor	building services work	7.0	8.0	7.0	4.0	3.0	4.0	6.0	5.0	5.5
107	sub-contractor	building services work	8.0	8.0	8.0	6.0	3.0	5.0	6.5	5.5	5.5
108	sub-contractor	structural work	8.0	7.5	7.0	3.0	3.0	4.0	4.5	5.0	5.5
109	sub-contractor	building services work	7.0	8.0	8.0	6.0	5.0	4.0	6.5	5.0	6.5
110	sub-contractor	finishing work	7.0	8.0	5.0	7.0	3.0	6.5	6.0	2.0	4.5
111	sub-contractor	finishing work	7.0	5.0	5.0	5.0	4.0	5.5	6.5	6.0	4.5
113	sub-contractor	finishing work	3.0	6.5	3.5	7.0	7.0	8.0	7.5	7.0	7.5
118	sub-contractor	finishing work	8.0	10.0	9.0	3.0	4.0	4.5	5.0	5.0	1.5
125	sub-contractor	finishing work	1.0	2.0	3.0	9.0	8.5	8.5	9.5	8.0	7.5
133	sub-contractor	building services work	7.0	8.0	7.0	5.0	5.5	5.0	8.0	6.0	6.0
135	sub-contractor	structural work	8.0	6.0	7.0	4.0	4.5	4.5	7.0	6.0	7.5
137	sub-contractor	finishing work	8.0	10.0	10.0	4.0	2.0	3.5	4.0	2.0	3.5
138	sub-contractor	finishing work	9.0	8.0	7.0	5.0	3.5	5.0	5.5	3.0	3.5
139	sub-contractor	finishing work	8.0	6.0	6.0	3.0	3.0	4.0	5.0	4.0	3.5
140	sub-contractor	structural work	7.0	8.0	9.9	5.0	2.0	3.0	4.0	4.0	3.5
142	sub-contractor	building services work	9.0	9.0	7.0	3.5	3.0	3.0	6.0	5.0	4.0
143	sub-contractor	building services work	5.0	4.0	4.0	8.0	4.0	7.0	8.0	7.0	8.5
144	sub-contractor	building services work	7.5	8.0	6.0	5.0	4.0	5.0	7.0	4.0	4.5
145	sub-contractor	building services work	6.0	7.0	5.0	5.0	6.0	5.0	8.0	8.0	6.5
146	sub-contractor	finishing work	8.0	9.0	6.0	3.0	1.0	5.0	3.5	6.5	6.5
147	sub-contractor	finishing work	2.0	5.5	5.5	6.5	8.0	8.0	9.5	6.0	8.5
148	sub-contractor	structural work	4.0	4.0	8.0	7.5	7.0	8.0	8.5	9.0	7.5
149	sub-contractor	building services work	5.0	5.0	5.0	4.0	2.0	4.5	3.0	3.0	3.0
150	sub-contractor	finishing work	5.0	6.0	5.0	5.0	5.0	5.0	5.0	2.0	5.5
152	sub-contractor	building services work	8.0	7.0	8.0	5.0	5.0	3.0	7.0	2.0	2.5
153	sub-contractor	finishing work	5.0	7.0	7.0	5.0	5.5	5.5	6.0	7.0	5.5
154	sub-contractor	structural work	7.5	8.0	5.0	4.0	5.0	2.0	5.0	5.0	5.5
156	sub-contractor	finishing work	8.0	8.0	5.0	4.0	2.5	4.5	5.0	5.0	5.5
161	sub-contractor	finishing work	7.0	7.0	7.0	4.0	4.0	5.0	5.0	5.5	5.5
166	sub-contractor	building services work	3.0	5.0	5.0	8.0	8.0	9.0	9.0	7.0	8.5
169	sub-contractor	building services work	10.0	9.0	9.0	3.0	3.0	3.0	4.0	4.5	7.0
170	sub-contractor	structural work	10.0	9.0	7.0	4.5	3.0	4.5	5.0	6.0	5.5
181	sub-contractor	finishing work	5.0	8.0	7.0	5.0	5.0	5.0	5.0	6.0	4.5
182	sub-contractor	finishing work	9.0	8.0	7.0	4.5	4.0	4.0	6.0	4.0	3.5
183	sub-contractor	structural work	1.0	3.0	5.0	8.5	8.5	9.0	9.0	7.0	7.5
186	sub-contractor	finishing work	7.0	8.0	7.0	4.5	2.0	2.0	7.0	6.0	4.5
187	sub-contractor	finishing work	9.0	8.0	8.0	3.0	3.0	4.0	4.0	4.0	3.5
188	sub-contractor	finishing work	7.0	8.0	7.0	3.0	4.0	2.0	6.0	5.5	4.5
190	sub-contractor	structural work	7.0	9.0	7.0	2.0	4.5	4.0	3.0	5.0	7.5
194	sub-contractor	structural work	10.0	8.0	7.0	1.0	2.0	2.5	2.5	3.5	4.5
197	sub-contractor	building services work	8.0	8.0	8.0	7.0	1.0	3.0	6.0	4.5	7.5

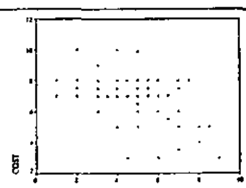
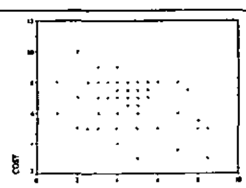
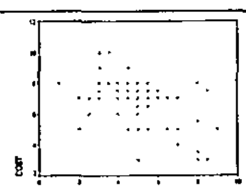
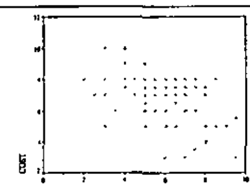
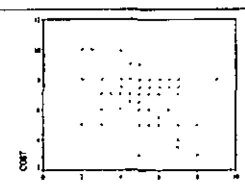
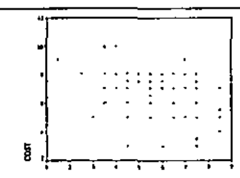
APPENDIX P

Scatterplot matrix for site coordination problems analysis

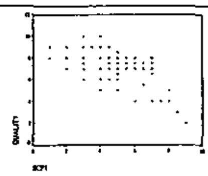
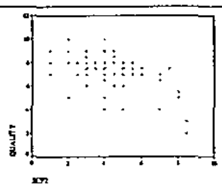
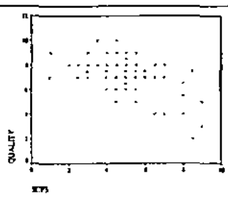
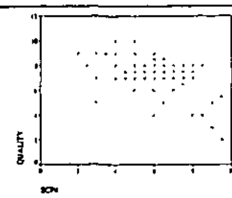
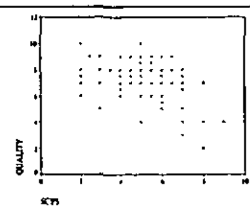
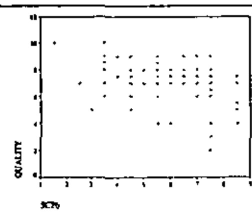
Scatterplot matrix for SP-Time-All model

Dependent variable	Independent variable	Scatterplot
Time	SCP1	
Time	SCP2	
Time	SCP3	
Time	SCP4	
Time	SCP5	
Time	SCP6	

Scatterplot matrix for SP-Cost-All model

Dependent variable	Independent variable	Scatter plot
Cost	SCP1	
Cost	SCP2	
Cost	SCP3	
Cost	SCP4	
Cost	SCP5	
Cost	SCP6	

Scatterplot matrix for SP-Quality-All model

Dependent variable	Independent variable	Scatter plot
Quality	SCP 1	
Quality	SCP2	
Quality	SCP3	
Quality	SCP4	
Quality	SCP5	
Quality	SCP6	

APPENDIX Q

SPSS regression printouts for the causes to the site coordination problems analysis

SPSS regression printouts for SCP1 analysis

Correlations

		CAUSE10	CAUSE11	CAUSE12
Pearson Correlation	SCP1	.297	.317	.118
	CAUSE1	.308	.361	.247
	CAUSE2	.352	.404	.130
	CAUSE3	.334	.352	.204
	CAUSE4	.479	.428	.172
	CAUSE5	.435	.323	.157
	CAUSE6	.288	.293	.288
	CAUSE7	.275	.488	.263
	CAUSE8	.448	.646	.408
	CAUSE9	.411	.637	.351
	CAUSE10	1.000	.582	.397
	CAUSE11	.582	1.000	.471
	CAUSE12	.397	.471	1.000
Sig. (1-tailed)	SCP1	.000	.000	.050
	CAUSE1	.000	.000	.000
	CAUSE2	.000	.000	.035
	CAUSE3	.000	.000	.002
	CAUSE4	.000	.000	.008
	CAUSE5	.000	.000	.014
	CAUSE6	.000	.000	.000
	CAUSE7	.000	.000	.000
	CAUSE8	.000	.000	.000
	CAUSE9	.000	.000	.000
	CAUSE10	.	.000	.000
	CAUSE11	.000	.	.000
	CAUSE12	.000	.000	.
N	SCP1	195	195	195
	CAUSE1	195	195	195
	CAUSE2	195	195	195
	CAUSE3	195	195	195
	CAUSE4	195	195	195
	CAUSE5	195	195	195
	CAUSE6	195	195	195
	CAUSE7	195	195	195
	CAUSE8	195	195	195
	CAUSE9	195	195	195
	CAUSE10	195	195	195
	CAUSE11	195	195	195
	CAUSE12	195	195	195

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4[a]	.	Enter
2	.	CAUSE8	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE12	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE11	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE3	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE9	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP1-AR

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP1	5.082	1.5157	195
CAUSE1	6.138	1.9939	195
CAUSE2	5.567	1.9872	195
CAUSE3	5.644	2.0013	195
CAUSE4	5.638	2.0259	195
CAUSE5	5.505	1.9955	195
CAUSE6	5.123	1.9412	195
CAUSE7	5.269	2.0321	195
CAUSE8	6.169	1.9277	195
CAUSE9	6.292	2.1869	195
CAUSE10	5.936	1.7753	195
CAUSE11	5.323	2.0137	195
CAUSE12	5.621	1.9562	195

Analysis for Ca-SCP1-AR

Correlations

		SCP1	CAUSE1	CAUSE2	CAUSE3	CAUSE4	CAUSE5	CAUSE6	CAUSE7	CAUSE8	CAUSE9
Pearson Correlation	SCP1	1.000	.462	.540	.394	.486	.426	.293	.363	.311	.234
	CAUSE1	.462	1.000	.757	.568	.564	.548	.497	.399	.466	.415
	CAUSE2	.540	.757	1.000	.636	.706	.600	.461	.420	.440	.336
	CAUSE3	.394	.568	.636	1.000	.638	.583	.477	.471	.373	.367
	CAUSE4	.486	.564	.706	.638	1.000	.732	.462	.427	.384	.308
	CAUSE5	.426	.548	.600	.583	.732	1.000	.568	.318	.371	.229
	CAUSE6	.293	.497	.461	.477	.462	.568	1.000	.502	.443	.360
	CAUSE7	.363	.399	.420	.471	.427	.318	.502	1.000	.566	.472
	CAUSE8	.311	.466	.440	.373	.384	.371	.443	.566	1.000	.634
	CAUSE9	.234	.415	.336	.367	.308	.229	.360	.472	.634	1.000
	CAUSE10	.297	.308	.352	.334	.479	.435	.288	.275	.448	.411
	CAUSE11	.317	.361	.404	.352	.428	.323	.293	.488	.646	.637
	CAUSE12	.118	.247	.130	.204	.172	.157	.288	.263	.408	.351
Sig. (1-tailed)	SCP1	.	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE5	.000	.000	.000	.000	.000	.	.000	.000	.000	.001
	CAUSE6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE9	.000	.000	.000	.000	.000	.001	.000	.000	.000	.
	CAUSE10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE12	.050	.000	.035	.002	.008	.014	.000	.000	.000	.000
N	SCP1	195	195	195	195	195	195	195	195	195	195
	CAUSE1	195	195	195	195	195	195	195	195	195	195
	CAUSE2	195	195	195	195	195	195	195	195	195	195
	CAUSE3	195	195	195	195	195	195	195	195	195	195
	CAUSE4	195	195	195	195	195	195	195	195	195	195
	CAUSE5	195	195	195	195	195	195	195	195	195	195
	CAUSE6	195	195	195	195	195	195	195	195	195	195
	CAUSE7	195	195	195	195	195	195	195	195	195	195
	CAUSE8	195	195	195	195	195	195	195	195	195	195
	CAUSE9	195	195	195	195	195	195	195	195	195	195
	CAUSE10	195	195	195	195	195	195	195	195	195	195

Model		Sum of Squares	df	Mean Square	F	Sig.
	Total	445.687	194			
5	Regression	151.923	8	18.990	12.024	.000[e]
	Residual	293.764	186	1.579		
	Total	445.687	194			
6	Regression	151.589	7	21.656	13.770	.000[f]
	Residual	294.098	187	1.573		
	Total	445.687	194			
7	Regression	150.557	6	25.093	15.984	.000[g]
	Residual	295.130	188	1.570		
	Total	445.687	194			
8	Regression	149.085	5	29.817	19.000	.000[h]
	Residual	296.602	189	1.569		
	Total	445.687	194			
9	Regression	147.805	4	36.951	23.569	.000[i]
	Residual	297.883	190	1.568		
	Total	445.687	194			
10	Regression	146.239	3	48.746	31.092	.000[j]
	Residual	299.448	191	1.568		
	Total	445.687	194			

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE11, CAUSE1, CAUSE4
c. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE11, CAUSE1, CAUSE4
d. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE1, CAUSE4
e. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE5, CAUSE1, CAUSE4
f. Predictors: (Constant), CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE5, CAUSE1, CAUSE4
g. Predictors: (Constant), CAUSE2, CAUSE6, CAUSE7, CAUSE5, CAUSE1, CAUSE4
h. Predictors: (Constant), CAUSE2, CAUSE6, CAUSE7, CAUSE5, CAUSE4
i. Predictors: (Constant), CAUSE2, CAUSE7, CAUSE5, CAUSE4
j. Predictors: (Constant), CAUSE2, CAUSE7, CAUSE4
k. Dependent Variable: SCP1

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	2.115	.417		5.068	.000	1.292	2.939			
	CAUSE1	8.564E-02	.076	.113	1.122	.264	-.065	.236	.462	.083	.067
	CAUSE2	.223	.086	.293	2.591	.010	.053	.393	.540	.189	.156
	CAUSE3	-2.577E-02	.067	-.034	-.383	.702	-.159	.107	.394	-.028	-.023
	CAUSE4	7.337E-02	.081	.098	.904	.367	-.087	.234	.486	.067	.054
	CAUSE5	7.711E-02	.077	.102	.998	.319	-.075	.230	.426	.074	.060
	CAUSE6	-5.423E-02	.066	-.069	-.823	.411	-.184	.076	.293	-.061	-.049
	CAUSE7	.126	.062	.168	2.011	.046	.002	.249	.363	.147	.121
	CAUSE8	-1.743E-02	.074	-.022	-.235	.814	-.164	.129	.311	-.017	-.014
	CAUSE9	-2.819E-02	.061	-.041	-.459	.647	-.149	.093	.234	-.034	-.028
	CAUSE10	5.084E-02	.070	.060	.730	.466	-.087	.188	.297	.054	.044
	CAUSE11	3.709E-02	.075	.049	.496	.620	-.110	.185	.317	.037	.030
	CAUSE12	-1.644E-02	.057	-.021	-.290	.772	-.128	.096	.118	-.021	-.017
2	(Constant)	2.105	.414		5.085	.000	1.288	2.921			
	CAUSE1	8.431E-02	.076	.111	1.110	.268	-.066	.234	.462	.082	.067
	CAUSE2	.221	.086	.290	2.587	.010	.053	.390	.540	.188	.155
	CAUSE3	-2.426E-02	.067	-.032	-.363	.717	-.156	.108	.394	-.027	-.022
	CAUSE4	7.537E-02	.081	.101	.936	.351	-.084	.234	.486	.069	.056
	CAUSE5	7.511E-02	.077	.099	.981	.328	-.076	.226	.426	.072	.059
	CAUSE6	-5.529E-02	.066	-.071	-.844	.400	-.185	.074	.293	-.062	-.051
	CAUSE7	.122	.060	.163	2.025	.044	.003	.241	.363	.148	.121
	CAUSE9	-3.231E-02	.059	-.047	-.550	.583	-.148	.084	.234	-.041	-.033
	CAUSE10	4.983E-02	.069	.058	.719	.473	-.087	.187	.297	.053	.043
	CAUSE11	3.299E-02	.072	.044	.455	.650	-.110	.176	.317	.034	.027
	CAUSE12	-1.790E-02	.056	-.023	-.318	.751	-.129	.093	.118	-.024	-.019
3	(Constant)	2.067	.395		5.230	.000	1.287	2.846			
	CAUSE1	8.021E-02	.075	.106	1.074	.284	-.067	.228	.462	.079	.064
	CAUSE2	.226	.084	.297	2.700	.008	.061	.392	.540	.195	.161
	CAUSE3	-2.561E-02	.067	-.034	-.385	.701	-.157	.106	.394	-.028	-.023
	CAUSE4	7.650E-02	.080	.102	.953	.342	-.082	.235	.486	.070	.057
	CAUSE5	7.727E-02	.076	.102	1.016	.311	-.073	.227	.426	.075	.061
	CAUSE6	-5.913E-02	.064	-.076	-.920	.359	-.186	.068	.293	-.068	-.055
	CAUSE7	.122	.060	.164	2.036	.043	.004	.241	.363	.148	.122
	CAUSE9	-3.182E-02	.059	-.046	-.543	.587	-.147	.084	.234	-.040	-.032
	CAUSE10	4.549E-02	.068	.053	.671	.503	-.088	.179	.297	.049	.040
	CAUSE11	2.636E-02	.069	.035	.381	.704	-.110	.163	.317	.028	.023

Model	Variables Entered	Variables Removed	Method
	.	CAUSE10	(criterion: Probability of F-to-remove >= .100).
8	.	CAUSE1	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE6	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE5	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP1

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.585[a]	.343	.299	1.2688	.343	7.903	12	182	.000
2	.585[b]	.342	.303	1.2656	.000	.055	1	184	.814
3	.585[c]	.342	.306	1.2625	.000	.101	1	185	.751
4	.584[d]	.341	.309	1.2595	-.001	.145	1	186	.704
5	.584[e]	.341	.313	1.2567	-.001	.171	1	187	.679
6	.583[f]	.340	.315	1.2541	-.001	.211	1	188	.646
7	.581[g]	.338	.317	1.2529	-.002	.656	1	189	.419
8	.578[h]	.335	.317	1.2527	-.003	.937	1	190	.334
9	.576[i]	.332	.318	1.2521	-.003	.816	1	191	.367
10	.573[j]	.328	.318	1.2521	-.004	.999	1	192	.319

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE11, CAUSE1, CAUSE4
c. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE11, CAUSE1, CAUSE4
d. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE1, CAUSE4
e. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE5, CAUSE1, CAUSE4
f. Predictors: (Constant), CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE5, CAUSE1, CAUSE4
g. Predictors: (Constant), CAUSE2, CAUSE6, CAUSE7, CAUSE5, CAUSE1, CAUSE4
h. Predictors: (Constant), CAUSE2, CAUSE6, CAUSE7, CAUSE5, CAUSE4
i. Predictors: (Constant), CAUSE2, CAUSE7, CAUSE5, CAUSE4
j. Predictors: (Constant), CAUSE2, CAUSE7, CAUSE4
k. Dependent Variable: SCP1

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	152.677	12	12.723	7.903	.000[a]
	Residual	293.010	182	1.610		
	Total	445.687	194			
2	Regression	152.588	11	13.872	8.661	.000[b]
	Residual	293.099	183	1.602		
	Total	445.687	194			
3	Regression	152.426	10	15.243	9.564	.000[c]
	Residual	293.261	184	1.594		
	Total	445.687	194			

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	CAUSE1	.358	2.793
	CAUSE2	.283	3.530
	CAUSE3	.457	2.186
	CAUSE4	.307	3.261
	CAUSE5	.349	2.862
	CAUSE6	.508	1.970
	CAUSE7	.515	1.942
	CAUSE8	.406	2.462
	CAUSE9	.460	2.174
	CAUSE10	.543	1.842
	CAUSE11	.366	2.730
	CAUSE12	.674	1.485
2	(Constant)		
	CAUSE1	.360	2.777
	CAUSE2	.286	3.501
	CAUSE3	.462	2.166
	CAUSE4	.310	3.225
	CAUSE5	.354	2.828
	CAUSE6	.510	1.961
	CAUSE7	.553	1.810
	CAUSE9	.501	1.997
	CAUSE10	.545	1.835
	CAUSE11	.387	2.581
	CAUSE12	.682	1.467
3	(Constant)		
	CAUSE1	.371	2.697
	CAUSE2	.296	3.380
	CAUSE3	.464	2.157
	CAUSE4	.311	3.219
	CAUSE5	.356	2.806
	CAUSE6	.528	1.894
	CAUSE7	.553	1.809
	CAUSE9	.501	1.996
	CAUSE10	.567	1.764
	CAUSE11	.422	2.368

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
4	(Constant)	2.056	.393		5.229	.000	1.280	2.832			
	CAUSE1	7.864E-02	.074	.103	1.057	.292	-.068	.225	.462	.078	.063
	CAUSE2	.230	.083	.302	2.768	.006	.066	.394	.540	.199	.165
	CAUSE3	-2.741E-02	.066	-.036	-.414	.679	-.158	.103	.394	-.030	-.025
	CAUSE4	7.812E-02	.080	.104	.977	.330	-.080	.236	.486	.072	.058
	CAUSE5	7.762E-02	.076	.102	1.023	.308	-.072	.227	.426	.075	.061
	CAUSE6	-6.187E-02	.064	-.079	-.971	.333	-.188	.064	.293	-.071	-.058
	CAUSE7	.128	.058	.171	2.205	.029	.013	.242	.363	.160	.132
	CAUSE9	-2.181E-02	.052	-.031	-.418	.677	-.125	.081	.234	-.031	-.025
	CAUSE10	5.561E-02	.062	.065	.894	.373	-.067	.178	.297	.066	.053
5	(Constant)	2.042	.391		5.224	.000	1.271	2.813			
	CAUSE1	7.643E-02	.074	.101	1.033	.303	-.070	.222	.462	.075	.061
	CAUSE2	.224	.082	.294	2.744	.007	.063	.385	.540	.197	.163
	CAUSE4	7.209E-02	.078	.096	.919	.359	-.083	.227	.486	.067	.055
	CAUSE5	7.300E-02	.075	.096	.975	.331	-.075	.221	.426	.071	.058
	CAUSE6	-6.313E-02	.063	-.081	-.994	.321	-.188	.062	.293	-.073	-.059
	CAUSE7	.124	.057	.166	2.171	.031	.011	.236	.363	.157	.129
	CAUSE9	-2.384E-02	.052	-.034	-.460	.646	-.126	.078	.234	-.034	-.027
	CAUSE10	5.666E-02	.062	.066	.913	.362	-.066	.179	.297	.067	.054
6	(Constant)	2.013	.385		5.229	.000	1.254	2.773			
	CAUSE1	6.881E-02	.072	.091	.956	.340	-.073	.211	.462	.070	.057
	CAUSE2	.225	.081	.295	2.768	.006	.065	.386	.540	.198	.164
	CAUSE4	7.249E-02	.078	.097	.926	.356	-.082	.227	.486	.068	.055
	CAUSE5	7.775E-02	.074	.102	1.050	.295	-.068	.224	.426	.077	.062
	CAUSE6	-6.605E-02	.063	-.085	-1.048	.296	-.190	.058	.293	-.076	-.062
	CAUSE7	.116	.054	.156	2.135	.034	.009	.223	.363	.154	.127
	CAUSE10	4.749E-02	.059	.056	.810	.419	-.068	.163	.297	.059	.048
7	(Constant)	2.162	.338		6.390	.000	1.494	2.829			
	CAUSE1	6.963E-02	.072	.092	.968	.334	-.072	.211	.462	.070	.057
	CAUSE2	.224	.081	.293	2.751	.007	.063	.384	.540	.197	.163
	CAUSE4	8.601E-02	.076	.115	1.126	.262	-.065	.237	.486	.082	.067
	CAUSE5	8.549E-02	.073	.113	1.166	.245	-.059	.230	.426	.085	.069
	CAUSE6	-6.616E-02	.063	-.085	-1.050	.295	-.190	.058	.293	-.076	-.062
	CAUSE7	.120	.054	.161	2.211	.028	.013	.227	.363	.159	.131

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE1	.372	2.689
	CAUSE2	.300	3.336
	CAUSE3	.466	2.146
	CAUSE4	.312	3.210
	CAUSE5	.356	2.805
	CAUSE6	.535	1.870
	CAUSE7	.589	1.697
	CAUSE9	.628	1.593
	CAUSE10	.670	1.492
5	(Constant)		
	CAUSE1	.374	2.675
	CAUSE2	.309	3.233
	CAUSE4	.322	3.103
	CAUSE5	.364	2.745
	CAUSE6	.536	1.866
	CAUSE7	.606	1.650
	CAUSE9	.633	1.579
	CAUSE10	.671	1.490
6	(Constant)		
	CAUSE1	.393	2.541
	CAUSE2	.310	3.228
	CAUSE4	.322	3.103
	CAUSE5	.371	2.692
	CAUSE6	.541	1.847
	CAUSE7	.663	1.508
	CAUSE10	.749	1.336
7	(Constant)		
	CAUSE1	.394	2.541
	CAUSE2	.310	3.227
	CAUSE4	.338	2.962
	CAUSE5	.378	2.647
	CAUSE6	.541	1.847
	CAUSE7	.669	1.497

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
8	(Constant)	2.250	.326		6.905	.000	1.607	2.892			
	CAUSE2	.269	.066	.353	4.055	.000	.138	.400	.540	.283	.241
	CAUSE4	8.206E-02	.076	.110	1.076	.283	-.068	.233	.486	.078	.064
	CAUSE5	9.280E-02	.073	.122	1.272	.205	-.051	.237	.426	.092	.075
	CAUSE6	-5.611E-02	.062	-.072	-.903	.367	-.179	.066	.293	-.066	-.054
	CAUSE7	.123	.054	.165	2.275	.024	.016	.230	.363	.163	.135
9	(Constant)	2.203	.322		6.851	.000	1.569	2.837			
	CAUSE2	.263	.066	.345	3.987	.000	.133	.394	.540	.278	.236
	CAUSE4	8.794E-02	.076	.118	1.157	.249	-.062	.238	.486	.084	.069
	CAUSE5	6.707E-02	.067	.088	.999	.319	-.065	.199	.426	.072	.059
	CAUSE7	.104	.050	.139	2.090	.038	.006	.202	.363	.150	.124
10	(Constant)	2.284	.311		7.341	.000	1.670	2.898			
	CAUSE2	.275	.065	.360	4.227	.000	.147	.403	.540	.292	.251
	CAUSE4	.129	.064	.172	2.012	.046	.003	.255	.486	.144	.119
	CAUSE7	.103	.050	.138	2.066	.040	.005	.201	.363	.148	.123

	CAUSE_1	.595	1.000	.850	.628	.625	.540	.224	.433	.436	.416
	CAUSE_2	.597	.850	1.000	.622	.759	.595	.164	.564	.530	.543
	CAUSE_3	.474	.628	.622	1.000	.598	.633	.211	.426	.379	.350
	CAUSE_4	.597	.625	.759	.598	1.000	.785	.285	.548	.447	.549
	CAUSE_5	.509	.540	.595	.633	.785	1.000	.274	.378	.389	.396
	CAUSE_6	.084	.224	.164	.211	.285	.274	1.000	.282	.234	.159
	CAUSE_7	.424	.433	.564	.426	.548	.378	.282	1.000	.694	.552
	CAUSE_8	.308	.436	.530	.379	.447	.389	.234	.694	1.000	.784
	CAUSE_9	.329	.416	.543	.350	.549	.396	.159	.552	.784	1.000
	CAUSE_10	.141	.253	.309	.185	.359	.327	.086	.393	.664	.694
	CAUSE_11	.276	.341	.456	.217	.400	.340	.044	.524	.797	.760
	CAUSE_12	-.015	.248	.108	.092	.088	.168	.099	.110	.396	.372
Sig. (1-tailed)	SCPI	.	.000	.000	.000	.000	.000	.272	.001	.011	.007
	CAUSE_1	.000	.	.000	.000	.000	.000	.050	.000	.000	.001
	CAUSE_2	.000	.000	.	.000	.000	.000	.116	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.061	.001	.002	.004
	CAUSE_4	.000	.000	.000	.000	.	.000	.017	.000	.000	.000
	CAUSE_5	.000	.000	.000	.000	.000	.	.022	.002	.002	.001
	CAUSE_6	.272	.050	.116	.061	.017	.022	.	.019	.043	.123
	CAUSE_7	.001	.000	.000	.001	.000	.002	.019	.	.000	.000
	CAUSE_8	.011	.000	.000	.002	.000	.002	.043	.000	.	.000
	CAUSE_9	.007	.001	.000	.004	.000	.001	.123	.000	.000	.
	CAUSE_10	.153	.031	.011	.088	.004	.007	.267	.001	.000	.000
	CAUSE_11	.021	.005	.000	.056	.001	.006	.375	.000	.000	.000
	CAUSE_12	.456	.034	.217	.251	.263	.110	.236	.212	.001	.003
N	SCPI	55	55	55	55	55	55	55	55	55	55
	CAUSE_1	55	55	55	55	55	55	55	55	55	55
	CAUSE_2	55	55	55	55	55	55	55	55	55	55
	CAUSE_3	55	55	55	55	55	55	55	55	55	55
	CAUSE_4	55	55	55	55	55	55	55	55	55	55
	CAUSE_5	55	55	55	55	55	55	55	55	55	55
	CAUSE_6	55	55	55	55	55	55	55	55	55	55
	CAUSE_7	55	55	55	55	55	55	55	55	55	55
	CAUSE_8	55	55	55	55	55	55	55	55	55	55
	CAUSE_9	55	55	55	55	55	55	55	55	55	55
	CAUSE_10	55	55	55	55	55	55	55	55	55	55
	CAUSE_11	55	55	55	55	55	55	55	55	55	55
	CAUSE_12	55	55	55	55	55	55	55	55	55	55

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCPI	.141	.276	-.015
	CAUSE_1	.253	.341	.248
	CAUSE_2	.309	.456	.108
	CAUSE_3	.185	.217	.092
	CAUSE_4	.359	.400	.088
	CAUSE_5	.327	.340	.168
	CAUSE_6	.086	.044	.099
	CAUSE_7	.393	.524	.110
	CAUSE_8	.664	.797	.396
	CAUSE_9	.694	.760	.372
	CAUSE_10	1.000	.724	.544
	CAUSE_11	.724	1.000	.370
	CAUSE_12	.544	.370	1.000
Sig. (1-tailed)	SCPI	.153	.021	.456
	CAUSE_1	.031	.005	.034
	CAUSE_2	.011	.000	.217
	CAUSE_3	.088	.056	.251
	CAUSE_4	.004	.001	.263
	CAUSE_5	.007	.006	.110
	CAUSE_6	.267	.375	.236
	CAUSE_7	.001	.000	.212
	CAUSE_8	.000	.000	.001
	CAUSE_9	.000	.000	.003
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.003
	CAUSE_12	.000	.003	.
N	SCPI	55	55	55
	CAUSE_1	55	55	55
	CAUSE_2	55	55	55
	CAUSE_3	55	55	55
	CAUSE_4	55	55	55
	CAUSE_5	55	55	55
	CAUSE_6	55	55	55
	CAUSE_7	55	55	55
	CAUSE_8	55	55	55
	CAUSE_9	55	55	55
	CAUSE_10	55	55	55
	CAUSE_11	55	55	55
	CAUSE_12	55	55	55

8	(Constant)		
	CAUSE2	.465	2.151
	CAUSE4	.339	2.953
	CAUSE5	.382	2.619
	CAUSE6	.556	1.797
	CAUSE7	.670	1.492
9	(Constant)		
	CAUSE2	.469	2.131
	CAUSE4	.341	2.932
	CAUSE5	.450	2.220
	CAUSE7	.789	1.267
10	(Constant)		
	CAUSE2	.484	2.066
	CAUSE4	.480	2.082
	CAUSE7	.790	1.266

a. Dependent Variable: SCP1

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCPI	5.282	1.6380	55
CAUSE_1	5.391	2.2396	55
CAUSE_2	5.464	2.1897	55
CAUSE_3	5.400	2.2307	55
CAUSE_4	5.764	2.4092	55
CAUSE_5	5.500	2.2812	55
CAUSE_6	5.655	9.0615	55
CAUSE_7	4.600	2.4578	55
CAUSE_8	5.482	2.2770	55
CAUSE_9	4.809	2.1398	55
CAUSE_10	6.400	1.9940	55
CAUSE_11	4.891	2.3935	55
CAUSE_12	5.245	2.2564	55

Model Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.702[a]	.493	.348	1.3231	.493	3.397	12	42	.002
2	.702[b]	.493	.363	1.3076	.000	.001	1	44	.974
3	.701[c]	.492	.377	1.2933	-.001	.044	1	45	.836
4	.701[d]	.492	.390	1.2792	.000	.022	1	46	.883
5	.699[e]	.489	.400	1.2684	-.003	.225	1	47	.638
6	.698[f]	.487	.411	1.2575	-.002	.198	1	48	.659
7	.695[g]	.483	.419	1.2486	-.004	.323	1	49	.572
8	.691[h]	.477	.424	1.2432	-.006	.577	1	50	.451
9	.684[i]	.468	.425	1.2421	-.010	.911	1	51	.344
10	.677[j]	.458	.426	1.2411	-.010	.915	1	52	.343
11	.661[k]	.437	.416	1.2521	-.021	1.929	1	53	.171

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_2
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_2
f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_2
g. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_5
h. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1
i. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_1
j. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_1
k. Predictors: (Constant), CAUSE_4, CAUSE_1
l. Dependent Variable: SCP1

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.357	12	5.946	3.397	.002[a]
	Residual	73.525	42	1.751		
	Total	144.882	54			
2	Regression	71.355	11	6.487	3.794	.001[b]
	Residual	73.527	43	1.710		
	Total	144.882	54			

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	71.281	10	7.128	4.261	.000[c]
	Residual	73.601	44	1.673		
	Total	144.882	54			
4	Regression	71.244	9	7.916	4.837	.000[d]
	Residual	73.638	45	1.636		
	Total	144.882	54			
5	Regression	70.876	8	8.860	5.507	.000[e]
	Residual	74.005	46	1.609		
	Total	144.882	54			
6	Regression	70.559	7	10.080	6.374	.000[f]
	Residual	74.323	47	1.581		
	Total	144.882	54			
7	Regression	70.048	6	11.675	7.488	.000[g]
	Residual	74.834	48	1.559		
	Total	144.882	54			
8	Regression	69.148	5	13.830	8.948	.000[h]
	Residual	75.734	49	1.546		
	Total	144.882	54			
9	Regression	67.739	4	16.935	10.976	.000[i]
	Residual	77.142	50	1.543		
	Total	144.882	54			
10	Regression	66.327	3	22.109	14.354	.000[j]
	Residual	78.554	51	1.540		
	Total	144.882	54			
11	Regression	63.357	2	31.678	20.206	.000[k]
	Residual	81.525	52	1.568		
	Total	144.882	54			

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_2
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_2
f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_2
g. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_5
h. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_7, CAUSE_1
i. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_1

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2[a]	.	Enter
2	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP1-MC

Analysis for Ca-SCP1-MC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP1

Analysis for Ca-SCP1-MC

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	2.724	.585		4.659	.000	1.549	3.899			
	CAUSE_1	.294	.101	.402	2.918	.005	.092	.496	.595	.385	.301
	CAUSE_4	.222	.099	.326	2.236	.030	.022	.421	.597	.304	.231
	CAUSE_6	-2.147E-02	.020	-.119	-1.086	.283	-.061	.018	.084	-.153	-.112
	CAUSE_7	8.029E-02	.084	.120	.955	.344	-.089	.249	.424	.135	.099
	CAUSE_12	-.105	.078	-.145	-1.352	.183	-.262	.051	-.015	-.190	-.140
9	(Constant)	2.801	.579		4.841	.000	1.639	3.963			
	CAUSE_1	.305	.100	.418	3.058	.004	.105	.506	.595	.397	.316
	CAUSE_4	.257	.092	.378	2.790	.007	.072	.442	.597	.367	.288
	CAUSE_6	-1.869E-02	.020	-.103	-.957	.343	-.058	.021	.084	-.134	-.099
	CAUSE_12	-.103	.078	-.142	-1.323	.192	-.259	.053	-.015	-.184	-.137
10	(Constant)	2.842	.576		4.930	.000	1.685	3.999			
	CAUSE_1	.301	.100	.412	3.022	.004	.101	.502	.595	.390	[illegible]
	CAUSE_4	.239	.090	.352	2.656	.011	.058	.420	.597	.349	[illegible]
	CAUSE_12	-.108	.078	-.148	-1.389	.171	-.263	.048	-.015	-.191	[illegible]
11	(Constant)	2.398	.484		4.954	.000	1.427	3.369			
	CAUSE_1	.267	.097	.365	2.739	.008	.071	.463	.595	.355	[illegible]
	CAUSE_4	.251	.091	.360	2.766	.008	.069	.432	.597	.358	[illegible]

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.150	6.668
	CAUSE_3	.440	2.272
	CAUSE_4	.195	5.125
	CAUSE_5	.299	3.343
	CAUSE_6	.783	1.277
	CAUSE_7	.394	2.541
	CAUSE_8	.187	5.351
	CAUSE_9	.257	3.897
	CAUSE_10	.337	2.964
	CAUSE_11	.250	3.995
	CAUSE_12	.568	1.761
2	(Constant)		
	CAUSE_1	.226	4.418
	CAUSE_2	.150	6.664
	CAUSE_4	.195	5.120
	CAUSE_5	.343	2.916
	CAUSE_6	.786	1.272
	CAUSE_7	.398	2.513
	CAUSE_8	.190	5.274
	CAUSE_9	.258	3.876
	CAUSE_10	.338	2.961
	CAUSE_11	.262	3.820
	CAUSE_12	.571	1.752
3	(Constant)		
	CAUSE_1	.228	4.385
	CAUSE_2	.151	6.601
	CAUSE_4	.216	4.631
	CAUSE_5	.359	2.789
	CAUSE_6	.786	1.272
	CAUSE_7	.402	2.486
	CAUSE_8	.216	4.620
	CAUSE_10	.354	2.822
	CAUSE_11	.275	3.639
	CAUSE_12	.573	1.745

Analysis for Ca-SCP1-MC

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	2.924	.739		3.956	.000	1.433	4.416			
	CAUSE_1	.354	.174	.483	2.030	.049	.002	.705	.595	.299	.223
	CAUSE_2	-.121	.212	-.161	-.568	.573	-.549	.308	.597	-.087	-.062
	CAUSE_3	-3.929E-03	.122	-.005	-.032	.974	-.249	.242	.474	-.005	-.004
	CAUSE_4	.187	.169	.275	1.105	.275	-.154	.528	.597	.168	.121
	CAUSE_5	9.940E-02	.144	.138	.689	.495	-.192	.391	.509	.106	.076
	CAUSE_6	-2.465E-02	.022	-.136	-1.098	.279	-.070	.021	.084	-.167	-.121
	CAUSE_7	.112	.117	.169	.963	.341	-.123	.348	.424	.147	.106
	CAUSE_8	-3.701E-02	.183	-.051	-.202	.841	-.406	.332	.308	-.031	-.022
	CAUSE_9	3.456E-02	.166	.045	.208	.836	-.301	.370	.329	.032	.023
	CAUSE_10	-9.508E-02	.155	-.116	-.612	.544	-.409	.219	.141	-.094	-.067
	CAUSE_11	5.939E-02	.150	.087	.395	.695	-.244	.363	.276	.061	[illegible]
	CAUSE_12	-9.830E-02	.106	-.135	-.928	.359	-.312	.115	-.015	-.142	[illegible]
2	(Constant)	2.920	.717		4.074	.000	1.474	4.365			
	CAUSE_1	.352	.167	.482	2.109	.041	.015	.689	.595	.306	[illegible]
	CAUSE_2	-.121	.210	-.161	-.576	.568	-.544	.302	.597	-.087	[illegible]
	CAUSE_4	.187	.167	.275	1.120	.269	-.150	.524	.597	.168	[illegible]
	CAUSE_5	9.773E-02	.133	.136	.734	.467	-.171	.366	.509	.111	[illegible]
	CAUSE_6	-2.461E-02	.022	-.136	-1.111	.273	-.069	.020	.084	-.167	[illegible]
	CAUSE_7	.112	.115	.168	.976	.334	-.119	.344	.424	.147	[illegible]
	CAUSE_8	-3.772E-02	.179	-.052	-.210	.835	-.400	.324	.308	-.032	[illegible]
	CAUSE_9	3.417E-02	.164	.045	.209	.836	-.296	.364	.329	.032	[illegible]
	CAUSE_10	-9.493E-02	.154	-.116	-.618	.540	-.405	.215	.141	-.094	[illegible]
	CAUSE_11	6.041E-02	.145	.088	.416	.680	-.233	.353	.276	.063	.045
	CAUSE_12	-9.806E-02	.104	-.135	-.939	.353	-.309	.112	-.015	-.142	-.102
3	(Constant)	2.902	.704		4.123	.000	1.483	4.320			
	CAUSE_1	.349	.165	.477	2.122	.040	.017	.681	.595	.305	.228
	CAUSE_2	-.117	.207	-.156	-.564	.575	-.533	.300	.597	-.085	-.061
	CAUSE_4	.198	.157	.291	1.259	.215	-.119	.515	.597	.186	.135
	CAUSE_5	9.193E-02	.129	.128	.714	.479	-.168	.352	.509	.107	.077
	CAUSE_6	-2.457E-02	.022	-.136	-1.121	.268	-.069	.020	.084	-.167	-.121
	CAUSE_7	.110	.113	.164	.970	.337	-.118	.337	.424	.145	.104
	CAUSE_8	-2.452E-02	.166	-.034	-.148	.883	-.359	.310	.308	-.022	-.016
	CAUSE_10	-8.798E-02	.148	-.107	-.593	.556	-.387	.211	.141	-.089	-.064
	CAUSE_11	6.700E-02	.140	.098	.478	.635	-.216	.350	.276	.072	.051
	CAUSE_12	-9.663E-02	.103	-.133	-.938	.353	-.304	.111	-.015	-.140	-.101

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	2.902	.696		4.168	.000	1.499	4.304			
	CAUSE_1	.350	.163	.478	2.149	.037	.022	.677	.595	.305	.228
	CAUSE_2	-.121	.202	-.162	-.599	.552	-.528	.286	.597	-.089	-.064
	CAUSE_4	.202	.153	.297	1.322	.193	-.106	.510	.597	.193	.140
	CAUSE_5	9.034E-02	.127	.126	.711	.481	-.165	.346	.509	.105	.076
	CAUSE_6	-2.522E-02	.021	-.140	-1.188	.241	-.068	.018	.084	-.174	-.126
	CAUSE_7	.102	.098	.153	1.034	.307	-.096	.300	.424	.152	.110
	CAUSE_10	-9.153E-02	.145	-.111	-.632	.530	-.383	.200	.141	-.094	-.067
	CAUSE_11	5.628E-02	.119	.082	.474	.638	-.183	.295	.276	.070	.050
	CAUSE_12	-9.912E-02	.101	-.137	-.986	.329	-.302	.103	-.015	-.145	-.105
5	(Constant)	2.818	.668		4.220	.000	1.474	4.162			
	CAUSE_1	.343	.161	.469	2.133	.038	.019	.666	.595	.300	[illegible]
	CAUSE_2	-.102	.196	-.136	-.518	.607	-.496	.293	.597	-.076	[illegible]
	CAUSE_4	.195	.151	.287	1.293	.202	-.109	.499	.597	.187	[illegible]
	CAUSE_5	9.326E-02	.126	.130	.742	.462	-.160	.346	.509	.109	[illegible]
	CAUSE_6	-2.640E-02	.021	-.146	-1.263	.213	-.068	.016	.084	-.183	[illegible]
	CAUSE_7	.115	.094	.172	1.224	.227	-.074	.303	.424	.178	[illegible]
	CAUSE_10	-5.237E-02	.118	-.064	-.445	.659	-.290	.185	.141	-.065	[illegible]
	CAUSE_12	-9.708E-02	.100	-.134	-.975	.335	-.298	.103	-.015	-.142	[illegible]
6	(Constant)	2.698	.605		4.457	.000	1.480	3.916			
	CAUSE_1	.355	.157	.486	2.267	.028	.040	.671	.595	.314	[illegible]
	CAUSE_2	-.110	.194	-.147	-.568	.572	-.499	.279	.597	-.083	[illegible]
	CAUSE_4	.187	.148	.275	1.259	.214	-.112	.486	.597	.181	[illegible]
	CAUSE_5	9.080E-02	.125	.126	.729	.470	-.160	.341	.509	.106	.076
	CAUSE_6	-2.553E-02	.021	-.141	-1.237	.222	-.067	.016	.084	-.178	-.129
	CAUSE_7	.104	.090	.156	1.159	.252	-.077	.285	.424	.167	.121
	CAUSE_12	-.122	.081	-.169	-1.511	.138	-.285	.041	-.015	-.215	-.158
7	(Constant)	2.650	.595		4.452	.000	1.453	3.847			
	CAUSE_1	.288	.101	.394	2.837	.007	.084	.492	.595	.379	.294
	CAUSE_4	.153	.135	.225	1.133	.263	-.118	.424	.597	.161	.118
	CAUSE_5	9.386E-02	.124	.131	.760	.451	-.155	.342	.509	.109	.079
	CAUSE_6	-2.283E-02	.020	-.126	-1.145	.258	-.063	.017	.084	-.163	-.119
	CAUSE_7	8.911E-02	.085	.134	1.045	.301	-.082	.261	.424	.149	.108
	CAUSE_12	-.114	.079	-.157	-1.442	.156	-.273	.045	-.015	-.204	-.149

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP1	4.927	1.4192	117
CAUSE_1	6.329	1.6945	117
CAUSE_2	5.368	1.7731	117
CAUSE_3	5.581	1.7665	117
CAUSE_4	5.350	1.6417	117
CAUSE_5	5.261	1.6976	117
CAUSE_6	5.171	1.7034	117
CAUSE_7	5.500	1.7145	117
CAUSE_8	6.444	1.6697	117
CAUSE_9	7.162	1.6646	117
CAUSE_10	5.615	1.5134	117
CAUSE_11	5.551	1.6287	117
CAUSE_12	5.765	1.7039	117

Correlations

		SCP1	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP1	1.000	.364	.451	.300	.324	.352	.269	.362	.288	.260
	CAUSE_1	.364	1.000	.662	.486	.432	.520	.496	.329	.453	.384
	CAUSE_2	.451	.662	1.000	.607	.561	.516	.445	.355	.402	.390
	CAUSE_3	.300	.486	.607	1.000	.624	.565	.566	.500	.319	.473
	CAUSE_4	.324	.432	.561	.624	1.000	.644	.472	.420	.395	.386
	CAUSE_5	.352	.520	.516	.565	.644	1.000	.654	.405	.446	.376
	CAUSE_6	.269	.496	.445	.566	.472	.654	1.000	.481	.417	.464
	CAUSE_7	.362	.329	.355	.500	.420	.405	.481	1.000	.416	.331
	CAUSE_8	.288	.453	.402	.319	.395	.446	.417	.416	1.000	.478
	CAUSE_9	.260	.384	.390	.473	.386	.376	.464	.331	.478	1.000
	CAUSE_10	.252	.331	.265	.394	.487	.492	.348	.229	.339	.502
	CAUSE_11	.289	.288	.386	.406	.495	.429	.356	.418	.483	.537
	CAUSE_12	.158	.199	.112	.218	.237	.238	.278	.292	.350	.280
Sig. (1-tailed)	SCP1	.	.000	.000	.001	.000	.000	.002	.000	.001	[illegible]
	CAUSE_1	.000	.	.000	.000	.000	.000	.000	.000	.000	[illegible]
	CAUSE_2	.000	.000	.	.000	.000	.000	.000	.000	.000	[illegible]
	CAUSE_3	.001	.000	.000	.	.000	.000	.000	.000	.000	[illegible]
	CAUSE_4	.000	.000	.000	.000	.	.000	.000	.000	.000	[illegible]
	CAUSE_5	.000	.000	.000	.000	.000	.	.000	.000	.000	[illegible]
	CAUSE_6	.002	.000	.000	.000	.000	.000	.	.000	.000	[illegible]
	CAUSE_7	.000	.000	.000	.000	.000	.000	.000	.	.000	[illegible]
	CAUSE_8	.001	.000	.000	.000	.000	.000	.000	.000	.	[illegible]
	CAUSE_9	.002	.000	.000	.000	.000	.000	.000	.000	.000	.
	CAUSE_10	.003	.000	.002	.000	.000	.000	.000	.006	.000	[illegible]
	CAUSE_11	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_12	.045	.016	.114	.009	.005	.005	.001	.001	.000	.001
N	SCP1	117	117	117	117	117	117	117	117	117	117
	CAUSE_1	117	117	117	117	117	117	117	117	117	117
	CAUSE_2	117	117	117	117	117	117	117	117	117	117
	CAUSE_3	117	117	117	117	117	117	117	117	117	117
	CAUSE_4	117	117	117	117	117	117	117	117	117	117
	CAUSE_5	117	117	117	117	117	117	117	117	117	117
	CAUSE_6	117	117	117	117	117	117	117	117	117	117
	CAUSE_7	117	117	117	117	117	117	117	117	117	117
	CAUSE_8	117	117	117	117	117	117	117	117	117	117
	CAUSE_9	117	117	117	117	117	117	117	117	117	117
	CAUSE_10	117	117	117	117	117	117	117	117	117	117

Coefficients^a

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE_1	.228	4.383
	CAUSE_2	.155	6.458
	CAUSE_4	.223	4.477
	CAUSE_5	.361	2.769
	CAUSE_6	.819	1.221
	CAUSE_7	.519	1.927
	CAUSE_10	.364	2.748
	CAUSE_11	.375	2.664
	CAUSE_12	.589	1.698
5	(Constant)		
	CAUSE_1	.230	4.347
	CAUSE_2	.162	6.190
	CAUSE_4	.225	4.436
	CAUSE_5	.362	2.763
	CAUSE_6	.830	1.204
	CAUSE_7	.562	1.778
	CAUSE_10	.540	1.852
	CAUSE_12	.590	1.695
6	(Constant)		
	CAUSE_1	.238	4.209
	CAUSE_2	.163	6.131
	CAUSE_4	.229	4.368
	CAUSE_5	.363	2.757
	CAUSE_6	.838	1.194
	CAUSE_7	.601	1.664
	CAUSE_12	.876	1.141
7	(Constant)		
	CAUSE_1	.559	1.789
	CAUSE_4	.274	3.654
	CAUSE_5	.363	2.752
	CAUSE_6	.854	1.131
	CAUSE_7	.657	1.521
	CAUSE_12	.907	1.102

Coefficients^a

Model		Collinearity Statistics Tolerance	VIF
8	(Constant)		
	CAUSE_1	.562	1.778
	CAUSE_4	.502	1.993
	CAUSE_6	.892	1.122
	CAUSE_7	.670	1.493
	CAUSE_12	.926	1.080
9	(Constant)		
	CAUSE_1	.571	1.752
	CAUSE_4	.581	1.721
	CAUSE_6	.911	1.097
	CAUSE_12	.927	1.079
10	(Constant)		
	CAUSE_1	.572	1.749
	CAUSE_4	.605	1.654
	CAUSE_12	.931	1.074
11	(Constant)		
	CAUSE_1	.609	1.641
	CAUSE_4	.609	1.641

a. Dependent Variable: SCP1

Pearson Correlation	SCP1	.252	.289	.158
	CAUSE_1	.331	.288	.199
	CAUSE_2	.265	.386	.112
	CAUSE_3	.394	.406	.218
	CAUSE_4	.487	.495	.237
	CAUSE_5	.492	.429	.238
	CAUSE_6	.348	.356	.278
	CAUSE_7	.229	.418	.292
	CAUSE_8	.339	.483	.350
	CAUSE_9	.502	.537	.289
	CAUSE_10	1.000	.506	.349
	CAUSE_11	.506	1.000	.392
	CAUSE_12	.349	.392	1.000
Sig. (1-tailed)	SCP1	.003	.001	.045
	CAUSE_1	.000	.001	.016
	CAUSE_2	.002	.000	.114
	CAUSE_3	.000	.000	.009
	CAUSE_4	.000	.000	.005
	CAUSE_5	.000	.000	.005
	CAUSE_6	.000	.000	.001
	CAUSE_7	.006	.000	.001
	CAUSE_8	.000	.000	.000
	CAUSE_9	.000	.000	.001
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.000
	CAUSE_12	.000	.000	.
N	SCP1	117	117	117
	CAUSE_1	117	117	117
	CAUSE_2	117	117	117
	CAUSE_3	117	117	117
	CAUSE_4	117	117	117
	CAUSE_5	117	117	117
	CAUSE_6	117	117	117
	CAUSE_7	117	117	117
	CAUSE_8	117	117	117
	CAUSE_9	117	117	117
	CAUSE_10	117	117	117
	CAUSE_11	117	117	117
	CAUSE_12	117	117	117

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5[a]	.	Enter
2	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
7	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP1

Model Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.526[a]	.277	.194	1.2743	.277	3.323	12	104	.000
2	.526[b]	.277	.201	1.2682	.000	.004	1	106	.949
3	.526[c]	.277	.209	1.2622	.000	.004	1	107	.952
4	.526[d]	.277	.216	1.2565	.000	.032	1	108	.859
5	.526[e]	.277	.223	1.2510	.000	.057	1	109	.812
6	.525[f]	.276	.229	1.2458	-.001	.093	1	110	.761
7	.524[g]	.274	.235	1.2414	-.002	.231	1	111	.632
8	.522[h]	.273	.240	1.2373	-.002	.257	1	112	.613
9	.518[i]	.269	.243	1.2351	-.004	.613	1	113	.435
10	.511[j]	.261	.242	1.2358	-.007	1.129	1	114	.290
11	.500[k]	.250	.237	1.2397	-.011	1.716	1	115	.193

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_1, CAUSE_3, CAUSE_5

e. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_1, CAUSE_3, CAUSE_5

f. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_1, CAUSE_3, CAUSE_5

g. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_3, CAUSE_5

h. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_3, CAUSE_5

i. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_3

j. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7

k. Predictors: (Constant), CAUSE_2, CAUSE_7

l. Dependent Variable: SCP1

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	64.759	12	5.397	3.323	.000[a]
	Residual	168.873	104	1.624		
	Total	233.632	116			
2	Regression	64.753	11	5.887	3.660	.000[b]
	Residual	168.880	105	1.608		
	Total	233.632	116			

Analysis for Ca-SCP1-SC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	1.729	.648		2.667	.009	.444	3.015			
	CAUSE_1	4.391E-02	.098	.052	.447	.655	-.151	.238	.364	.043	.037
	CAUSE_2	.280	.100	.349	2.802	.006	.082	.477	.451	.261	.230
	CAUSE_3	-.106	.098	-.132	-1.074	.285	-.301	.089	.300	-.103	-.088
	CAUSE_5	9.487E-02	.105	.113	.900	.370	-.114	.304	.352	.087	.074
	CAUSE_6	-6.589E-02	.102	-.079	-.644	.521	-.269	.137	.269	-.062	-.053
	CAUSE_7	.201	.083	.243	2.407	.018	.035	.366	.362	.227	.198
	CAUSE_9	2.579E-02	.091	.030	.284	.777	-.154	.205	.260	.027	.023
	CAUSE_10	8.146E-02	.100	.087	.812	.419	-.117	.280	.252	.078	.067
	CAUSE_12	1.811E-02	.076	.022	.238	.812	-.133	.169	.158	.023	.020
5	(Constant)	1.772	.621		2.854	.005	.541	3.002			
	CAUSE_1	4.524E-02	.098	.054	.464	.644	-.148	.239	.364	.045	.038
	CAUSE_2	.277	.099	.347	2.804	.006	.081	.474	.451	.260	.229
	CAUSE_3	-.106	.098	-.132	-1.084	.281	-.301	.088	.300	-.104	-.089
	CAUSE_5	9.435E-02	.105	.113	.899	.370	-.114	.302	.352	.086	.074
	CAUSE_6	-6.398E-02	.102	-.077	-.630	.530	-.265	.137	.269	-.061	-.052
	CAUSE_7	.204	.082	.247	2.502	.014	.042	.366	.362	.234	.205
	CAUSE_9	2.747E-02	.090	.032	.305	.761	-.151	.206	.260	.029	.025
	CAUSE_10	8.668E-02	.097	.092	.889	.376	-.107	.280	.252	.085	.073
6	(Constant)	1.838	.579		3.175	.002	.691	2.986			
	CAUSE_1	4.660E-02	.097	.056	.480	.632	-.146	.239	.364	.046	.039
	CAUSE_2	.281	.098	.350	2.862	.005	.086	.475	.451	.264	.233
	CAUSE_3	-.102	.097	-.127	-1.057	.293	-.294	.089	.300	-.101	-.086
	CAUSE_5	8.970E-02	.103	.107	.868	.387	-.115	.295	.352	.083	.071
	CAUSE_6	-5.717E-02	.099	-.069	-.580	.563	-.253	.138	.269	-.055	-.047
	CAUSE_7	.206	.081	.249	2.536	.013	.045	.367	.362	.236	.207
	CAUSE_10	9.806E-02	.090	.105	1.093	.277	-.080	.276	.252	.104	.089
7	(Constant)	1.919	.552		3.478	.001	.826	3.013			
	CAUSE_2	.304	.085	.379	3.572	.001	.135	.472	.451	.322	.290
	CAUSE_3	-.104	.096	-.129	-1.075	.285	-.295	.087	.300	-.102	-.087
	CAUSE_5	9.455E-02	.103	.113	.922	.358	-.109	.298	.352	.088	.075
	CAUSE_6	-4.904E-02	.097	-.059	-.507	.613	-.241	.143	.269	-.048	-.041
	CAUSE_7	.206	.081	.249	2.551	.012	.046	.367	.362	.236	.207
	CAUSE_10	.103	.089	.110	1.156	.250	-.073	.279	.252	.110	.094

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
8	(Constant)	1.891	.547		3.456	.001	.807	2.976			
	CAUSE_2	.303	.085	.378	3.573	.001	.135	.471	.451	.321	.289
	CAUSE_3	-.113	.094	-.141	-1.203	.232	-.300	.073	.300	-.113	-.097
	CAUSE_5	7.219E-02	.092	.086	.783	.435	-.111	.255	.352	.074	.063
	CAUSE_7	.197	.079	.238	2.510	.014	.042	.353	.362	.232	.203
	CAUSE_10	.103	.089	.110	1.164	.247	-.072	.279	.252	.110	.094
9	(Constant)	1.899	.546		3.477	.001	.817	2.982			
	CAUSE_2	.320	.082	.400	3.919	.000	.158	.482	.451	.347	.317
	CAUSE_3	-9.758E-02	.092	-.121	-1.062	.290	-.280	.084	.300	-.100	-.086
	CAUSE_7	.207	.078	.250	2.667	.009	.053	.360	.362	.244	.216
	CAUSE_10	.128	.083	.136	1.549	.124	-.036	.291	.252	.145	.125
10	(Constant)	1.884	.546		3.447	.001	.801	2.966			
	CAUSE_2	.276	.071	.345	3.911	.000	.136	.417	.451	.345	.316
	CAUSE_7	.177	.072	.214	2.448	.016	.034	.321	.362	.224	.198
	CAUSE_10	.104	.080	.111	1.310	.193	-.053	.262	.252	.122	.106
11	(Constant)	2.290	.451		5.077	.000	1.396	3.184			
	CAUSE_2	.295	.069	.369	4.250	.000	.158	.433	.451	.370	.345
	CAUSE_7	.191	.072	.231	2.666	.009	.049	.334	.362	.242	.216

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	64.747	10	6.475	4.064	.000[c]
	Residual	168.886	106	1.593		
	Total	233.632	116			
4	Regression	64.696	9	7.188	4.553	.000[d]
	Residual	168.936	107	1.579		
	Total	233.632	116			
5	Regression	64.607	8	8.076	5.160	.000[e]
	Residual	169.026	108	1.565		
	Total	233.632	116			
6	Regression	64.461	7	9.209	5.933	.000[f]
	Residual	169.172	109	1.552		
	Total	233.632	116			
7	Regression	64.103	6	10.684	6.932	.000[g]
	Residual	169.530	110	1.541		
	Total	233.632	116			
8	Regression	63.707	5	12.741	8.323	.000[h]
	Residual	169.925	111	1.531		
	Total	233.632	116			
9	Regression	62.769	4	15.692	10.286	.000[i]
	Residual	170.863	112	1.526		
	Total	233.632	116			
10	Regression	61.047	3	20.349	13.323	.000[j]
	Residual	172.586	113	1.527		
	Total	233.632	116			
11	Regression	58.426	2	29.213	19.008	.000[k]
	Residual	175.207	114	1.537		
	Total	233.632	116			

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_1, CAUSE_3, CAUSE_5

e. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_1, CAUSE_3, CAUSE_5

f. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_1, CAUSE_3, CAUSE_5

g. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_3, CAUSE_5

h. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_3, CAUSE_5

i. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_3

j. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7

k. Predictors: (Constant), CAUSE_2, CAUSE_7

l. Dependent Variable: SCP1

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	1.743	.664		2.625	.010	.426	3.060			
	CAUSE_1	4.438E-02	.102	.053	.433	.666	-.159	.248	.364	.042	.036
	CAUSE_2	.284	.106	.354	2.684	.008	.074	.493	.451	.254	.224
	CAUSE_3	-.102	.105	-.127	-.972	.333	-.311	.106	.300	-.095	-.081
	CAUSE_4	-1.991E-02	.111	-.023	-.179	.858	-.240	.200	.324	-.018	-.015
	CAUSE_5	.102	.114	.122	.895	.373	-.124	.327	.352	.087	.075
	CAUSE_6	-6.642E-02	.104	-.080	-.637	.525	-.273	.140	.269	-.062	-.053
	CAUSE_7	.203	.088	.245	2.293	.024	.027	.378	.362	.219	.191
	CAUSE_8	-6.609E-03	.094	-.008	-.070	.944	-.194	.181	.288	-.007	-.006
	CAUSE_9	2.531E-02	.099	.030	.256	.799	-.171	.222	.260	.025	.021
	CAUSE_10	8.400E-02	.107	.090	.788	.432	-.127	.295	.252	.077	.066
	CAUSE_11	6.519E-03	.102	.007	.064	.949	-.197	.210	.289	.006	.005
	CAUSE_12	1.850E-02	.080	.022	.231	.817	-.140	.177	.158	.023	.019
2	(Constant)	1.741	.660		2.637	.010	.432	3.051			
	CAUSE_1	4.339E-02	.101	.052	.431	.668	-.156	.243	.364	.042	.036
	CAUSE_2	.284	.104	.355	2.733	.007	.078	.491	.451	.258	.227
	CAUSE_3	-.103	.105	-.128	-.981	.329	-.310	.105	.300	-.095	-.081
	CAUSE_4	-1.891E-02	.109	-.022	-.173	.863	-.236	.198	.324	-.017	-.014
	CAUSE_5	.102	.113	.122	.903	.369	-.122	.326	.352	.088	.075
	CAUSE_6	-6.692E-02	.103	-.080	-.647	.519	-.272	.138	.269	-.063	-.054
	CAUSE_7	.204	.087	.246	2.350	.021	.032	.375	.362	.224	.195
	CAUSE_8	-5.643E-03	.093	-.007	-.061	.952	-.189	.178	.288	-.006	-.005
	CAUSE_9	2.690E-02	.095	.032	.282	.778	-.162	.216	.260	.028	.023
	CAUSE_10	8.539E-02	.104	.091	.822	.413	-.121	.291	.252	.080	.068
	CAUSE_12	1.944E-02	.078	.023	.248	.804	-.136	.175	.158	.024	.021
3	(Constant)	1.737	.653		2.661	.009	.443	3.030			
	CAUSE_1	4.239E-02	.099	.051	.428	.669	-.154	.239	.364	.042	.035
	CAUSE_2	.284	.103	.355	2.751	.007	.079	.489	.451	.258	.227
	CAUSE_3	-.101	.102	-.126	-.993	.323	-.304	.101	.300	-.096	-.082
	CAUSE_4	-1.935E-02	.109	-.022	-.178	.859	-.235	.196	.324	-.017	-.015
	CAUSE_5	.101	.111	.121	.907	.367	-.120	.322	.352	.088	.075
	CAUSE_6	-6.696E-02	.103	-.080	-.651	.517	-.271	.137	.269	-.063	-.054
	CAUSE_7	.202	.084	.245	2.401	.018	.035	.370	.362	.227	.198
	CAUSE_9	2.530E-02	.091	.030	.278	.782	-.155	.206	.260	.027	.023
	CAUSE_10	8.551E-02	.103	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Model		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.585	1.710
	CAUSE_3	.477	2.096
	CAUSE_5	.539	1.856
	CAUSE_7	.727	1.376
	CAUSE_10	.735	1.361
9	(Constant)		
	CAUSE_2	.627	1.594
	CAUSE_3	.500	2.001
	CAUSE_7	.744	1.343
	CAUSE_10	.843	1.187
10	(Constant)		
	CAUSE_2	.838	1.193
	CAUSE_7	.854	1.171
	CAUSE_10	.909	1.100
11	(Constant)		
	CAUSE_2	.874	1.144
	CAUSE_7	.874	1.144

a. Dependent Variable: SCP1

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP1	5.280	1.6525	25
CAUSE_1	6.800	2.2913	25
CAUSE_2	6.680	2.1884	25
CAUSE_3	6.600	2.2913	25
CAUSE_4	6.820	2.3313	25
CAUSE_5	6.700	2.2638	25
CAUSE_6	6.200	2.2958	25
CAUSE_7	5.680	2.0355	25
CAUSE_8	6.400	1.8428	25
CAUSE_9	5.520	2.3826	25
CAUSE_10	6.440	2.0530	25
CAUSE_11	5.320	2.5612	25
CAUSE_12	5.600	2.3629	25

		Collinearity Statistics	
Model		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.465	2.152
	CAUSE_2	.399	2.507
	CAUSE_3	.406	2.466
	CAUSE_4	.421	2.378
	CAUSE_5	.376	2.657
	CAUSE_6	.444	2.250
	CAUSE_7	.610	1.639
	CAUSE_8	.564	1.774
	CAUSE_9	.516	1.938
	CAUSE_10	.538	1.859
	CAUSE_11	.502	1.991
	CAUSE_12	.754	1.326
2	(Constant)		
	CAUSE_1	.476	2.102
	CAUSE_2	.407	2.456
	CAUSE_3	.406	2.461
	CAUSE_4	.429	2.330
	CAUSE_5	.377	2.652
	CAUSE_6	.447	2.237
	CAUSE_7	.629	1.591
	CAUSE_8	.579	1.728
	CAUSE_9	.552	1.813
	CAUSE_10	.561	1.781
	CAUSE_12	.781	1.281
3	(Constant)		
	CAUSE_1	.489	2.047
	CAUSE_2	.410	2.439
	CAUSE_3	.423	2.366
	CAUSE_4	.431	2.320
	CAUSE_5	.384	2.606
	CAUSE_6	.447	2.237
	CAUSE_7	.657	1.521
	CAUSE_9	.597	1.674
	CAUSE_10	.562	1.781
	CAUSE_12	.809	1.236

Coefficients[a]

		Collinearity Statistics	
Model		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.492	2.032
	CAUSE_2	.435	2.300
	CAUSE_3	.450	2.223
	CAUSE_5	.425	2.352
	CAUSE_6	.449	2.229
	CAUSE_7	.665	1.503
	CAUSE_9	.598	1.673
	CAUSE_10	.590	1.694
	CAUSE_12	.810	1.235
5	(Constant)		
	CAUSE_1	.494	2.025
	CAUSE_2	.438	2.281
	CAUSE_3	.450	2.222
	CAUSE_5	.425	2.351
	CAUSE_6	.451	2.216
	CAUSE_7	.688	1.454
	CAUSE_9	.601	1.663
	CAUSE_10	.620	1.614
6	(Constant)		
	CAUSE_1	.495	2.021
	CAUSE_2	.443	2.257
	CAUSE_3	.458	2.184
	CAUSE_5	.435	2.301
	CAUSE_6	.474	2.109
	CAUSE_7	.690	1.449
	CAUSE_10	.726	1.378
7	(Constant)		
	CAUSE_2	.585	1.711
	CAUSE_3	.458	2.182
	CAUSE_5	.439	2.279
	CAUSE_6	.489	2.047
	CAUSE_7	.690	1.449
	CAUSE_10	.735	1.361

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4[a]	.	Enter
2	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP1

Analysis for Ca-SCP1-CC

Correlations

		SCP1	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP1	1.000	.709	.755	.471	.619	.371	.498	.399	.639	.565
	CAUSE_1	.709	1.000	.942	.571	.835	.651	.440	.316	.405	.386
	CAUSE_2	.755	.942	1.000	.597	.829	.621	.442	.294	.452	.385
	CAUSE_3	.471	.571	.597	1.000	.746	.442	.202	.472	.528	.498
	CAUSE_4	.619	.835	.829	.746	1.000	.747	.281	.251	.388	.389
	CAUSE_5	.371	.651	.621	.442	.747	1.000	.423	-.080	.210	.088
	CAUSE_6	.498	.440	.442	.202	.281	.423	1.000	.277	.510	.155
	CAUSE_7	.399	.316	.294	.472	.251	-.080	.277	1.000	.530	.611
	CAUSE_8	.639	.405	.452	.528	.388	.210	.510	.530	1.000	.748
	CAUSE_9	.565	.386	.385	.498	.389	.088	.155	.611	.748	1.000
	CAUSE_10	.662	.617	.624	.500	.631	.424	.414	.404	.665	.718
	CAUSE_11	.564	.452	.413	.555	.530	.165	.315	.508	.669	.736
	CAUSE_12	.441	.323	.325	.316	.221	-.090	.396	.466	.522	.401
Sig. (1-tailed)	SCP1	.	.000	.000	.009	.000	.034	.006	.024	.000	.002
	CAUSE_1	.000	.	.000	.001	.000	.000	.014	.062	.022	.028
	CAUSE_2	.000	.000	.	.001	.000	.000	.013	.077	.012	.029
	CAUSE_3	.009	.001	.001	.	.000	.014	.166	.009	.003	.006
	CAUSE_4	.000	.000	.000	.000	.	.000	.086	.113	.028	.027
	CAUSE_5	.034	.000	.000	.014	.000	.	.018	.351	.157	.338
	CAUSE_6	.006	.014	.013	.166	.086	.018	.	.090	.005	.229
	CAUSE_7	.024	.062	.077	.009	.113	.351	.090	.	.003	.001
	CAUSE_8	.000	.022	.012	.003	.028	.157	.005	.003	.	.000
	CAUSE_9	.002	.028	.029	.006	.027	.338	.229	.001	.000	.
	CAUSE_10	.000	.001	.000	.006	.000	.017	.020	.023	.000	.000
	CAUSE_11	.002	.012	.020	.002	.003	.216	.063	.005	.000	.000
	CAUSE_12	.014	.058	.057	.062	.144	.335	.025	.009	.004	.023
N	SCP1	25	25	25	25	25	25	25	25	25	25
	CAUSE_1	25	25	25	25	25	25	25	25	25	25
	CAUSE_2	25	25	25	25	25	25	25	25	25	25
	CAUSE_3	25	25	25	25	25	25	25	25	25	25
	CAUSE_4	25	25	25	25	25	25	25	25	25	25
	CAUSE_5	25	25	25	25	25	25	25	25	25	25
	CAUSE_6	25	25	25	25	25	25	25	25	25	25
	CAUSE_7	25	25	25	25	25	25	25	25	25	25
	CAUSE_8	25	25	25	25	25	25	25	25	25	25
	CAUSE_9	25	25	25	25	25	25	25	25	25	25
	CAUSE_10	25	25	25	25	25	25	25	25	25	25
	CAUSE_11	25	25	25	25	25	25	25	25	25	25
	CAUSE_12	25	25	25	25	25	25	25	25	25	25

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP1	.662	.564	.441
	CAUSE_1	.617	.452	.323
	CAUSE_2	.624	.413	.325
	CAUSE_3	.500	.555	.316
	CAUSE_4	.631	.530	.221
	CAUSE_5	.424	.165	-.090
	CAUSE_6	.414	.315	.396
	CAUSE_7	.404	.508	.466
	CAUSE_8	.665	.669	.522
	CAUSE_9	.718	.736	.401
	CAUSE_10	1.000	.737	.394
	CAUSE_11	.737	1.000	.731
	CAUSE_12	.394	.731	1.000
Sig. (1-tailed)	SCP1	.000	.002	.014
	CAUSE_1	.001	.012	.058
	CAUSE_2	.000	.020	.057
	CAUSE_3	.006	.002	.062
	CAUSE_4	.000	.003	.144
	CAUSE_5	.017	.216	.335
	CAUSE_6	.020	.063	.025
	CAUSE_7	.023	.005	.009
	CAUSE_8	.000	.000	.004
	CAUSE_9	.000	.000	.023
	CAUSE_10	.	.000	.026
	CAUSE_11	.000	.	.000
	CAUSE_12	.026	.000	.
N	SCP1	25	25	25
	CAUSE_1	25	25	25
	CAUSE_2	25	25	25
	CAUSE_3	25	25	25
	CAUSE_4	25	25	25
	CAUSE_5	25	25	25
	CAUSE_6	25	25	25
	CAUSE_7	25	25	25
	CAUSE_8	25	25	25
	CAUSE_9	25	25	25
	CAUSE_10	25	25	25
	CAUSE_11	25	25	25

Analysis for Ca-SCP1-CC

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	.755	1.314		.574	.576	-2.108	3.617			
	CAUSE_1	-4.111E-02	.372	-.057	-.110	.914	-.852	.769	.709	-.032	-.017
	CAUSE_2	.445	.432	.590	1.031	.323	-.495	1.386	.755	.285	.154
	CAUSE_3	-.145	.203	-.201	-.713	.489	-.586	.297	.471	-.202	-.107
	CAUSE_4	.220	.385	.310	.570	.579	-.620	1.059	.619	.162	.085
	CAUSE_5	-.185	.246	-.253	-.753	.466	-.720	.350	.371	-.212	-.113
	CAUSE_6	.153	.189	.212	.810	.434	-.258	.564	.498	.228	.121
	CAUSE_7	-3.860E-02	.194	-.048	-.199	.846	-.462	.385	.399	-.057	-.030
	CAUSE_8	.185	.280	.206	.662	.521	-.424	.794	.639	.188	.099
	CAUSE_9	.138	.261	.198	.527	.607	-.431	.706	.565	.151	.079
	CAUSE_10	-3.342E-02	.257	-.042	-.130	.899	-.594	.527	.662	-.037	-.019
	CAUSE_11	4.607E-02	.318	.071	.145	.887	-.647	.739	.564	.042	.022
	CAUSE_12	-3.155E-02	.230	-.045	-.137	.893	-.532	.469	.441	-.040	-.021
2	(Constant)	.757	1.263		.599	.559	-1.972	3.485			
	CAUSE_2	.410	.277	.543	1.477	.163	-.190	1.009	.755	.379	.212
	CAUSE_3	-.141	.192	-.195	-.733	.476	-.555	.273	.471	-.199	-.105
	CAUSE_4	.216	.369	.305	.586	.568	-.581	1.013	.619	.160	.084
	CAUSE_5	-.191	.230	-.261	-.828	.423	-.689	.307	.371	-.224	-.119
	CAUSE_6	.152	.181	.211	.838	.417	-.239	.543	.498	.226	.121
	CAUSE_7	-4.316E-02	.183	-.053	-.236	.817	-.438	.351	.399	-.065	-.034
	CAUSE_8	.192	.262	.214	.730	.478	-.375	.758	.639	.198	.105
	CAUSE_9	.136	.250	.196	.542	.597	-.405	.676	.565	.149	.078
	CAUSE_10	-3.064E-02	.246	-.038	-.124	.903	-.563	.501	.662	-.034	-.018
	CAUSE_11	4.098E-02	.303	.064	.135	.894	-.613	.695	.564	.038	.019
	CAUSE_12	-3.135E-02	.221	-.045	-.142	.889	-.509	.446	.441	-.039	-.020
3	(Constant)	.716	1.175		.609	.552	-1.805	3.236			
	CAUSE_2	.400	.256	.530	1.560	.141	-.150	.950	.755	.385	.216
	CAUSE_3	-.136	.181	-.188	-.750	.466	-.524	.252	.471	-.197	-.104
	CAUSE_4	.216	.356	.305	.608	.553	-.547	.979	.619	.160	.084
	CAUSE_5	-.193	.222	-.264	-.869	.399	-.668	.283	.371	-.226	-.121
	CAUSE_6	.149	.173	.207	.860	.404	-.222	.520	.498	.224	.119
	CAUSE_7	-4.251E-02	.176	-.052	-.242	.813	-.420	.335	.399	-.064	-.033
	CAUSE_8	.189	.252	.210	.749	.466	-.352	.729	.639	.196	.104
	CAUSE_9	.129	.236	.186	.547	.593	-.377	.635	.565	.145	.076
	CAUSE_11	2.554E-02	.266	.040	.096	.925	-.545	.597	.564	.026	.013
	CAUSE_12	-2.350E-02	.204	-.034	-.115	.910	-.461	.414	.441	-.031	-.016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	.681	1.082		.630	.538	-1.625	2.987			
	CAUSE_2	.386	.201	.511	1.915	.075	-.044	.815	.755	.443	.257
	CAUSE_3	-.136	.175	-.189	-.781	.447	-.509	.236	.471	-.198	-.105
	CAUSE_4	.237	.276	.334	.858	.404	-.351	.824	.619	.216	.115
	CAUSE_5	-.197	.211	-.269	-.933	.366	-.646	.253	.371	-.234	-.125
	CAUSE_6	.153	.162	.212	.944	.360	-.193	.498	.498	.237	.126
	CAUSE_7	-4.648E-02	.165	-.057	-.281	.782	-.399	.306	.399	-.072	-.038
	CAUSE_8	.187	.243	.209	.770	.453	-.331	.706	.639	.195	.103
	CAUSE_9	.144	.174	.207	.824	.423	-.228	.515	.565	.208	.110
	CAUSE_12	-8.845E-03	.131	-.013	-.068	.947	-.288	.270	.441	-.017	-.009
5	(Constant)	.663	1.016		.653	.523	-1.490	2.817			
	CAUSE_2	.385	.195	.510	1.977	.065	-.028	.797	.755	.443	.257
	CAUSE_3	-.137	.169	-.190	-.808	.431	-.495	.222	.471	-.198	-.105
	CAUSE_4	.233	.261	.328	.892	.386	-.320	.786	.619	.218	.116
	CAUSE_5	-.190	.182	-.260	-1.047	.311	-.575	.195	.371	-.253	-.136
	CAUSE_6	.149	.148	.207	1.008	.328	-.165	.463	.498	.244	.131
	CAUSE_7	-4.683E-02	.160	-.058	-.293	.773	-.386	.292	.399	-.073	-.038
	CAUSE_8	.185	.232	.206	.795	.438	-.308	.678	.639	.195	.103
	CAUSE_9	.144	.169	.207	.852	.407	-.214	.501	.565	.208	.111
6	(Constant)	.542	.903		.601	.556	-1.362	2.447			
	CAUSE_2	.384	.189	.509	2.029	.058	-.015	.783	.755	.441	.256
	CAUSE_3	-.153	.156	-.212	-.982	.340	-.481	.176	.471	-.232	-.124
	CAUSE_4	.229	.253	.323	.904	.379	-.306	.764	.619	.214	.114
	CAUSE_5	-.169	.162	-.232	-1.042	.312	-.511	.173	.371	-.245	-.132
	CAUSE_6	.133	.133	.185	.997	.333	-.148	.414	.498	.235	.126
	CAUSE_8	.194	.224	.217	.869	.397	-.278	.667	.639	.206	.110
	CAUSE_9	.124	.150	.178	.825	.421	-.193	.440	.565	.196	.104
7	(Constant)	.519	.894		.580	.569	-1.360	2.398			
	CAUSE_2	.390	.187	.516	2.080	.052	-.004	.784	.755	.440	.260
	CAUSE_3	-.155	.154	-.215	-1.007	.327	-.479	.169	.471	-.231	-.126
	CAUSE_4	.263	.248	.371	1.060	.303	-.258	.783	.619	.242	.133
	CAUSE_5	-.193	.158	-.265	-1.222	.237	-.525	.139	.371	-.277	-.153
	CAUSE_6	9.823E-02	.125	.136	.783	.444	-.165	.362	.498	.182	.098
	CAUSE_8	.324	.158	.361	2.054	.055	-.007	.656	.639	.436	.257

Analysis for Ca-SCP1-CC

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.855[a]	.732	.463	1.2109	.732	2.725	12	12	.048
2	.855[b]	.731	.504	1.1640	.000	.012	1	14	.914
3	.855[c]	.731	.539	1.1224	.000	.015	1	15	.903
4	.855[d]	.731	.569	1.0846	.000	.009	1	16	.925
5	.855[e]	.731	.596	1.0504	.000	.005	1	17	.947
6	.854[f]	.729	.618	1.0217	-.001	.086	1	18	.773
7	.848[g]	.718	.625	1.0126	-.011	.680	1	19	.421
8	.842[h]	.709	.632	1.0023	-.010	.614	1	20	.444
9	.835[i]	.697	.637	.9963	-.012	.762	1	21	.393
10	.832[j]	.691	.647	.9813	-.006	.374	1	22	.548
11	.825[k]	.681	.652	.9747	-.010	.703	1	23	.411

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_4
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_4
d. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_4
e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_4
f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_2, CAUSE_8, CAUSE_4
g. Predictors: (Constant), CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_2, CAUSE_8, CAUSE_4
h. Predictors: (Constant), CAUSE_5, CAUSE_3, CAUSE_2, CAUSE_8, CAUSE_4
i. Predictors: (Constant), CAUSE_5, CAUSE_3, CAUSE_2, CAUSE_8
j. Predictors: (Constant), CAUSE_3, CAUSE_2, CAUSE_8
k. Predictors: (Constant), CAUSE_2, CAUSE_8
l. Dependent Variable: SCP1

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.944	12	3.995	2.725	.048[a]
	Residual	17.596	12	1.466		
	Total	65.540	24			
2	Regression	47.926	11	4.357	3.216	.024[b]
	Residual	17.614	13	1.355		
	Total	65.540	24			

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	47.905	10	4.790	3.803	.012[c]
	Residual	17.635	14	1.260		
	Total	65.540	24			
4	Regression	47.893	9	5.321	4.523	.005[d]
	Residual	17.647	15	1.176		
	Total	65.540	24			
5	Regression	47.888	8	5.986	5.426	.002[e]
	Residual	17.652	16	1.103		
	Total	65.540	24			
6	Regression	47.793	7	6.828	6.540	.001[f]
	Residual	17.747	17	1.044		
	Total	65.540	24			
7	Regression	47.083	6	7.847	7.653	.000[g]
	Residual	18.457	18	1.025		
	Total	65.540	24			
8	Regression	46.454	5	9.291	9.249	.000[h]
	Residual	19.086	19	1.005		
	Total	65.540	24			
9	Regression	45.688	4	11.422	11.507	.000[i]
	Residual	19.852	20	.993		
	Total	65.540	24			
10	Regression	45.317	3	15.106	15.686	.000[j]
	Residual	20.223	21	.963		
	Total	65.540	24			
11	Regression	44.639	2	22.320	23.494	.000[k]
	Residual	20.901	22	.950		
	Total	65.540	24			

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_4
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_4
d. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_4
e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_4
f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_2, CAUSE_8, CAUSE_4
g. Predictors: (Constant), CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_2, CAUSE_8, CAUSE_4
h. Predictors: (Constant), CAUSE_5, CAUSE_3, CAUSE_2, CAUSE_8, CAUSE_4
i. Predictors: (Constant), CAUSE_5, CAUSE_3, CAUSE_2, CAUSE_8
j. Predictors: (Constant), CAUSE_3, CAUSE_2, CAUSE_8
k. Predictors: (Constant), CAUSE_2, CAUSE_8
l. Dependent Variable: SCP1

Analysis for Ca-SCP1-CC
Analysis for Ca-SCP1-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_2	.252	3.962
	CAUSE_3	.306	3.268
	CAUSE_4	.119	8.432
	CAUSE_5	.215	4.645
	CAUSE_6	.354	2.825
	CAUSE_7	.433	2.308
	CAUSE_8	.244	4.095
	CAUSE_9	.285	3.515
	CAUSE_12	.512	1.951
5	(Constant)		
	CAUSE_2	.253	3.946
	CAUSE_3	.306	3.267
	CAUSE_4	.124	8.043
	CAUSE_5	.272	3.675
	CAUSE_6	.398	2.515
	CAUSE_7	.434	2.306
	CAUSE_8	.250	3.993
	CAUSE_9	.285	3.514
6	(Constant)		
	CAUSE_2	.253	3.945
	CAUSE_3	.342	2.923
	CAUSE_4	.125	8.025
	CAUSE_5	.323	3.098
	CAUSE_6	.464	2.154
	CAUSE_8	.256	3.911
	CAUSE_9	.341	2.935
7	(Constant)		
	CAUSE_2	.254	3.939
	CAUSE_3	.342	2.922
	CAUSE_4	.128	7.816
	CAUSE_5	.334	2.997
	CAUSE_6	.516	1.940
	CAUSE_8	.505	1.980

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	.546	.884		.618	.544	-1.305	2.397			
	CAUSE_2	.437	.176	.579	2.488	.022	.069	.805	.755	.496	.308
	CAUSE_3	-.166	.152	-.231	-1.096	.287	-.485	.152	.471	-.244	-.136
	CAUSE_4	.204	.234	.288	.873	.393	-.285	.694	.619	.196	.108
	CAUSE_5	-.140	.141	-.191	-.990	.335	-.435	.156	.371	-.221	-.123
	CAUSE_8	.383	.137	.428	2.798	.011	.097	.670	.639	.540	.346
9	(Constant)	.454	.873		.520	.609	-1.367	2.274			
	CAUSE_2	.531	.138	.704	3.859	.001	.244	.819	.755	.653	.475
	CAUSE_3	-8.610E-02	.120	-.119	-.716	.482	-.337	.165	.471	-.158	-.088
	CAUSE_5	-7.141E-02	.117	-.098	-.612	.548	-.315	.172	.371	-.136	-.075
	CAUSE_8	.363	.134	.405	2.704	.014	.083	.643	.639	.517	.333
10	(Constant)	.262	.802		.326	.747	-1.407	1.931			
	CAUSE_2	.488	.116	.647	4.193	.000	.246	.730	.755	.675	.508
	CAUSE_3	-9.797E-02	.117	-.136	-.839	.411	-.341	.145	.471	-.180	-.102
	CAUSE_8	.376	.131	.419	2.875	.009	.104	.647	.639	.531	.348
11	(Constant)	.177	.791		.224	.825	-1.463	1.816			
	CAUSE_2	.442	.102	.585	4.338	.000	.231	.653	.755	.679	.522
	CAUSE_8	.336	.121	.375	2.777	.011	.095	.597	.639	.509	.334

Analysis for Ca-SCP1-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.283	3.532
	CAUSE_3	.345	2.896
	CAUSE_4	.141	7.109
	CAUSE_5	.411	2.434
	CAUSE_8	.656	1.524
9	(Constant)		
	CAUSE_2	.455	2.197
	CAUSE_3	.545	1.833
	CAUSE_5	.592	1.689
	CAUSE_8	.676	1.479
10	(Constant)		
	CAUSE_2	.618	1.618
	CAUSE_3	.560	1.786
	CAUSE_8	.692	1.444
11	(Constant)		
	CAUSE_2	.796	1.256
	CAUSE_8	.796	1.256

a. Dependent Variable: SCP1

Analysis for Ca-SCP1-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.084	11.893
	CAUSE_2	.068	14.614
	CAUSE_3	.283	3.532
	CAUSE_4	.076	13.197
	CAUSE_5	.198	5.056
	CAUSE_6	.326	3.070
	CAUSE_7	.390	2.561
	CAUSE_8	.230	4.342
	CAUSE_9	.158	6.328
	CAUSE_10	.219	4.569
	CAUSE_11	.092	10.874
	CAUSE_12	.207	4.827
2	(Constant)		
	CAUSE_2	.153	6.532
	CAUSE_3	.293	3.414
	CAUSE_4	.076	13.108
	CAUSE_5	.207	4.822
	CAUSE_6	.327	3.061
	CAUSE_7	.409	2.446
	CAUSE_8	.241	4.141
	CAUSE_9	.159	6.300
	CAUSE_10	.221	4.525
	CAUSE_11	.094	10.647
	CAUSE_12	.207	4.827
3	(Constant)		
	CAUSE_2	.167	6.001
	CAUSE_3	.305	3.274
	CAUSE_4	.076	13.108
	CAUSE_5	.208	4.798
	CAUSE_6	.332	3.009
	CAUSE_7	.409	2.444
	CAUSE_8	.244	4.106
	CAUSE_9	.166	6.009
	CAUSE_11	.113	8.858
	CAUSE_12	[illegible]	[illegible]

SPSS regression printouts for SCP2 analysis

Correlations

		CAUSE10	CAUSE11	CAUSE12
Pearson Correlation	SCP2	.387	.318	.103
	CAUSE1	.308	.361	.247
	CAUSE2	.352	.405	.129
	CAUSE3	.335	.353	.203
	CAUSE4	.479	.428	.172
	CAUSE5	.433	.320	.158
	CAUSE6	.288	.294	.287
	CAUSE7	.276	.488	.262
	CAUSE8	.448	.646	.407
	CAUSE9	.412	.638	.350
	CAUSE10	1.000	.583	.397
	CAUSE11	.583	1.000	.469
	CAUSE12	.397	.469	1.000
Sig. (1-tailed)	SCP2	.000	.000	.075
	CAUSE1	.000	.000	.000
	CAUSE2	.000	.000	.036
	CAUSE3	.000	.000	.002
	CAUSE4	.000	.000	.008
	CAUSE5	.000	.000	.014
	CAUSE6	.000	.000	.000
	CAUSE7	.000	.000	.000
	CAUSE8	.000	.000	.000
	CAUSE9	.000	.000	.000
	CAUSE10	.	.000	.000
	CAUSE11	.000	.	.000
	CAUSE12	.000	.000	.
N	SCP2	196	196	196
	CAUSE1	196	196	196
	CAUSE2	196	196	196
	CAUSE3	196	196	196
	CAUSE4	196	196	196
	CAUSE5	196	196	196
	CAUSE6	196	196	196
	CAUSE7	196	196	196
	CAUSE8	196	196	196
	CAUSE9	196	196	196
	CAUSE10	196	196	196
	CAUSE11	196	196	196
	CAUSE12	196	196	196

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4[a]	.	Enter
2	.	CAUSE1	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE6	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE7	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE2	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE9	Backward (criterion: Probability of F-to-remove >= .100).

Régression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP2	4.727	1.5185	196
CAUSE1	6.138	1.9888	196
CAUSE2	5.574	1.9848	196
CAUSE3	5.648	1.9971	196
CAUSE4	5.640	2.0209	196
CAUSE5	5.497	1.9933	196
CAUSE6	5.128	1.9372	196
CAUSE7	5.273	2.0276	196
CAUSE8	6.171	1.9229	196
CAUSE9	6.298	2.1830	196
CAUSE10	5.939	1.7712	196
CAUSE11	5.329	2.0103	196
CAUSE12	5.617	1.9517	196

Correlations

		SCP2	CAUSE1	CAUSE2	CAUSE3	CAUSE4	CAUSE5	CAUSE6	CAUSE7	CAUSE8	CAUSE9
Pearson Correlation	SCP2	1.000	.352	.432	.418	.505	.486	.314	.278	.306	.209
	CAUSE1	.352	1.000	.756	.568	.564	.548	.497	.399	.466	.414
	CAUSE2	.432	.756	1.000	.636	.706	.596	.462	.420	.440	.337
	CAUSE3	.418	.568	.636	1.000	.638	.580	.478	.472	.374	.367
	CAUSE4	.505	.564	.706	.638	1.000	.730	.462	.427	.384	.308
	CAUSE5	.486	.548	.596	.580	.730	1.000	.565	.316	.370	.226
	CAUSE6	.314	.497	.462	.478	.462	.565	1.000	.502	.443	.361
	CAUSE7	.278	.399	.420	.472	.427	.316	.502	1.000	.566	.472
	CAUSE8	.306	.466	.440	.374	.384	.370	.443	.566	1.000	.634
	CAUSE9	.209	.414	.337	.367	.308	.226	.361	.472	.634	1.000
	CAUSE10	.387	.308	.352	.335	.479	.433	.288	.276	.448	.412
	CAUSE11	.318	.361	.405	.353	.428	.320	.294	.488	.646	.638
	CAUSE12	.103	.247	.129	.203	.172	.158	.287	.262	.407	.350
Sig. (1-tailed)	SCP2	.	.000	.000	.000	.000	.000	.000	.000	.000	.002
	CAUSE1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE5	.000	.000	.000	.000	.000	.	.000	.000	.000	.001
	CAUSE6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE9	.002	.000	.000	.000	.000	.001	.000	.000	.000	.
	CAUSE10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE12	.075	.000	.036	.002	.008	.014	.000	.000	.000	.000
N	SCP2	196	196	196	196	196	196	196	196	196	196
	CAUSE1	196	196	196	196	196	196	196	196	196	196
	CAUSE2	196	196	196	196	196	196	196	196	196	196
	CAUSE3	196	196	196	196	196	196	196	196	196	196
	CAUSE4	196	196	196	196	196	196	196	196	196	196
	CAUSE5	196	196	196	196	196	196	196	196	196	196
	CAUSE6	196	196	196	196	196	196	196	196	196	196
	CAUSE7	196	196	196	196	196	196	196	196	196	196
	CAUSE8	196	196	196	196	196	196	196	196	196	196
	CAUSE9	196	196	196	196	196	196	196	196	196	196
	CAUSE10	196	196	196	196	196	196	196	196	196	196
	CAUSE11	196	196	196	196	196	196	196	196	196	196
	CAUSE12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Total	449.647	195			
5	Regression	145.169	8	18.146	11.145	.000[e]
	Residual	304.477	187	1.628		
	Total	449.647	195			
6	Regression	144.084	7	20.583	12.664	.000[f]
	Residual	305.563	188	1.625		
	Total	449.647	195			
7	Regression	143.531	6	23.922	14.770	.000[g]
	Residual	306.116	189	1.620		
	Total	449.647	195			
8	Regression	141.819	5	28.364	17.507	.000[h]
	Residual	307.828	190	1.620		
	Total	449.647	195			
9	Regression	140.358	4	35.090	21.669	.000[i]
	Residual	309.289	191	1.619		
	Total	449.647	195			
10	Regression	136.858	3	45.619	28.003	.000[j]
	Residual	312.789	192	1.629		
	Total	449.647	195			

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4

b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

e. Predictors: (Constant), CAUSE12, CAUSE9, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

f. Predictors: (Constant), CAUSE12, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

g. Predictors: (Constant), CAUSE12, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE4

h. Predictors: (Constant), CAUSE12, CAUSE10, CAUSE3, CAUSE5, CAUSE4

i. Predictors: (Constant), CAUSE10, CAUSE3, CAUSE5, CAUSE4

j. Predictors: (Constant), CAUSE10, CAUSE5, CAUSE4

k. Dependent Variable: SCP2

Model	Variables Entered	Variables Removed	Method
	.	CAUSE11	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE8	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE12	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE3	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP2

Analysis for Ca-SCP2-AR

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	1.781	.424		4.204	.000	.945	2.617			
	CAUSE1	-6.772E-03	.077	-.009	-.087	.930	-.160	.146	.352	-.006	-.005
	CAUSE2	4.618E-02	.087	.060	.529	.597	-.126	.218	.432	.039	.032
	CAUSE3	8.139E-02	.068	.107	1.192	.235	-.053	.216	.418	.088	.072
	CAUSE4	.122	.082	.162	1.477	.141	-.041	.284	.505	.109	.090
	CAUSE5	.133	.078	.174	1.704	.090	-.021	.286	.486	.125	.104
	CAUSE6	9.927E-03	.067	.013	.149	.882	-.122	.142	.314	.011	.009
	CAUSE7	1.119E-02	.063	.015	.176	.860	-.114	.136	.278	.013	.011
	CAUSE8	4.985E-02	.075	.063	.662	.509	-.099	.198	.306	.049	.040
	CAUSE9	-4.980E-02	.062	-.072	-.799	.426	-.173	.073	.209	-.059	-.049
	CAUSE10	.141	.071	.165	1.996	.047	.002	.281	.387	.146	.121
	CAUSE11	5.506E-02	.076	.073	.726	.469	-.095	.205	.318	.054	.044
	CAUSE12	-6.793E-02	.058	-.087	-1.180	.239	-.181	.046	.103	-.087	-.072
2	(Constant)	1.778	.420		4.229	.000	.948	2.607			
	CAUSE2	4.197E-02	.073	.055	.578	.564	-.101	.185	.432	.043	.035
	CAUSE3	8.103E-02	.068	.107	1.192	.235	-.053	.215	.418	.088	.072
	CAUSE4	.122	.082	.162	1.486	.139	-.040	.284	.505	.109	.090
	CAUSE5	.132	.077	.173	1.711	.089	-.020	.284	.486	.125	.104
	CAUSE6	9.449E-03	.066	.012	.143	.887	-.121	.140	.314	.011	.009
	CAUSE7	1.131E-02	.063	.015	.179	.858	-.113	.136	.278	.013	.011
	CAUSE8	4.935E-02	.075	.062	.659	.511	-.098	.197	.306	.049	.040
	CAUSE9	-5.082E-02	.061	-.073	-.832	.407	-.171	.070	.209	-.061	-.050
	CAUSE10	.142	.070	.165	2.012	.046	.003	.280	.387	.147	.122
	CAUSE11	5.583E-02	.075	.074	.743	.458	-.092	.204	.318	.055	.045
	CAUSE12	-6.875E-02	.057	-.088	-1.214	.226	-.180	.043	.103	-.089	-.074
3	(Constant)	1.778	.419		4.242	.000	.951	2.605			
	CAUSE2	4.285E-02	.072	.056	.594	.553	-.099	.185	.432	.044	.036
	CAUSE3	8.142E-02	.068	.107	1.202	.231	-.052	.215	.418	.088	.073
	CAUSE4	.121	.082	.162	1.484	.139	-.040	.283	.505	.108	.090
	CAUSE5	.136	.072	.178	1.901	.059	-.005	.277	.486	.138	.115
	CAUSE7	1.395E-02	.060	.019	.231	.817	-.105	.133	.278	.017	.014
	CAUSE8	5.014E-02	.074	.063	.673	.502	-.097	.197	.306	.049	.041
	CAUSE9	-4.968E-02	.060	-.071	-.822	.412	-.169	.069	.209	-.060	-.050
	CAUSE10	.141	.070	.165	2.014	.045	.003	.280	.387	.146	.122
	CAUSE11	5.391E-02	.074	.071	.731	.466	-.092	.199	.318	.054	.044
	CAUSE12	-6.723E-02	.055	-.086	-1.232	.227	-.177	.042	.103	-.089	-.073

Analysis for Ca-SCP2-AR

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.570[a]	.324	.280	1.2884	.324	7.324	12	183	.000
2	.570[b]	.324	.284	1.2849	.000	.008	1	185	.930
3	.570[c]	.324	.288	1.2815	.000	.020	1	186	.887
4	.569[d]	.324	.291	1.2782	.000	.054	1	187	.817
5	.568[e]	.323	.294	1.2760	-.001	.355	1	188	.552
6	.566[f]	.320	.295	1.2749	-.002	.667	1	189	.415
7	.565[g]	.319	.298	1.2727	-.001	.340	1	190	.560
8	.562[h]	.315	.297	1.2729	-.004	1.057	1	191	.305
9	.559[i]	.312	.298	1.2725	-.003	.901	1	192	.344
10	.552[j]	.304	.293	1.2764	-.008	2.162	1	193	.143

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4

b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

e. Predictors: (Constant), CAUSE12, CAUSE9, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

f. Predictors: (Constant), CAUSE12, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4

g. Predictors: (Constant), CAUSE12, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE4

h. Predictors: (Constant), CAUSE12, CAUSE10, CAUSE3, CAUSE5, CAUSE4

i. Predictors: (Constant), CAUSE10, CAUSE3, CAUSE5, CAUSE4

j. Predictors: (Constant), CAUSE10, CAUSE5, CAUSE4

k. Dependent Variable: SCP2

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145.883	12	12.157	7.324	.000[a]
	Residual	303.764	183	1.660		
	Total	449.647	195			
2	Regression	145.870	11	13.261	8.032	.000[b]
	Residual	303.777	184	1.651		
	Total	449.647	195			
3	Regression	145.836	10	14.584	8.880	.000[c]
	Residual	303.810	185	1.642		
	Total	449.647	195			

Analysis for Ca-SCP2-AR

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE1	.359	2.785
	CAUSE2	.284	3.520
	CAUSE3	.457	2.186
	CAUSE4	.307	3.261
	CAUSE5	.353	2.833
	CAUSE6	.510	1.961
	CAUSE7	.515	1.942
	CAUSE8	.406	2.462
	CAUSE9	.459	2.177
	CAUSE10	.543	1.841
	CAUSE11	.366	2.732
	CAUSE12	.675	1.482
2	(Constant)		
	CAUSE2	.408	2.450
	CAUSE3	.459	2.178
	CAUSE4	.307	3.255
	CAUSE5	.359	2.787
	CAUSE6	.513	1.948
	CAUSE7	.515	1.942
	CAUSE8	.408	2.448
	CAUSE9	.476	2.101
	CAUSE10	.546	1.833
	CAUSE11	.371	2.695
	CAUSE12	.693	1.443
3	(Constant)		
	CAUSE2	.411	2.432
	CAUSE3	.460	2.175
	CAUSE4	.308	3.243
	CAUSE5	.415	2.412
	CAUSE7	.563	1.775
	CAUSE8	.411	2.435
	CAUSE9	.484	2.065
	CAUSE10	.546	1.831
	CAUSE11	.383	2.609
	CAUSE12	.719	1.391

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	1.788	.416		4.297	.000	.967	2.608			
	CAUSE2	4.283E-02	.072	.056	.595	.552	-.099	.185	.432	.044	.036
	CAUSE3	8.482E-02	.066	.112	1.285	.200	-.045	.215	.418	.094	.077
	CAUSE4	.124	.081	.165	1.534	.127	-.035	.283	.505	.112	.092
	CAUSE5	.135	.071	.177	1.893	.060	-.006	.275	.486	.137	.114
	CAUSE8	5.525E-02	.071	.070	.779	.437	-.085	.195	.306	.057	.047
	CAUSE9	-4.858E-02	.060	-.070	-.809	.420	-.167	.070	.209	-.059	-.049
	CAUSE10	.139	.069	.162	2.006	.046	.002	.276	.387	.146	.121
	CAUSE11	5.605E-02	.073	.074	.768	.443	-.088	.200	.318	.056	.046
	CAUSE12	-6.712E-02	.055	-.086	-1.213	.226	-.176	.042	.103	-.089	-.073
5	(Constant)	1.820	.412		4.418	.000	1.007	2.632			
	CAUSE3	9.630E-02	.063	.127	1.529	.128	-.028	.221	.418	.111	.092
	CAUSE4	.142	.075	.188	1.883	.061	-.007	.290	.505	.136	.113
	CAUSE5	.138	.071	.182	1.959	.052	-.001	.278	.486	.142	.118
	CAUSE8	6.246E-02	.070	.079	.895	.372	-.075	.200	.306	.065	.054
	CAUSE9	-4.895E-02	.060	-.070	-.816	.415	-.167	.069	.209	-.060	-.049
	CAUSE10	.136	.069	.159	1.975	.050	.000	.273	.387	.143	.119
	CAUSE11	5.934E-02	.073	.079	.817	.415	-.084	.203	.318	.060	.049
	CAUSE12	-7.101E-02	.055	-.091	-1.295	.197	-.179	.037	.103	-.094	-.078
6	(Constant)	1.765	.406		4.346	.000	.964	2.565			
	CAUSE3	8.664E-02	.062	.114	1.402	.163	-.035	.209	.418	.102	.084
	CAUSE4	.143	.075	.191	1.910	.058	-.005	.291	.505	.138	.115
	CAUSE5	.145	.070	.191	2.071	.040	.007	.283	.486	.149	.125
	CAUSE8	4.180E-02	.065	.053	.643	.521	-.086	.170	.306	.047	.039
	CAUSE10	.134	.069	.156	1.940	.054	-.002	.270	.387	.140	.117
	CAUSE11	4.003E-02	.069	.053	.583	.560	-.095	.175	.318	.043	.035
	CAUSE12	-7.099E-02	.055	-.091	-1.296	.197	-.179	.037	.103	-.094	-.078
7	(Constant)	1.736	.402		4.315	.000	.942	2.529			
	CAUSE3	8.784E-02	.062	.116	1.424	.156	-.034	.210	.418	.103	.085
	CAUSE4	.150	.074	.200	2.035	.043	.005	.296	.505	.146	.122
	CAUSE5	.140	.069	.183	2.015	.045	.003	.277	.486	.145	.121
	CAUSE8	5.922E-02	.058	.075	1.028	.305	-.054	.173	.306	.075	.062
	CAUSE10	.147	.065	.171	2.262	.025	.019	.275	.387	.162	.136
	CAUSE12	-6.404E-02	.053	-.082	-1.200	.232	-.169	.041	.103	-.087	-.072

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE2	.411	2.432
	CAUSE3	.482	2.073
	CAUSE4	.314	3.184
	CAUSE5	.417	2.396
	CAUSE8	.450	2.221
	CAUSE9	.487	2.052
	CAUSE10	.555	1.800
	CAUSE11	.389	2.568
	CAUSE12	.719	1.391
5	(Constant)		
	CAUSE3	.528	1.896
	CAUSE4	.362	2.761
	CAUSE5	.421	2.376
	CAUSE8	.464	2.156
	CAUSE9	.487	2.052
	CAUSE10	.558	1.793
	CAUSE11	.392	2.553
	CAUSE12	.729	1.372
6	(Constant)		
	CAUSE3	.547	1.829
	CAUSE4	.363	2.758
	CAUSE5	.427	2.343
	CAUSE8	.534	1.872
	CAUSE10	.559	1.789
	CAUSE11	.438	2.282
	CAUSE12	.729	1.372
7	(Constant)		
	CAUSE3	.547	1.827
	CAUSE4	.372	2.686
	CAUSE5	.434	2.302
	CAUSE8	.677	1.477
	CAUSE10	.627	1.594
	CAUSE12	.765	1.307

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	1.831	.391		4.679	.000	1.059	2.603			
	CAUSE3	9.614E-02	.061	.126	1.572	.118	-.025	.217	.418	.113	.094
	CAUSE4	.154	.074	.205	2.090	.038	.009	.300	.505	.150	.125
	CAUSE5	.145	.069	.191	2.103	.037	.009	.282	.486	.151	.126
	CAUSE10	.161	.064	.188	2.535	.012	.036	.286	.387	.181	.152
	CAUSE12	-4.866E-02	.051	-.063	-.949	.344	-.150	.052	.103	-.069	-.057
9	(Constant)	1.693	.363		4.661	.000	.977	2.409			
	CAUSE3	8.926E-02	.061	.117	1.470	.143	-.030	.209	.418	.106	.088
	CAUSE4	.158	.074	.211	2.150	.033	.013	.304	.505	.154	.129
	CAUSE5	.147	.069	.193	2.131	.034	.011	.284	.486	.152	.128
	CAUSE10	.139	.059	.162	2.351	.020	.022	.256	.387	.168	.141
10	(Constant)	1.844	.349		5.280	.000	1.155	2.534			
	CAUSE4	.199	.069	.264	2.894	.004	.063	.334	.505	.204	.174
	CAUSE5	.169	.068	.222	2.494	.013	.035	.303	.486	.177	.150
	CAUSE10	.140	.059	.164	2.364	.019	.023	.257	.387	.168	.142

		SCP2	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP2	1.000	.508	.489	.458	.573	.585	-.028	.303	.259	.315
	CAUSE_1	.508	1.000	.850	.628	.625	.540	.224	.433	.436	.416
	CAUSE_2	.489	.850	1.000	.622	.759	.595	.164	.564	.530	.543
	CAUSE_3	.458	.628	.622	1.000	.598	.633	.211	.426	.379	.350
	CAUSE_4	.573	.625	.759	.598	1.000	.785	.285	.548	.447	.549
	CAUSE_5	.585	.540	.595	.633	.785	1.000	.274	.378	.389	.396
	CAUSE_6	-.028	.224	.164	.211	.285	.274	1.000	.282	.234	.159
	CAUSE_7	.303	.433	.564	.426	.548	.378	.282	1.000	.694	.552
	CAUSE_8	.259	.436	.530	.379	.447	.389	.234	.694	1.000	.784
	CAUSE_9	.315	.416	.543	.350	.549	.396	.159	.552	.784	1.000
	CAUSE_10	.196	.253	.309	.185	.359	.327	.086	.393	.664	.694
	CAUSE_11	.303	.341	.456	.217	.400	.340	.044	.524	.797	.760
	CAUSE_12	-.054	.248	.108	.092	.088	.168	.099	.110	.396	.372
Sig. (1-tailed)	SCP2	.	.000	.000	.000	.000	.000	.419	.012	.028	.010
	CAUSE_1	.000	.	.000	.000	.000	.000	.050	.000	.000	.001
	CAUSE_2	.000	.000	.	.000	.000	.000	.116	.000	.000	.00[illegible]
	CAUSE_3	.000	.000	.000	.	.000	.000	.061	.001	.002	.004
	CAUSE_4	.000	.000	.000	.000	.	.000	.017	.000	.000	.00[illegible]
	CAUSE_5	.000	.000	.000	.000	.000	.	.022	.002	.002	.00[illegible]
	CAUSE_6	.419	.050	.116	.061	.017	.022	.	.019	.043	.12[illegible]
	CAUSE_7	.012	.000	.000	.001	.000	.002	.019	.	.000	.00[illegible]
	CAUSE_8	.028	.000	.000	.002	.000	.002	.043	.000	.	.00[illegible]
	CAUSE_9	.010	.001	.000	.004	.000	.001	.123	.000	.000	.
	CAUSE_10	.076	.031	.011	.088	.004	.007	.267	.000	.000	.00[illegible]
	CAUSE_11	.012	.005	.000	.056	.001	.006	.375	.001	.000	.00[illegible]
	CAUSE_12	.348	.034	.217	.251	.263	.110	.236	.212	.001	.003
N	SCP2	55	55	55	55	55	55	55	55	55	55
	CAUSE_1	55	55	55	55	55	55	55	55	55	55
	CAUSE_2	55	55	55	55	55	55	55	55	55	55
	CAUSE_3	55	55	55	55	55	55	55	55	55	55
	CAUSE_4	55	55	55	55	55	55	55	55	55	55
	CAUSE_5	55	55	55	55	55	55	55	55	55	55
	CAUSE_6	55	55	55	55	55	55	55	55	55	55
	CAUSE_7	55	55	55	55	55	55	55	55	55	55
	CAUSE_8	55	55	55	55	55	55	55	55	55	55
	CAUSE_9	55	55	55	55	55	55	55	55	55	55
	CAUSE_10	55	55	55	55	55	55	55	55	55	55
	CAUSE_11	55	55	55	55	55	55	55	55	55	55
	CAUSE_12	55	55	55	55	55	55	55	55	55	55

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP2	.196	.303	-.054
	CAUSE_1	.253	.341	.248
	CAUSE_2	.309	.456	.108
	CAUSE_3	.185	.217	.092
	CAUSE_4	.359	.400	.088
	CAUSE_5	.327	.340	.168
	CAUSE_6	.086	.044	.099
	CAUSE_7	.393	.524	.110
	CAUSE_8	.664	.797	.396
	CAUSE_9	.694	.760	.372
	CAUSE_10	1.000	.724	.544
	CAUSE_11	.724	1.000	.370
	CAUSE_12	.544	.370	1.000
Sig. (1-tailed)	SCP2	.076	.012	.348
	CAUSE_1	.031	.005	.034
	CAUSE_2	.011	.000	.217
	CAUSE_3	.088	.056	.251
	CAUSE_4	.004	.001	.263
	CAUSE_5	.007	.006	.110
	CAUSE_6	.267	.375	.236
	CAUSE_7	.001	.000	.212
	CAUSE_8	.000	.000	.001
	CAUSE_9	.000	.000	.003
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.003
	CAUSE_12	.000	.003	.
N	SCP2	55	55	55
	CAUSE_1	55	55	55
	CAUSE_2	55	55	55
	CAUSE_3	55	55	55
	CAUSE_4	55	55	55
	CAUSE_5	55	55	55
	CAUSE_6	55	55	55
	CAUSE_7	55	55	55
	CAUSE_8	55	55	55
	CAUSE_9	55	55	55
	CAUSE_10	55	55	55
	CAUSE_11	55	55	55
	CAUSE_12	55	55	55

Model		Tolerance	VIF
8	(Constant)		
	CAUSE3	.557	1.795
	CAUSE4	.373	2.679
	CAUSE5	.437	2.288
	CAUSE10	.656	1.524
	CAUSE12	.830	1.204
9	(Constant)		
	CAUSE3	.565	1.770
	CAUSE4	.375	2.670
	CAUSE5	.437	2.286
	CAUSE10	.755	1.324
10	(Constant)		
	CAUSE4	.434	2.302
	CAUSE5	.458	2.182
	CAUSE10	.755	1.324

a. Dependent Variable: SCP2

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP2	5.118	1.5335	55
CAUSE_1	5.391	2.2396	55
CAUSE_2	5.464	2.1897	55
CAUSE_3	5.400	2.2307	55
CAUSE_4	5.764	2.4092	55
CAUSE_5	5.500	2.2812	55
CAUSE_6	5.655	9.0615	55
CAUSE_7	4.600	2.4578	55
CAUSE_8	5.482	2.2770	55
CAUSE_9	4.809	2.1398	55
CAUSE_10	6.400	1.9940	55
CAUSE_11	4.891	2.3935	55
CAUSE_12	5.245	2.2564	55

Model Summary[j]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.729[a]	.532	.398	1.1898	.532	3.975	12	42	.000
2	.729[b]	.532	.412	1.1759	.000	.000	1	44	.984
3	.729[c]	.532	.425	1.1626	.000	.014	1	45	.906
4	.728[d]	.531	.437	1.1508	-.001	.087	1	46	.770
5	.728[e]	.530	.448	1.1388	-.001	.048	1	47	.827
6	.727[f]	.529	.459	1.1280	-.001	.110	1	48	.742
7	.714[g]	.510	.448	1.1388	-.019	1.928	1	49	.172
8	.702[h]	.493	.441	1.1463	-.017	1.650	1	50	.205
9	.692[i]	.479	.438	1.1500	-.014	1.319	1	51	.256

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_2
f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_2
g. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_2
h. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5
i. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_1, CAUSE_5
j. Dependent Variable: SCP2

ANOVA[j]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	67.528	12	5.627	3.975	.000[a]
	Residual	59.454	42	1.416		
	Total	126.982	54			
2	Regression	67.527	11	6.139	4.440	.000[b]
	Residual	59.455	43	1.383		
	Total	126.982	54			
3	Regression	67.508	10	6.751	4.994	.000[c]
	Residual	59.474	44	1.352		
	Total	126.982	54			
4	Regression	67.390	9	7.488	5.654	.000[d]
	Residual	59.592	45	1.324		
	Total	126.982	54			
5	Regression	67.326	8	8.416	6.489	.000[e]
	Residual	59.656	46	1.297		
	Total	126.982	54			
6	Regression	67.184	7	9.598	7.544	.000[f]
	Residual	59.798	47	1.272		
	Total	126.982	54			
7	Regression	64.731	6	10.789	8.319	.000[g]
	Residual	62.250	48	1.297		
	Total	126.982	54			
8	Regression	62.591	5	12.518	9.526	.000[h]
	Residual	64.391	49	1.314		
	Total	126.982	54			
9	Regression	60.858	4	15.215	11.505	.000[i]
	Residual	66.124	50	1.322		
	Total	126.982	54			

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_2
f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_2
g. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5, CAUSE_2
h. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_11, CAUSE_1, CAUSE_5

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2	.	Enter
2	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP2

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	2.862	.537		5.331	.000	1.783	3.940			
	CAUSE_1	.217	.086	.317	2.534	.015	.045	.389	.508	.340	.258
	CAUSE_5	.313	.085	.466	3.702	.001	.143	.483	.585	.468	.377
	CAUSE_6	-3.536E-02	.018	-.209	-1.957	.056	-.072	.001	-.028	-.269	-.199
	CAUSE_11	8.583E-02	.075	.134	1.148	.256	-.064	.236	.303	.162	.117
	CAUSE_12	-.163	.075	-.240	-2.165	.035	-.314	-.012	-.054	-.295	-.220
9	(Constant)	2.957	.532		5.556	.000	1.888	4.025			
	CAUSE_1	.232	.085	.339	2.735	.009	.062	.403	.508	.361	.279
	CAUSE_5	.333	.083	.496	4.014	.000	.167	.500	.585	.494	.410
	CAUSE_6	-3.726E-02	.018	-.220	-2.064	.044	-.074	-.001	-.028	-.280	-.211
	CAUSE_12	-.136	.072	-.200	-1.893	.064	-.280	.008	-.054	-.259	-.193

Analysis for Ca-SCP2-MC

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	2.939	.665		4.422	.000	1.598	4.281			
	CAUSE_1	.392	.157	.573	2.506	.016	.076	.708	.508	.361	.265
	CAUSE_2	-.319	.191	-.456	-1.672	.102	-.705	.066	.489	-.250	-.177
	CAUSE_3	1.296E-02	.109	.019	.118	.906	-.208	.234	.458	.018	.013
	CAUSE_4	.152	.152	.239	1.001	.323	-.155	.459	.573	.153	.106
	CAUSE_5	.258	.130	.383	1.985	.054	-.004	.519	.585	.293	.210
	CAUSE_6	-4.160E-02	.020	-.246	-2.060	.046	-.082	-.001	-.028	-.303	-.217
	CAUSE_7	2.879E-02	.105	.046	.274	.785	-.183	.241	.303	.042	.029
	CAUSE_8	-5.543E-02	.164	-.082	-.337	.738	-.387	.277	.259	-.052	-.036
	CAUSE_9	5.678E-02	.149	.079	.380	.706	-.245	.358	.315	.059	.040
	CAUSE_10	2.873E-03	.140	.004	.021	.984	-.279	.285	.196	.003	.002
	CAUSE_11	.114	.135	.178	.841	.405	-.159	.387	.303	.129	.089
	CAUSE_12	-.190	.095	-.280	-1.996	.052	-.382	.002	-.054	-.294	-.211
2	(Constant)	2.946	.581		5.074	.000	1.775	4.117			
	CAUSE_1	.392	.154	.573	2.538	.015	.081	.704	.508	.361	.265
	CAUSE_2	-.320	.188	-.456	-1.699	.097	-.699	.060	.489	-.251	-.177
	CAUSE_3	1.289E-02	.108	.019	.119	.906	-.205	.231	.458	.018	.012
	CAUSE_4	.153	.150	.240	1.020	.314	-.149	.454	.573	.154	.106
	CAUSE_5	.258	.128	.383	2.012	.051	-.001	.516	.585	.293	.210
	CAUSE_6	-4.162E-02	.020	-.246	-2.087	.043	-.082	-.001	-.028	-.303	-.218
	CAUSE_7	2.876E-02	.104	.046	.277	.783	-.181	.238	.303	.042	.029
	CAUSE_8	-5.517E-02	.162	-.082	-.340	.735	-.382	.272	.259	-.052	-.036
	CAUSE_9	5.745E-02	.144	.080	.399	.692	-.233	.348	.315	.061	.042
	CAUSE_11	.115	.127	.179	.905	.370	-.141	.370	.303	.137	.094
	CAUSE_12	-.189	.087	-.279	-2.173	.035	-.365	-.014	-.054	-.315	-.227
3	(Constant)	2.960	.562		5.266	.000	1.827	4.093			
	CAUSE_1	.397	.148	.579	2.677	.010	.098	.695	.508	.374	.276
	CAUSE_2	-.319	.186	-.455	-1.716	.093	-.694	.056	.489	-.250	-.177
	CAUSE_4	.152	.148	.239	1.028	.310	-.146	.450	.573	.153	.106
	CAUSE_5	.263	.118	.391	2.224	.031	.025	.502	.585	.318	.229
	CAUSE_6	-4.177E-02	.020	-.247	-2.122	.039	-.081	-.002	-.028	-.305	-.219
	CAUSE_7	3.006E-02	.102	.048	.295	.770	-.176	.236	.303	.044	.030
	CAUSE_8	-5.289E-02	.159	-.079	-.332	.741	-.374	.268	.259	-.050	-.034
	CAUSE_9	5.862E-02	.142	.082	.413	.682	-.228	.345	.315	.062	.043
	CAUSE_11	.111	.122	.174	.912	.367	-.134	.357	.303	.136	.094
	CAUSE_12	-.190	.086	-.280	-2.217	.032	-.363	-.017	-.054	-.317	-.229

Analysis for Ca-SCP2-MC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.150	6.668
	CAUSE_3	.440	2.272
	CAUSE_4	.195	5.125
	CAUSE_5	.299	3.343
	CAUSE_6	.783	1.277
	CAUSE_7	.394	2.541
	CAUSE_8	.187	5.351
	CAUSE_9	.257	3.897
	CAUSE_10	.337	2.964
	CAUSE_11	.250	3.995
	CAUSE_12	.568	1.761
2	(Constant)		
	CAUSE_1	.214	4.674
	CAUSE_2	.151	6.626
	CAUSE_3	.440	2.270
	CAUSE_4	.197	5.074
	CAUSE_5	.300	3.335
	CAUSE_6	.784	1.275
	CAUSE_7	.394	2.541
	CAUSE_8	.188	5.321
	CAUSE_9	.269	3.711
	CAUSE_11	.279	3.590
	CAUSE_12	.663	1.509
3	(Constant)		
	CAUSE_1	.227	4.398
	CAUSE_2	.151	6.620
	CAUSE_4	.197	5.068
	CAUSE_5	.344	2.911
	CAUSE_6	.787	1.270
	CAUSE_7	.398	2.513
	CAUSE_8	.191	5.247
	CAUSE_9	.271	3.694
	CAUSE_11	.294	3.399
	CAUSE_12	.668	1.497

Analysis for Ca-SCP2-MC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	2.966	.556		5.336	.000	1.846	4.086			
	CAUSE_1	.394	.146	.576	2.693	.010	.099	.689	.508	.373	.275
	CAUSE_2	-.313	.183	-.447	-1.712	.094	-.682	.055	.489	-.247	-.175
	CAUSE_4	.163	.141	.257	1.156	.254	-.121	.448	.573	.170	.118
	CAUSE_5	.257	.115	.382	2.229	.031	.025	.489	.585	.315	.228
	CAUSE_6	-4.105E-02	.019	-.243	-2.124	.039	-.080	-.002	-.028	-.302	-.217
	CAUSE_8	-3.046E-02	.138	-.045	-.220	.827	-.309	.248	.259	-.033	-.022
	CAUSE_9	5.396E-02	.140	.075	.386	.701	-.228	.335	.315	.057	.039
	CAUSE_11	.110	.121	.172	.916	.364	-.132	.353	.303	.135	.094
	CAUSE_12	-.194	.084	-.285	-2.311	.025	-.363	-.025	-.054	-.326	-.236
5	(Constant)	2.951	.546		5.405	.000	1.852	4.050			
	CAUSE_1	.395	.145	.577	2.727	.009	.103	.687	.508	.373	.276
	CAUSE_2	-.320	.179	-.457	-1.793	.080	-.679	.039	.489	-.256	-.181
	CAUSE_4	.168	.138	.265	1.222	.228	-.109	.446	.573	.177	.124
	CAUSE_5	.255	.114	.379	2.242	.030	.026	.484	.585	.314	.227
	CAUSE_6	-4.223E-02	.018	-.250	-2.298	.026	-.079	-.005	-.028	-.321	-.232
	CAUSE_9	4.251E-02	.128	.059	.331	.742	-.216	.301	.315	.049	.033
	CAUSE_11	9.725E-02	.103	.152	.940	.352	-.111	.306	.303	.137	.095
	CAUSE_12	-.196	.083	-.289	-2.376	.022	-.362	-.030	-.054	-.331	-.240
6	(Constant)	2.955	.541		5.466	.000	1.868	4.043			
	CAUSE_1	.390	.143	.569	2.733	.009	.103	.676	.508	.370	.274
	CAUSE_2	-.311	.175	-.445	-1.781	.081	-.663	.040	.489	-.251	-.178
	CAUSE_4	.182	.131	.285	1.388	.172	-.082	.445	.573	.198	.139
	CAUSE_5	.248	.111	.370	2.239	.030	.025	.472	.585	.310	.224
	CAUSE_6	-4.163E-02	.018	-.246	-2.298	.026	-.078	-.005	-.028	-.318	-.230
	CAUSE_11	.119	.080	.185	1.485	.144	-.042	.280	.303	.212	.149
	CAUSE_12	-.189	.079	-.279	-2.390	.021	-.349	-.030	-.054	-.329	-.239
7	(Constant)	3.004	.545		5.515	.000	1.909	4.099			
	CAUSE_1	.364	.143	.532	2.552	.014	.077	.651	.508	.346	.258
	CAUSE_2	-.203	.158	-.290	-1.285	.205	-.521	.115	.489	-.182	-.130
	CAUSE_5	.345	.088	.513	3.937	.000	.169	.521	.585	.494	.398
	CAUSE_6	-3.724E-02	.018	-.220	-2.068	.044	-.073	-.001	-.028	-.286	-.209
	CAUSE_11	.126	.081	.197	1.563	.125	-.036	.288	.303	.220	.158
	CAUSE_12	-.198	.080	-.292	-2.489	.016	-.359	-.038	-.054	-.338	-.252

Analysis for Ca-SCP2-MC

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP2	4.402	1.4252	117
CAUSE_1	6.329	1.6945	117
CAUSE_2	5.368	1.7731	117
CAUSE_3	5.581	1.7665	117
CAUSE_4	5.350	1.6417	117
CAUSE_5	5.261	1.6976	117
CAUSE_6	5.171	1.7034	117
CAUSE_7	5.500	1.7145	117
CAUSE_8	6.444	1.6697	117
CAUSE_9	7.162	1.6646	117
CAUSE_10	5.615	1.5134	117
CAUSE_11	5.551	1.6287	117
CAUSE_12	5.765	1.7039	117

Correlations

		SCP2	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP2	1.000	.252	.300	.364	.384	.387	.327	.308	.345	.364
	CAUSE_1	.252	1.000	.662	.486	.432	.520	.496	.329	.453	.384
	CAUSE_2	.300	.662	1.000	.607	.561	.516	.445	.355	.402	.390
	CAUSE_3	.364	.486	.607	1.000	.624	.565	.566	.500	.319	.473
	CAUSE_4	.384	.432	.561	.624	1.000	.644	.472	.420	.395	.386
	CAUSE_5	.387	.520	.516	.565	.644	1.000	.654	.405	.446	.376
	CAUSE_6	.327	.496	.445	.566	.472	.654	1.000	.481	.417	.464
	CAUSE_7	.308	.329	.355	.500	.420	.405	.481	1.000	.416	.331
	CAUSE_8	.345	.453	.402	.319	.395	.446	.417	.416	1.000	.478
	CAUSE_9	.364	.384	.390	.473	.386	.376	.464	.331	.478	1.000
	CAUSE_10	.385	.331	.265	.394	.487	.492	.348	.229	.339	.502
	CAUSE_11	.353	.288	.386	.406	.495	.429	.356	.418	.483	.537
	CAUSE_12	.181	.199	.112	.218	.237	.238	.278	.292	.350	.289
Sig. (1-tailed)	SCP2	.	.003	.001	.000	.000	.000	.000	.000	.000	.000
	CAUSE_1	.003	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_2	.001	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE_4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE_5	.000	.000	.000	.000	.000	.	.000	.000	.000	.000
	CAUSE_6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE_7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE_8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE_9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.
	CAUSE_10	.000	.000	.002	.000	.000	.000	.000	.006	.000	.000
	CAUSE_11	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_12	.025	.016	.114	.009	.005	.005	.001	.001	.000	.001
N	SCP2	117	117	117	117	117	117	117	117	117	117
	CAUSE_1	117	117	117	117	117	117	117	117	117	117
	CAUSE_2	117	117	117	117	117	117	117	117	117	117
	CAUSE_3	117	117	117	117	117	117	117	117	117	117
	CAUSE_4	117	117	117	117	117	117	117	117	117	117
	CAUSE_5	117	117	117	117	117	117	117	117	117	117
	CAUSE_6	117	117	117	117	117	117	117	117	117	117
	CAUSE_7	117	117	117	117	117	117	117	117	117	117
	CAUSE_8	117	117	117	117	117	117	117	117	117	117
	CAUSE_9	117	117	117	117	117	117	117	117	117	117

Analysis for Ca-SCP2-SC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.228	4.387
	CAUSE_2	.153	6.550
	CAUSE_4	.212	4.725
	CAUSE_5	.354	2.822
	CAUSE_6	.799	1.251
	CAUSE_8	.247	4.046
	CAUSE_9	.274	3.648
	CAUSE_11	.294	3.397
	CAUSE_12	.683	1.463
5	(Constant)		
	CAUSE_1	.228	4.385
	CAUSE_2	.157	6.364
	CAUSE_4	.218	4.594
	CAUSE_5	.357	2.804
	CAUSE_6	.866	1.155
	CAUSE_9	.318	3.143
	CAUSE_11	.392	2.554
	CAUSE_12	.692	1.445
6	(Constant)		
	CAUSE_1	.231	4.326
	CAUSE_2	.161	6.228
	CAUSE_4	.237	4.215
	CAUSE_5	.368	2.720
	CAUSE_6	.874	1.144
	CAUSE_11	.643	1.554
	CAUSE_12	.737	1.358
7	(Constant)		
	CAUSE_1	.235	4.255
	CAUSE_2	.201	4.985
	CAUSE_5	.602	1.660
	CAUSE_6	.902	1.109
	CAUSE_11	.646	1.547
	CAUSE_12	.742	1.348

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_1	.662	1.511
	CAUSE_5	.654	1.530
	CAUSE_6	.903	1.101
	CAUSE_11	.760	1.315
	CAUSE_12	.842	1.187
9	(Constant)		
	CAUSE_1	.678	1.475
	CAUSE_5	.683	1.465
	CAUSE_6	.916	1.092
	CAUSE_12	.935	1.069

a. Dependent Variable: SCP2

Analysis for Ca-SCP2-MC

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP2

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.511[a]	.262	.176	1.2934	.262	3.070	12	104	.001
2	.511[b]	.262	.184	1.2873	.000	.011	1	106	.915
3	.511[c]	.261	.191	1.2816	.000	.061	1	107	.806
4	.510[d]	.260	.198	1.2761	-.001	.092	1	108	.763
5	.509[e]	.259	.204	1.2712	-.001	.171	1	109	.680
6	.507[f]	.257	.209	1.2673	-.002	.319	1	110	.573
7	.505[g]	.255	.214	1.2634	-.002	.337	1	111	.563
8	.499[h]	.249	.215	1.2626	-.006	.859	1	112	.356
9	.490[i]	.240	.213	1.2642	-.009	1.280	1	113	.260
10	.478[j]	.229	.208	1.2683	-.012	1.704	1	114	.194

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

e. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

f. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_3, CAUSE_5

g. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_5

h. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4

i. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_4

j. Predictors: (Constant), CAUSE_10, CAUSE_8, CAUSE_4

k. Dependent Variable: SCP2

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	61.637	12	5.136	3.070	.001[a]
	Residual	173.983	104	1.673		
	Total	235.620	116			
2	Regression	61.618	11	5.602	3.380	.000[b]
	Residual	174.002	105	1.657		
	Total	235.620	116			
3	Regression	61.517	10	6.152	3.745	.000[c]
	Residual	174.102	106	1.642		
	Total	235.620	116			

Analysis for Ca-SCP2-SC

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP2	.385	.353	.181
	CAUSE_1	.331	.288	.199
	CAUSE_2	.265	.386	.112
	CAUSE_3	.394	.406	.218
	CAUSE_4	.487	.495	.237
	CAUSE_5	.492	.429	.238
	CAUSE_6	.348	.356	.278
	CAUSE_7	.229	.418	.292
	CAUSE_8	.339	.483	.350
	CAUSE_9	.502	.537	.289
	CAUSE_10	1.000	.506	.349
	CAUSE_11	.506	1.000	.392
	CAUSE_12	.349	.392	1.000
Sig. (1-tailed)	SCP2	.000	.000	.025
	CAUSE_1	.000	.001	.016
	CAUSE_2	.002	.000	.114
	CAUSE_3	.000	.000	.009
	CAUSE_4	.000	.000	.005
	CAUSE_5	.000	.000	.005
	CAUSE_6	.000	.000	.001
	CAUSE_7	.006	.000	.001
	CAUSE_8	.000	.000	.000
	CAUSE_9	.000	.000	.001
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.000
	CAUSE_12	.000	.000	.
N	SCP2	117	117	117
	CAUSE_1	117	117	117
	CAUSE_2	117	117	117
	CAUSE_3	117	117	117
	CAUSE_4	117	117	117
	CAUSE_5	117	117	117
	CAUSE_6	117	117	117
	CAUSE_7	117	117	117
	CAUSE_8	117	117	117
	CAUSE_9	117	117	117
	CAUSE_10	117	117	117
	CAUSE_11	117	117	117
	CAUSE_12	117	117	117

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5[a]	.	Enter
2	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP2-SC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	.907	.644		1.407	.162	-.371	2.184			
	CAUSE_1	-6.928E-02	.100	-.082	-.691	.491	-.268	.129	.252	-.067	-.057
	CAUSE_2	4.298E-02	.104	.053	.414	.680	-.163	.249	.300	.040	.034
	CAUSE_3	5.631E-02	.104	.070	.543	.588	-.149	.262	.364	.052	.045
	CAUSE_4	6.232E-02	.110	.072	.567	.572	-.156	.280	.384	.055	.047
	CAUSE_5	8.876E-02	.103	.106	.859	.392	-.116	.294	.387	.083	.071
	CAUSE_7	7.004E-02	.085	.084	.826	.411	-.098	.238	.308	.080	.069
	CAUSE_8	.104	.092	.121	1.132	.260	-.078	.285	.345	.109	.094
	CAUSE_9	8.722E-02	.094	.102	.929	.355	-.099	.273	.364	.089	.077
	CAUSE_10	.162	.102	.172	1.591	.114	-.040	.364	.385	.152	.132
5	(Constant)	.902	.642		1.405	.163	-.370	2.174			
	CAUSE_1	-4.996E-02	.088	-.059	-.565	.573	-.225	.125	.252	-.054	[illegible]
	CAUSE_3	6.782E-02	.099	.084	.682	.497	-.129	.265	.364	.065	[illegible]
	CAUSE_4	7.305E-02	.106	.084	.686	.494	-.138	.284	.384	.066	[illegible]
	CAUSE_5	9.044E-02	.103	.108	.879	.381	-.113	.294	.387	.084	[illegible]
	CAUSE_7	6.832E-02	.084	.082	.810	.420	-.099	.236	.308	.078	[illegible]
	CAUSE_8	.106	.091	.124	1.165	.247	-.074	.287	.345	.111	[illegible]
	CAUSE_9	8.995E-02	.093	.105	.965	.337	-.095	.275	.364	.092	[illegible]
	CAUSE_10	.154	.100	.164	1.548	.125	-.043	.352	.385	.147	[illegible]
6	(Constant)	.815	.621		1.312	.192	-.416	2.046			
	CAUSE_3	5.632E-02	.097	.070	.580	.563	-.136	.249	.364	.056	[illegible]
	CAUSE_4	7.272E-02	.106	.084	.685	.495	-.138	.283	.384	.065	[illegible]
	CAUSE_5	7.753E-02	.100	.092	.775	.440	-.121	.276	.387	.074	.064
	CAUSE_7	6.921E-02	.084	.083	.823	.412	-.097	.236	.305	.079	.068
	CAUSE_8	9.417E-02	.088	.110	1.066	.289	-.081	.269	.345	.102	.088
	CAUSE_9	8.666E-02	.093	.101	.934	.352	-.097	.271	.364	.089	.077
	CAUSE_10	.154	.099	.164	1.554	.123	-.043	.352	.385	.147	.128
7	(Constant)	.822	.619		1.328	.187	-.405	2.049			
	CAUSE_4	9.370E-02	.099	.108	.942	.348	-.103	.291	.384	.089	.078
	CAUSE_5	9.020E-02	.097	.107	.927	.356	-.103	.283	.397	.088	.076
	CAUSE_7	8.326E-02	.080	.100	1.037	.302	-.076	.242	.308	.098	.085
	CAUSE_8	8.662E-02	.087	.101	.995	.322	-.086	.259	.345	.094	.082
	CAUSE_9	.101	.089	.118	1.140	.257	-.075	.278	.364	.109	.094
	CAUSE_10	.153	.099	.163	1.547	.125	-.043	.350	.385	.146	.127

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	61.367	9	6.819	4.187	.000[d]
	Residual	174.253	107	1.629		
	Total	235.620	116			
5	Regression	61.088	8	7.636	4.725	.000[e]
	Residual	174.532	108	1.616		
	Total	235.620	116			
6	Regression	60.571	7	8.653	5.388	.000[f]
	Residual	175.048	109	1.606		
	Total	235.620	116			
7	Regression	60.030	6	10.005	6.268	.000[g]
	Residual	175.589	110	1.596		
	Total	235.620	116			
8	Regression	58.658	5	11.732	7.359	.000[h]
	Residual	176.961	111	1.594		
	Total	235.620	116			
9	Regression	56.617	4	14.154	8.856	.000[i]
	Residual	179.002	112	1.598		
	Total	235.620	116			
10	Regression	53.894	3	17.965	11.171	.000[j]
	Residual	181.726	113	1.608		
	Total	235.620	116			

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

e. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

f. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_3, CAUSE_5

g. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_5

h. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4

i. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_4

j. Predictors: (Constant), CAUSE_10, CAUSE_8, CAUSE_4

k. Dependent Variable: SCP2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	.818	.619		1.323	.189	-.407	2.044			
	CAUSE_4	.135	.089	.155	1.509	.134	-.042	.311	.384	.142	.124
	CAUSE_7	9.304E-02	.080	.112	1.170	.245	-.065	.251	.308	.110	.096
	CAUSE_8	.102	.086	.119	1.188	.237	-.068	.271	.345	.112	.098
	CAUSE_9	.101	.089	.117	1.131	.260	-.076	.277	.364	.107	.093
	CAUSE_10	.174	.097	.185	1.802	.074	-.017	.365	.385	.169	.148
9	(Constant)	1.045	.586		1.782	.077	-.117	2.206			
	CAUSE_4	.140	.089	.161	1.572	.119	-.036	.317	.384	.147	.130
	CAUSE_7	.103	.079	.124	1.305	.194	-.053	.260	.308	.122	.108
	CAUSE_8	.131	.082	.153	1.606	.111	-.031	.293	.345	.150	.132
	CAUSE_10	.213	.090	.226	2.356	.020	.034	.392	.385	.217	.194
10	(Constant)	1.242	.568		2.187	.031	.117	2.368			
	CAUSE_4	.174	.086	.200	2.034	.044	.005	.343	.384	.188	[illegible]
	CAUSE_8	.163	.078	.191	2.087	.039	.008	.318	.345	.193	[illegible]
	CAUSE_10	.210	.091	.223	2.316	.022	.030	.389	.385	.213	[illegible]

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	.964	.674		1.431	.155	-.372	2.301			
	CAUSE_1	-6.536E-02	.104	-.078	-.629	.531	-.272	.141	.252	-.062	-.053
	CAUSE_2	3.603E-02	.107	.045	.336	.738	-.177	.249	.300	.033	.028
	CAUSE_3	5.661E-02	.107	.070	.530	.597	-.155	.268	.364	.052	.045
	CAUSE_4	5.934E-02	.113	.068	.526	.600	-.164	.283	.384	.052	.044
	CAUSE_5	8.246E-02	.115	.098	.715	.476	-.146	.311	.387	.070	.060
	CAUSE_6	1.132E-02	.106	.014	.107	.915	-.198	.221	.327	.010	.009
	CAUSE_7	6.856E-02	.090	.082	.765	.446	-.109	.246	.308	.075	.064
	CAUSE_8	.105	.096	.123	1.097	.275	-.085	.295	.345	.107	.092
	CAUSE_9	8.018E-02	.100	.094	.798	.426	-.119	.279	.364	.078	.067
	CAUSE_10	.164	.108	.174	1.514	.133	-.051	.378	.385	.147	[illegible]
	CAUSE_11	2.629E-02	.104	.030	.253	.801	-.180	.233	.353	.025	[illegible]
	CAUSE_12	-2.817E-02	.081	-.034	-.347	.729	-.189	.133	.181	-.034	[illegible]
2	(Constant)	.960	.670		1.434	.155	-.368	2.289			
	CAUSE_1	-6.392E-02	.103	-.076	-.623	.535	-.267	.140	.252	-.061	[illegible]
	CAUSE_2	3.545E-02	.107	.044	.333	.740	-.176	.247	.300	.032	[illegible]
	CAUSE_3	5.853E-02	.105	.073	.559	.577	-.149	.266	.364	.054	[illegible]
	CAUSE_4	5.877E-02	.112	.068	.524	.601	-.164	.281	.384	.051	[illegible]
	CAUSE_5	8.762E-02	.104	.104	.840	.403	-.119	.294	.387	.082	[illegible]
	CAUSE_7	7.039E-02	.088	.085	.803	.424	-.103	.244	.308	.078	[illegible]
	CAUSE_8	.105	.095	.123	1.104	.272	-.084	.294	.345	.107	[illegible]
	CAUSE_9	8.246E-02	.098	.096	.844	.400	-.111	.276	.364	.082	[illegible]
	CAUSE_10	.163	.107	.173	1.517	.132	-.050	.375	.385	.146	.127
	CAUSE_11	2.544E-02	.103	.029	.246	.806	-.179	.230	.353	.024	.021
	CAUSE_12	-2.739E-02	.080	-.033	-.340	.734	-.187	.132	.181	-.033	-.029
3	(Constant)	.955	.666		1.433	.155	-.366	2.276			
	CAUSE_1	-6.809E-02	.101	-.081	-.676	.501	-.268	.132	.252	-.065	-.056
	CAUSE_2	3.932E-02	.105	.049	.375	.709	-.169	.247	.300	.036	.031
	CAUSE_3	5.703E-02	.104	.071	.548	.585	-.149	.263	.364	.053	.046
	CAUSE_4	6.281E-02	.110	.072	.569	.571	-.156	.282	.384	.055	.047
	CAUSE_5	8.801E-02	.104	.105	.848	.399	-.118	.294	.387	.082	.071
	CAUSE_7	7.386E-02	.086	.089	.858	.393	-.097	.245	.308	.083	.072
	CAUSE_8	.109	.094	.128	1.164	.247	-.077	.295	.345	.112	.097
	CAUSE_9	8.833E-02	.094	.103	.937	.351	-.099	.275	.364	.091	.078
	CAUSE_10	.168	.104	.179	1.613	.110	-.039	.375	.385	.155	[illegible]
	CAUSE_12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Analysis for Ca-SCP2-SC

Model		Tolerance	VIF
8	(Constant)		
	CAUSE_4	.642	1.558
	CAUSE_7	.739	1.353
	CAUSE_8	.674	1.484
	CAUSE_9	.628	1.593
	CAUSE_10	.644	1.553
9	(Constant)		
	CAUSE_4	.644	1.553
	CAUSE_7	.749	1.336
	CAUSE_8	.743	1.346
	CAUSE_10	.737	1.356
10	(Constant)		
	CAUSE_4	.703	1.422
	CAUSE_8	.816	1.225
	CAUSE_10	.738	1.356

a. Dependent Variable: SCP2

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP2	5.340	1.5594	25
CAUSE_1	6.800	2.2913	25
CAUSE_2	6.680	2.1884	25
CAUSE_3	6.600	2.2913	25
CAUSE_4	6.820	2.3313	25
CAUSE_5	6.700	2.2638	25
CAUSE_6	6.200	2.2958	25
CAUSE_7	5.680	2.0355	25
CAUSE_8	6.400	1.8428	25
CAUSE_9	5.520	2.3826	25
CAUSE_10	6.440	2.0530	25
CAUSE_11	5.320	2.5612	25
CAUSE_12	5.600	2.3629	25

Model		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.465	2.152
	CAUSE_2	.399	2.507
	CAUSE_3	.406	2.466
	CAUSE_4	.421	2.378
	CAUSE_5	.376	2.657
	CAUSE_6	.444	2.250
	CAUSE_7	.610	1.639
	CAUSE_8	.564	1.774
	CAUSE_9	.516	1.938
	CAUSE_10	.538	1.859
	CAUSE_11	.502	1.991
	CAUSE_12	.754	1.326
2	(Constant)		
	CAUSE_1	.473	2.116
	CAUSE_2	.400	2.501
	CAUSE_3	.417	2.396
	CAUSE_4	.422	2.372
	CAUSE_5	.456	2.195
	CAUSE_7	.633	1.580
	CAUSE_8	.564	1.773
	CAUSE_9	.540	1.851
	CAUSE_10	.542	1.845
	CAUSE_11	.505	1.979
	CAUSE_12	.760	1.315
3	(Constant)		
	CAUSE_1	.486	2.059
	CAUSE_2	.409	2.447
	CAUSE_3	.419	2.388
	CAUSE_4	.431	2.322
	CAUSE_5	.456	2.194
	CAUSE_7	.650	1.539
	CAUSE_8	.579	1.728
	CAUSE_9	.574	1.741
	CAUSE_10	.568	1.762
	CAUSE_12	.785	1.274

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.486	2.056
	CAUSE_2	.414	2.414
	CAUSE_3	.419	2.387
	CAUSE_4	.431	2.321
	CAUSE_5	.456	2.193
	CAUSE_7	.664	1.506
	CAUSE_8	.600	1.667
	CAUSE_9	.575	1.738
	CAUSE_10	.591	1.692
5	(Constant)		
	CAUSE_1	.621	1.610
	CAUSE_3	.452	2.215
	CAUSE_4	.456	2.192
	CAUSE_5	.457	2.190
	CAUSE_7	.666	1.502
	CAUSE_8	.602	1.660
	CAUSE_9	.578	1.729
	CAUSE_10	.611	1.636
6	(Constant)		
	CAUSE_3	.471	2.122
	CAUSE_4	.456	2.192
	CAUSE_5	.480	2.082
	CAUSE_7	.666	1.502
	CAUSE_8	.637	1.571
	CAUSE_9	.580	1.723
	CAUSE_10	.611	1.636
7	(Constant)		
	CAUSE_4	.516	1.938
	CAUSE_5	.504	1.982
	CAUSE_7	.726	1.377
	CAUSE_8	.651	1.537
	CAUSE_9	.628	1.593
	CAUSE_10	.612	1.635

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4[a]	.	Enter
2	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP2

Correlations

		SCP2	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP2	1.000	.679	.708	.489	.559	.434	.463	.462	.755	.635
	CAUSE_1	.679	1.000	.942	.571	.835	.651	.440	.316	.405	.386
	CAUSE_2	.708	.942	1.000	.597	.829	.621	.442	.294	.452	.385
	CAUSE_3	.489	.571	.597	1.000	.746	.442	.202	.472	.528	.498
	CAUSE_4	.559	.835	.829	.746	1.000	.747	.281	.251	.388	.389
	CAUSE_5	.434	.651	.621	.442	.747	1.000	.423	-.080	.210	.088
	CAUSE_6	.463	.440	.442	.202	.281	.423	1.000	.277	.510	.155
	CAUSE_7	.462	.316	.294	.472	.251	-.080	.277	1.000	.530	.611
	CAUSE_8	.755	.405	.452	.528	.388	.210	.510	.530	1.000	.748
	CAUSE_9	.635	.386	.385	.498	.389	.088	.155	.611	.748	1.000
	CAUSE_10	.573	.617	.624	.500	.631	.424	.414	.404	.665	.718
	CAUSE_11	.525	.452	.413	.555	.530	.165	.315	.508	.669	.736
	CAUSE_12	.417	.323	.325	.316	.221	-.090	.396	.466	.522	.401
Sig. (1-tailed)	SCP2	.	.000	.000	.007	.002	.015	.010	.010	.000	.000
	CAUSE_1	.000	.	.000	.001	.000	.000	.014	.062	.022	.028
	CAUSE_2	.000	.000	.	.001	.000	.000	.013	.077	.012	.029
	CAUSE_3	.007	.001	.001	.	.000	.014	.166	.009	.003	.006
	CAUSE_4	.002	.000	.000	.000	.	.000	.086	.113	.028	.027
	CAUSE_5	.015	.000	.000	.014	.000	.	.018	.351	.157	.338
	CAUSE_6	.010	.014	.013	.166	.086	.018	.	.090	.005	.229
	CAUSE_7	.010	.062	.077	.009	.113	.351	.090	.	.003	.001
	CAUSE_8	.000	.022	.012	.003	.028	.157	.005	.003	.	.000
	CAUSE_9	.000	.028	.029	.006	.027	.338	.229	.001	.000	.
	CAUSE_10	.001	.001	.000	.006	.000	.017	.020	.023	.000	.000
	CAUSE_11	.004	.012	.020	.002	.003	.216	.063	.005	.000	.000
	CAUSE_12	.019	.058	.057	.062	.144	.335	.025	.009	.004	.023
N	SCP2	25	25	25	25	25	25	25	25	25	25
	CAUSE_1	25	25	25	25	25	25	25	25	25	25
	CAUSE_2	25	25	25	25	25	25	25	25	25	25
	CAUSE_3	25	25	25	25	25	25	25	25	25	25
	CAUSE_4	25	25	25	25	25	25	25	25	25	25
	CAUSE_5	25	25	25	25	25	25	25	25	25	25
	CAUSE_6	25	25	25	25	25	25	25	25	25	25
	CAUSE_7	25	25	25	25	25	25	25	25	25	25
	CAUSE_8	25	25	25	25	25	25	25	25	25	25
	CAUSE_9	25	25	25	25	25	25	25	25	25	25
	CAUSE_10	25	25	25	25	25	25	25	25	25	25
	CAUSE_11	25	25	25	25	25	25	25	25	25	25
	CAUSE_12	25	25	25	25	25	25	25	25	25	25

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP2	.573	.525	.417
	CAUSE_1	.617	.452	.323
	CAUSE_2	.624	.413	.325
	CAUSE_3	.500	.555	.316
	CAUSE_4	.631	.530	.221
	CAUSE_5	.424	.165	-.090
	CAUSE_6	.414	.315	.396
	CAUSE_7	.404	.508	.466
	CAUSE_8	.665	.669	.522
	CAUSE_9	.718	.736	.401
	CAUSE_10	1.000	.737	.394
	CAUSE_11	.737	1.000	.731
	CAUSE_12	.394	.731	1.000
Sig. (1-tailed)	SCP2	.001	.004	.019
	CAUSE_1	.001	.012	.058
	CAUSE_2	.000	.020	.057
	CAUSE_3	.006	.002	.062
	CAUSE_4	.000	.003	.144
	CAUSE_5	.017	.216	.335
	CAUSE_6	.020	.063	.025
	CAUSE_7	.023	.005	.009
	CAUSE_8	.000	.000	.004
	CAUSE_9	.000	.000	.023
	CAUSE_10	.	.000	.026
	CAUSE_11	.000	.	.000
	CAUSE_12	.026	.000	.
N	SCP2	25	25	25
	CAUSE_1	25	25	25
	CAUSE_2	25	25	25
	CAUSE_3	25	25	25
	CAUSE_4	25	25	25
	CAUSE_5	25	25	25
	CAUSE_6	25	25	25
	CAUSE_7	25	25	25
	CAUSE_8	25	25	25
	CAUSE_9	25	25	25
	CAUSE_10	25	25	25

Model		B	Std. Error	Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	5.300E-02	1.003		.053	.959	-2.132	2.238			
	CAUSE_1	6.641E-02	.284	.098	.234	.819	-.552	.685	.679	.067	.028
	CAUSE_2	.412	.329	.578	1.250	.235	-.306	1.130	.708	.339	.151
	CAUSE_3	-.163	.155	-.239	-1.050	.314	-.500	.175	.489	-.290	-.127
	CAUSE_4	-.146	.294	-.219	-.497	.628	-.787	.494	.559	-.142	-.060
	CAUSE_5	.237	.187	.343	1.263	.231	-.172	.645	.434	.342	.153
	CAUSE_6	-7.982E-02	.144	-.118	-.555	.589	-.393	.234	.463	-.158	-.067
	CAUSE_7	9.707E-02	.148	.127	.655	.525	-.226	.420	.462	.186	.079
	CAUSE_8	.492	.213	.581	2.305	.040	.027	.956	.755	.554	.279
	CAUSE_9	.158	.199	.242	.795	.442	-.276	.592	.635	.224	.096
	CAUSE_10	-.300	.196	-.395	-1.527	.153	-.728	.128	.573	-.403	-.185
	CAUSE_11	7.897E-02	.243	.130	.325	.751	-.450	.608	.525	.093	.039
	CAUSE_12	3.593E-04	.175	.001	.002	.998	-.382	.382	.417	.001	.000
2	(Constant)	5.388E-02	.871		.062	.952	-1.827	1.935			
	CAUSE_1	6.641E-02	.273	.098	.243	.811	-.523	.656	.679	.067	.02[illegible]
	CAUSE_2	.412	.297	.578	1.389	.188	-.229	1.053	.708	.360	.16[illegible]
	CAUSE_3	-.163	.149	-.239	-1.093	.294	-.484	.159	.489	-.290	-.12[illegible]
	CAUSE_4	-.146	.268	-.219	-.547	.594	-.725	.432	.559	-.150	-.06[illegible]
	CAUSE_5	.236	.178	.343	1.325	.208	-.149	.622	.434	.345	.15[illegible]
	CAUSE_6	-7.980E-02	.138	-.117	-.578	.573	-.378	.218	.463	-.158	-.06[illegible]
	CAUSE_7	9.713E-02	.140	.127	.693	.501	-.206	.400	.462	.189	.08[illegible]
	CAUSE_8	.492	.202	.581	2.430	.030	.055	.929	.755	.559	.28[illegible]
	CAUSE_9	.158	.176	.242	.899	.385	-.222	.538	.635	.242	.10[illegible]
	CAUSE_10	-.300	.181	-.395	-1.658	.121	-.691	.091	.573	-.418	-.19[illegible]
	CAUSE_11	7.935E-02	.151	.130	.527	.607	-.246	.405	.525	.145	.061
3	(Constant)	4.955E-02	.841		.059	.954	-1.754	1.853			
	CAUSE_2	.469	.175	.659	2.675	.018	.093	.845	.708	.582	.300
	CAUSE_3	-.169	.141	-.248	-1.198	.251	-.472	.134	.489	-.305	-.134
	CAUSE_4	-.141	.258	-.210	-.546	.594	-.693	.412	.559	-.144	-.061
	CAUSE_5	.246	.168	.357	1.462	.166	-.115	.607	.434	.364	.164
	CAUSE_6	-7.808E-02	.133	-.115	-.587	.567	-.364	.207	.463	-.155	-.066
	CAUSE_7	.104	.132	.136	.790	.443	-.179	.388	.462	.206	.089
	CAUSE_8	.481	.191	.568	2.522	.024	.072	.890	.755	.559	.283
	CAUSE_9	.161	.169	.247	.953	.357	-.202	.525	.635	.247	.107
	CAUSE_10	-.304	.174	-.401	-1.751	.102	-.677	.068	.573	-.424	-.197
	CAUSE_11	8.723E-02	.142	.143	.614	.549	-.217	.392	.525	.162	.069

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
4	(Constant)	8.956E-02	.818		.110	.914	-1.653	1.832			
	CAUSE_2	.405	.126	.568	3.201	.006	.135	.674	.708	.637	.351
	CAUSE_3	-.202	.124	-.297	-1.624	.125	-.467	.063	.489	-.387	-.178
	CAUSE_5	.185	.122	.268	1.512	.151	-.076	.445	.434	.364	.166
	CAUSE_6	-4.847E-02	.119	-.071	-.408	.689	-.301	.204	.463	-.105	-.045
	CAUSE_7	9.563E-02	.128	.125	.746	.467	-.178	.369	.462	.189	.082
	CAUSE_8	.495	.184	.585	2.686	.017	.102	.888	.755	.570	.294
	CAUSE_9	.180	.162	.275	1.109	.285	-.166	.525	.635	.275	.122
	CAUSE_10	-.314	.169	-.413	-1.858	.083	-.674	.046	.573	-.432	-.204
	CAUSE_11	4.882E-02	.120	.080	.406	.691	-.208	.305	.525	.104	.044
5	(Constant)	4.323E-02	.788		.055	.957	-1.628	1.714			
	CAUSE_2	.398	.122	.558	3.262	.005	.139	.656	.708	.632	.348
	CAUSE_3	-.185	.114	-.272	-1.623	.124	-.426	.057	.489	-.376	-.173
	CAUSE_5	.174	.116	.252	1.498	.153	-.072	.420	.434	.351	.1[illegible]
	CAUSE_6	-3.982E-02	.114	-.059	-.350	.731	-.281	.201	.463	-.087	-.0[illegible]
	CAUSE_7	9.308E-02	.125	.121	.747	.466	-.171	.357	.462	.184	.0[illegible]
	CAUSE_8	.495	.180	.585	2.757	.014	.114	.875	.755	.568	.29[illegible]
	CAUSE_9	.196	.153	.300	1.283	.218	-.128	.520	.635	.305	.1[illegible]
	CAUSE_10	-.285	.149	-.375	-1.908	.074	-.602	.032	.573	-.431	-.20[illegible]
6	(Constant)	7.834E-02	.761		.103	.919	-1.528	1.685			
	CAUSE_2	.392	.118	.551	3.331	.004	.144	.641	.708	.628	.34[illegible]
	CAUSE_3	-.170	.103	-.250	-1.649	.117	-.388	.048	.489	-.371	-.17[illegible]
	CAUSE_5	.160	.106	.232	1.508	.150	-.064	.383	.434	.343	.15[illegible]
	CAUSE_7	7.607E-02	.112	.099	.680	.505	-.160	.312	.462	.163	.07[illegible]
	CAUSE_8	.458	.142	.542	3.221	.005	.158	.759	.755	.616	.335
	CAUSE_9	.222	.130	.339	1.706	.106	-.053	.497	.635	.382	.177
	CAUSE_10	-.295	.143	-.388	-2.058	.055	-.597	.007	.573	-.447	-.214
7	(Constant)	.283	.689		.411	.686	-1.164	1.730			
	CAUSE_2	.404	.115	.567	3.519	.002	.163	.645	.708	.638	.360
	CAUSE_3	-.150	.097	-.220	-1.539	.141	-.354	.055	.489	-.341	-.158
	CAUSE_5	.135	.098	.196	1.379	.185	-.071	.342	.434	.309	.141
	CAUSE_8	.469	.139	.554	3.366	.003	.176	.762	.755	.621	.344
	CAUSE_9	.246	.124	.376	1.992	.062	-.013	.505	.635	.425	.204
	CAUSE_10	-.298	.141	-.393	-2.116	.049	-.594	-.002	.573	-.446	-.217

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.908[a]	.824	.649	.9240	.824	4.696	12	12	.006
2	.908[b]	.824	.676	.8878	.000	.000	1	14	.998
3	.908[c]	.824	.698	.8575	-.001	.059	1	15	.811
4	.905[d]	.820	.712	.8371	-.004	.298	1	16	.594
5	.904[e]	.818	.727	.8150	-.002	.165	1	17	.691
6	.904[f]	.817	.741	.7937	-.001	.123	1	18	.731
7	.901[g]	.812	.749	.7817	-.005	.463	1	19	.505
8	.890[h]	.792	.737	.8001	-.020	1.900	1	20	.185
9	.880[i]	.775	.730	.8101	-.017	1.506	1	21	.235
10	.868[j]	.754	.719	.8268	-.021	1.873	1	22	.186
11	.860[k]	.740	.716	.8311	-.014	1.232	1	23	.280

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
c. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_4
d. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11
e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8
f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8
g. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_3, CAUSE_2, CAUSE_10, CAUSE_8
h. Predictors: (Constant), CAUSE_9, CAUSE_3, CAUSE_2, CAUSE_10, CAUSE_8
i. Predictors: (Constant), CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8
j. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_8
k. Predictors: (Constant), CAUSE_2, CAUSE_8
l. Dependent Variable: SCP2

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48.114	12	4.009	4.696	.006[a]
	Residual	10.246	12	.854		
	Total	58.360	24			
2	Regression	48.114	11	4.374	5.549	.002[b]
	Residual	10.246	13	.788		
	Total	58.360	24			

Analysis for Ca-SCP2-CC

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	48.067	10	4.807	6.538	.001[c]
	Residual	10.293	14	.735		
	Total	58.360	24			
4	Regression	47.848	9	5.316	7.586	.000[d]
	Residual	10.512	15	.701		
	Total	58.360	24			
5	Regression	47.733	8	5.967	8.983	.000[e]
	Residual	10.627	16	.664		
	Total	58.360	24			
6	Regression	47.651	7	6.807	10.807	.000[f]
	Residual	10.709	17	.630		
	Total	58.360	24			
7	Regression	47.360	6	7.893	12.916	.000[g]
	Residual	11.000	18	.611		
	Total	58.360	24			
8	Regression	46.198	5	9.240	14.435	.000[h]
	Residual	12.162	19	.640		
	Total	58.360	24			
9	Regression	45.234	4	11.309	17.231	.000[i]
	Residual	13.126	20	.656		
	Total	58.360	24			
10	Regression	44.005	3	14.668	21.459	.000[j]
	Residual	14.355	21	.684		
	Total	58.360	24			
11	Regression	43.163	2	21.582	31.243	.000[k]
	Residual	15.197	22	.691		
	Total	58.360	24			

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
c. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_4
d. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11
e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8
f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8
g. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_3, CAUSE_2, CAUSE_10, CAUSE_8
h. Predictors: (Constant), CAUSE_9, CAUSE_3, CAUSE_2, CAUSE_10, CAUSE_8
i. Predictors: (Constant), CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8
j. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_8
k. Predictors: (Constant), CAUSE_2, CAUSE_8
l. Dependent Variable: SCP2

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_2	.381	2.621
	CAUSE_3	.359	2.785
	CAUSE_5	.382	2.617
	CAUSE_6	.393	2.542
	CAUSE_7	.429	2.331
	CAUSE_8	.253	3.954
	CAUSE_9	.196	5.108
	CAUSE_10	.243	4.116
	CAUSE_11	.307	3.255
5	(Constant)		
	CAUSE_2	.389	2.573
	CAUSE_3	.406	2.463
	CAUSE_5	.401	2.494
	CAUSE_6	.406	2.460
	CAUSE_7	.430	2.326
	CAUSE_8	.253	3.954
	CAUSE_9	.209	4.793
	CAUSE_10	.294	3.401
6	(Constant)		
	CAUSE_2	.395	2.533
	CAUSE_3	.468	2.135
	CAUSE_5	.457	2.190
	CAUSE_7	.507	1.973
	CAUSE_8	.382	2.620
	CAUSE_9	.273	3.667
	CAUSE_10	.304	3.291
7	(Constant)		
	CAUSE_2	.403	2.480
	CAUSE_3	.513	1.951
	CAUSE_5	.516	1.940
	CAUSE_8	.386	2.589
	CAUSE_9	.294	3.401
	CAUSE_10	.304	3.287

Analysis for Ca-SCP2-CC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	.564	.673		.837	.413	-.846	1.973			
	CAUSE_2	.465	.109	.652	4.277	.000	.237	.692	.708	.700	.448
	CAUSE_3	-.119	.097	-.175	-1.227	.235	-.322	.084	.489	-.271	-.129
	CAUSE_8	.465	.143	.550	3.262	.004	.167	.763	.755	.599	.342
	CAUSE_9	.189	.119	.289	1.587	.129	-.060	.438	.635	.342	.166
	CAUSE_10	-.242	.138	-.319	-1.755	.095	-.532	.047	.573	-.373	-.184
9	(Constant)	.431	.673		.640	.530	-.973	1.834			
	CAUSE_2	.405	.098	.568	4.116	.001	.200	.610	.708	.677	.437
	CAUSE_8	.435	.142	.514	3.057	.006	.138	.731	.755	.564	.324
	CAUSE_9	.162	.119	.248	1.368	.186	-.085	.410	.635	.293	.145
	CAUSE_10	-.229	.139	-.301	-1.640	.117	-.520	.062	.573	-.344	-.174
10	(Constant)	.247	.673		.367	.717	-1.153	1.647			
	CAUSE_2	.382	.099	.535	3.859	.001	.176	.587	.708	.644	.418
	CAUSE_8	.538	.123	.636	4.382	.000	.281	.794	.755	.691	.47[illegible]
	CAUSE_10	-.140	.126	-.184	-1.110	.280	-.401	.122	.573	-.235	-.12[illegible]
11	(Constant)	.183	.674		.271	.789	-1.215	1.581			
	CAUSE_2	.328	.087	.461	3.778	.001	.148	.508	.708	.627	.41[illegible]
	CAUSE_8	.463	.103	.547	4.490	.000	.249	.677	.755	.692	.48[illegible]

Analysis for Ca-SCP2-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.472	2.118
	CAUSE_3	.541	1.847
	CAUSE_8	.386	2.588
	CAUSE_9	.331	3.020
	CAUSE_10	.332	3.016
9	(Constant)		
	CAUSE_2	.590	1.695
	CAUSE_8	.398	2.510
	CAUSE_9	.343	2.919
	CAUSE_10	.334	2.997
10	(Constant)		
	CAUSE_2	.608	1.644
	CAUSE_8	.556	1.799
	CAUSE_10	.427	2.344
11	(Constant)		
	CAUSE_2	.796	1.256
	CAUSE_8	.796	1.256

a. Dependent Variable: SCP2

Analysis for Ca-SCP2-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.084	11.893
	CAUSE_2	.068	14.614
	CAUSE_3	.283	3.532
	CAUSE_4	.076	13.197
	CAUSE_5	.198	5.056
	CAUSE_6	.326	3.070
	CAUSE_7	.390	2.561
	CAUSE_8	.230	4.342
	CAUSE_9	.158	6.328
	CAUSE_10	.219	4.569
	CAUSE_11	.092	10.874
	CAUSE_12	.207	4.827
2	(Constant)		
	CAUSE_1	.084	11.892
	CAUSE_2	.078	12.833
	CAUSE_3	.283	3.531
	CAUSE_4	.084	11.868
	CAUSE_5	.201	4.968
	CAUSE_6	.327	3.057
	CAUSE_7	.403	2.481
	CAUSE_8	.236	4.233
	CAUSE_9	.187	5.351
	CAUSE_10	.238	4.199
	CAUSE_11	.221	4.525
3	(Constant)		
	CAUSE_2	.208	4.809
	CAUSE_3	.293	3.414
	CAUSE_4	.085	11.773
	CAUSE_5	.211	4.732
	CAUSE_6	.328	3.049
	CAUSE_7	.423	2.367
	CAUSE_8	.248	4.030
	CAUSE_9	.188	5.319
	CAUSE_10	.241	4.157

Analysis for Ca-SCP2-CC

SPSS regression printouts for SCP3 analysis

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP3	5.064	1.5021	196
CAUSE1	6.138	1.9458	196
CAUSE2	5.574	1.9848	196
CAUSE3	5.648	1.9971	196
CAUSE4	5.640	2.0209	196
CAUSE5	5.497	1.9933	196
CAUSE6	5.128	1.9372	196
CAUSE7	5.273	2.0276	196
CAUSE8	6.171	1.9229	196
CAUSE9	6.298	2.1130	196
CAUSE10	5.959	1.7712	196
CAUSE11	5.329	2.0103	196
CAUSE12	5.617	1.9517	196

Correlations

		SCP3	CAUSE1	CAUSE2	CAUSE3	CAUSE4	CAUSE5	CAUSE6	CAUSE7	CAUSE8	CAUSE9
Pearson Correlation	SCP3	1.000	.318	.406	.401	.410	.380	.259	.291	.322	.222
	CAUSE1	.318	1.000	.756	.568	.564	.548	.497	.399	.466	.414
	CAUSE2	.406	.756	1.000	.636	.706	.596	.462	.420	.440	.337
	CAUSE3	.401	.568	.636	1.000	.638	.580	.478	.472	.374	.367
	CAUSE4	.410	.564	.706	.638	1.000	.730	.462	.427	.384	.308
	CAUSE5	.380	.548	.596	.580	.730	1.000	.565	.316	.370	.226
	CAUSE6	.259	.497	.462	.478	.462	.565	1.000	.502	.443	.361
	CAUSE7	.291	.399	.420	.472	.427	.316	.502	1.000	.566	.472
	CAUSE8	.322	.466	.440	.374	.384	.370	.443	.566	1.000	.634
	CAUSE9	.222	.414	.337	.367	.308	.226	.361	.472	.634	1.000
	CAUSE10	.306	.308	.352	.335	.479	.433	.288	.276	.448	.412
	CAUSE11	.282	.361	.405	.353	.428	.320	.294	.488	.646	.638
	CAUSE12	.199	.247	.129	.203	.172	.158	.287	.262	.407	.350
Sig. (1-tailed)	SCP3	.	.000	.000	.000	.000	.000	.000	.000	.000	.001
	CAUSE1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE5	.000	.000	.000	.000	.000	.	.000	.000	.000	.001
	CAUSE6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE9	.001	.000	.000	.000	.000	.001	.000	.000	.000	.
	CAUSE10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE12	.003	.000	.036	.002	.008	.014	.000	.000	.000	.000
N	SCP3	196	196	196	196	196	196	196	196	196	196
	CAUSE1	196	196	196	196	196	196	196	196	196	196
	CAUSE2	196	196	196	196	196	196	196	196	196	196
	CAUSE3	196	196	196	196	196	196	196	196	196	196
	CAUSE4	196	196	196	196	196	196	196	196	196	196
	CAUSE5	196	196	196	196	196	196	196	196	196	196
	CAUSE6	196	196	196	196	196	196	196	196	196	196
	CAUSE7	196	196	196	196	196	196	196	196	196	196
	CAUSE8	196	196	196	196	196	196	196	196	196	196
	CAUSE9	196	196	196	196	196	196	196	196	196	196
	CAUSE10	196	196	196	196	196	196	196	196	196	196
	CAUSE11	196	196	196	196	196	196	196	196	196	196
	CAUSE12	196	196	196	196	196	196	196	196	196	196

Correlations

		CAUSE10	CAUSE11	CAUSE12
Pearson Correlation	SCP3	.306	.282	.199
	CAUSE1	.308	.361	.247
	CAUSE2	.352	.405	.129
	CAUSE3	.335	.353	.203
	CAUSE4	.479	.428	.172
	CAUSE5	.433	.320	.158
	CAUSE6	.288	.294	.287
	CAUSE7	.276	.488	.262
	CAUSE8	.448	.646	.407
	CAUSE9	.412	.638	.350
	CAUSE10	1.000	.583	.397
	CAUSE11	.583	1.000	.469
	CAUSE12	.397	.469	1.000
Sig. (1-tailed)	SCP3	.000	.000	.003
	CAUSE1	.000	.000	.000
	CAUSE2	.000	.000	.036
	CAUSE3	.000	.000	.002
	CAUSE4	.000	.000	.008
	CAUSE5	.000	.000	.014
	CAUSE6	.000	.000	.000
	CAUSE7	.000	.000	.000
	CAUSE8	.000	.000	.000
	CAUSE9	.000	.000	.000
	CAUSE10	.	.000	.000
	CAUSE11	.000	.	.000
	CAUSE12	.000	.000	.
N	SCP3	196	196	196
	CAUSE1	196	196	196
	CAUSE2	196	196	196
	CAUSE3	196	196	196
	CAUSE4	196	196	196
	CAUSE5	196	196	196
	CAUSE6	196	196	196
	CAUSE7	196	196	196
	CAUSE8	196	196	196
	CAUSE9	196	196	196
	CAUSE10	196	196	196
	CAUSE11	196	196	196
	CAUSE12	196	196	196

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4[a]	.	Enter
2	.	CAUSE9	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE11	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE7	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE6	Backward (criterion: Probability of F-to-remove >= .100).

Model	Variables Entered	Variables Removed	Method
	.	CAUSE10	Probability of F-to-remove >= .100).
8	.	CAUSE1	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE12	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE5	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP3

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.498[a]	.248	.199	1.3442	.248	5.040	12	183	.000
2	.498[b]	.248	.203	1.3409	.000	.084	1	185	.772
3	.497[c]	.247	.206	1.3384	-.001	.309	1	186	.579
4	.495[d]	.245	.209	1.3359	-.001	.332	1	187	.565
5	.494[e]	.244	.211	1.3340	-.002	.468	1	188	.495
6	.492[f]	.242	.214	1.3319	-.002	.405	1	189	.525
7	.488[g]	.238	.214	1.3316	-.004	.913	1	190	.340
8	.483[h]	.234	.213	1.3322	-.005	1.153	1	191	.284
9	.478[i]	.228	.212	1.3333	-.005	1.320	1	192	.252
10	.466[j]	.217	.205	1.3391	-.011	2.690	1	193	.103

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE1, CAUSE4
d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE1
e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE1
f. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE1
g. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE3, CAUSE5, CAUSE8, CAUSE1
h. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE3, CAUSE5, CAUSE8
i. Predictors: (Constant), CAUSE2, CAUSE3, CAUSE5, CAUSE8
j. Predictors: (Constant), CAUSE2, CAUSE3, CAUSE8
k. Dependent Variable: SCP3

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	109.289	12	9.107	5.040	.000[a]
	Residual	330.664	183	1.807		
	Total	439.953	195			
2	Regression	109.137	11	9.922	5.518	.000[b]
	Residual	330.816	184	1.798		
	Total	439.953	195			
3	Regression	108.581	10	10.858	6.062	.000[c]
	Residual	331.371	185	1.791		
	Total	439.953	195			

Model		Sum of Squares	df	Mean Square	F	Sig.
	Total	439.953	195			
5	Regression	107.152	8	13.394	7.526	.000[e]
	Residual	332.801	187	1.780		
	Total	439.953	195			
6	Regression	106.431	7	15.204	8.570	.000[f]
	Residual	333.522	188	1.774		
	Total	439.953	195			
7	Regression	104.811	6	17.468	9.851	.000[g]
	Residual	335.142	189	1.773		
	Total	439.953	195			
8	Regression	102.765	5	20.553	11.581	.000[h]
	Residual	337.188	190	1.775		
	Total	439.953	195			
9	Regression	100.422	4	25.106	14.123	.000[i]
	Residual	339.531	191	1.778		
	Total	439.953	195			
10	Regression	95.641	3	31.880	17.778	.000[j]
	Residual	344.312	192	1.793		
	Total	439.953	195			

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE1, CAUSE4
d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE1
e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE6, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE1
f. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE3, CAUSE5, CAUSE8, CAUSE1
g. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE3, CAUSE5, CAUSE8, CAUSE1
h. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE3, CAUSE5, CAUSE8
i. Predictors: (Constant), CAUSE2, CAUSE3, CAUSE5, CAUSE8
j. Predictors: (Constant), CAUSE2, CAUSE3, CAUSE8
k. Dependent Variable: SCP3

Coefficients[a]

Model		Unstandardized Coefficients: B	Std. Error	Standardized Coefficients: Beta	t	Sig.	95% Confidence Interval for B: Lower Bound	Upper Bound	Correlations: Zero-order	Partial	Part
1	(Constant)	2.183	.442		4.936	.000	1.310	3.055			
	CAUSE1	-6.336E-02	.081	-.084	-.784	.434	-.223	.096	.318	-.058	-.050
	CAUSE2	.147	.091	.194	1.612	.109	-.033	.326	.406	.118	.103
	CAUSE3	.115	.071	.152	1.608	.109	-.026	.255	.401	.118	.103
	CAUSE4	5.278E-02	.086	.071	.614	.540	-.117	.222	.410	.045	.039
	CAUSE5	9.001E-02	.081	.119	1.107	.270	-.070	.250	.380	.082	.071
	CAUSE6	-5.453E-02	.070	-.070	-.784	.434	-.192	.083	.259	-.058	-.050
	CAUSE7	4.519E-02	.066	.061	.683	.496	-.085	.176	.291	.050	.044
	CAUSE8	9.301E-02	.079	.119	1.184	.238	-.062	.248	.322	.087	.076
	CAUSE9	-1.887E-02	.065	-.027	-.290	.772	-.147	.110	.222	-.021	-.019
	CAUSE10	6.680E-02	.074	.079	.906	.366	-.079	.212	.306	.067	.058
	CAUSE11	-3.342E-02	.079	-.045	-.422	.673	-.190	.123	.282	-.031	-.027
	CAUSE12	6.766E-02	.060	.088	1.127	.261	-.051	.186	.199	.083	.072
2	(Constant)	2.166	.437		4.952	.000	1.303	3.029			
	CAUSE1	-6.774E-02	.079	-.090	-.856	.393	-.224	.088	.318	-.063	-.055
	CAUSE2	.150	.090	.198	1.664	.098	-.028	.328	.406	.122	.106
	CAUSE3	.112	.070	.149	1.587	.114	-.027	.251	.401	.116	.101
	CAUSE4	5.322E-02	.086	.072	.620	.536	-.116	.222	.410	.046	.040
	CAUSE5	9.397E-02	.080	.125	1.176	.241	-.064	.252	.380	.086	.075
	CAUSE6	-5.680E-02	.069	-.073	-.824	.411	-.193	.079	.259	-.061	-.053
	CAUSE7	4.442E-02	.066	.060	.674	.501	-.086	.175	.291	.050	.043
	CAUSE8	8.652E-02	.075	.111	1.152	.251	-.062	.235	.322	.085	.074
	CAUSE10	6.526E-02	.073	.077	.889	.375	-.080	.210	.306	.065	.057
	CAUSE11	-4.126E-02	.074	-.055	-.556	.579	-.188	.105	.282	-.041	-.036
	CAUSE12	6.864E-02	.060	.089	1.148	.253	-.049	.187	.199	.084	.073
3	(Constant)	2.198	.433		5.079	.000	1.344	3.052			
	CAUSE1	-6.522E-02	.079	-.086	-.827	.409	-.221	.090	.318	-.061	-.053
	CAUSE2	.145	.089	.191	1.618	.107	-.032	.321	.406	.118	.103
	CAUSE3	.112	.070	.149	1.598	.112	-.026	.251	.401	.117	.102
	CAUSE4	4.914E-02	.085	.066	.576	.565	-.119	.217	.410	.042	.037
	CAUSE5	9.641E-02	.080	.128	1.210	.228	-.061	.254	.380	.089	.077
	CAUSE6	-5.150E-02	.068	-.066	-.755	.451	-.186	.083	.259	-.055	-.048
	CAUSE7	3.738E-02	.065	.050	.579	.564	-.090	.165	.291	.043	.037
	CAUSE8	7.119E-02	.070	.091	1.021	.309	-.066	.209	.322	.075	.065
	CAUSE10	5.160E-02	.069	.061	.748	.456	-.085	.188	.306	.055	.048
	CAUSE12	6.044E-02	.058	.079	1.045	.297	-.054	.175	.199	.077	.067

Analysis for Ca-SCP3-AR

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	2.192	.432		5.075	.000	1.340	3.044			
	CAUSE1	-6.766E-02	.079	-.090	-.861	.391	-.223	.087	.318	-.063	-.055
	CAUSE2	.162	.084	.215	1.938	.054	-.003	.328	.406	.141	.123
	CAUSE3	.119	.069	.159	1.728	.086	-.017	.256	.401	.126	.110
	CAUSE5	.117	.071	.155	1.644	.102	-.023	.257	.380	.120	.105
	CAUSE6	-5.424E-02	.068	-.070	-.799	.425	-.188	.080	.259	-.058	-.051
	CAUSE7	4.352E-02	.064	.059	.684	.495	-.082	.169	.291	.050	.044
	CAUSE8	6.757E-02	.069	.087	.975	.331	-.069	.204	.322	.071	.062
	CAUSE10	6.049E-02	.067	.071	.901	.369	-.072	.193	.306	.066	.057
	CAUSE12	6.007E-02	.058	.078	1.040	.299	-.054	.174	.199	.076	.066
5	(Constant)	2.214	.430		5.148	.000	1.365	3.062			
	CAUSE1	-6.959E-02	.078	-.092	-.887	.376	-.224	.085	.318	-.065	-.056
	CAUSE2	.166	.084	.220	1.992	.048	.002	.331	.406	.144	.127
	CAUSE3	.131	.067	.174	1.953	.052	-.001	.263	.401	.141	.124
	CAUSE5	.110	.070	.146	1.564	.120	-.029	.249	.380	.114	.099
	CAUSE6	-4.149E-02	.065	-.054	-.636	.525	-.170	.087	.259	-.046	-.040
	CAUSE8	8.566E-02	.064	.110	1.339	.182	-.041	.212	.322	.097	.085
	CAUSE10	5.967E-02	.067	.070	.890	.375	-.073	.192	.306	.065	.057
	CAUSE12	6.006E-02	.058	.078	1.042	.299	-.054	.174	.199	.076	.066
6	(Constant)	2.198	.429		5.127	.000	1.352	3.043			
	CAUSE1	-7.526E-02	.078	-.100	-.967	.335	-.229	.078	.318	-.070	-.061
	CAUSE2	.167	.083	.220	2.001	.047	.002	.331	.406	.144	.127
	CAUSE3	.126	.066	.167	1.895	.060	-.005	.257	.401	.137	.120
	CAUSE5	9.488E-02	.066	.126	1.436	.153	-.036	.225	.380	.104	.091
	CAUSE8	7.788E-02	.063	.100	1.242	.216	-.046	.202	.322	.090	.079
	CAUSE10	6.368E-02	.067	.075	.956	.340	-.068	.195	.306	.070	.061
	CAUSE12	5.472E-02	.057	.071	.961	.338	-.058	.167	.199	.070	.061
7	(Constant)	2.314	.411		5.633	.000	1.504	3.125			
	CAUSE1	-8.310E-02	.077	-.110	-1.074	.284	-.236	.070	.318	-.078	-.068
	CAUSE2	.175	.083	.231	2.106	.037	.011	.338	.406	.151	.134
	CAUSE3	.127	.066	.169	1.911	.058	-.004	.258	.401	.138	.121
	CAUSE5	.111	.064	.148	1.743	.083	-.015	.237	.380	.126	.111
	CAUSE8	9.123E-02	.061	.117	1.493	.137	-.029	.212	.322	.108	.095
	CAUSE12	7.039E-02	.055	.091	1.291	.198	-.037	.178	.199	.094	.082

Analysis for Ca-SCP3-AR

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
8	(Constant)	2.260	.408		5.540	.000	1.455	3.064			
	CAUSE2	.125	.069	.166	1.814	.071	-.011	.262	.406	.130	.115
	CAUSE3	.120	.066	.160	1.821	.070	-.010	.251	.401	.131	.116
	CAUSE5	.103	.063	.137	1.627	.105	-.022	.228	.380	.117	.103
	CAUSE8	8.260E-02	.061	.106	1.363	.175	-.037	.202	.322	.098	.087
	CAUSE12	6.203E-02	.054	.081	1.149	.252	-.044	.169	.199	.083	.073
9	(Constant)	2.446	.375		6.531	.000	1.707	3.185			
	CAUSE2	.116	.069	.154	1.693	.092	-.019	.252	.406	.122	.108
	CAUSE3	.128	.066	.171	1.952	.052	-.001	.258	.401	.140	.124
	CAUSE5	.104	.063	.138	1.640	.103	-.021	.229	.380	.118	.104
	CAUSE8	.109	.056	.139	1.939	.054	-.002	.220	.322	.139	.123
10	(Constant)	2.562	.369		6.935	.000	1.833	3.291			
	CAUSE2	.153	.065	.202	2.340	.020	.024	.282	.406	.166	.149
	CAUSE3	.162	.063	.215	2.576	.011	.038	.286	.401	.183	.164
	CAUSE8	.119	.056	.153	2.127	.035	.009	.230	.322	.152	.136

Coefficients[a]

Model		Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)		
	CAUSE1	.359	2.785
	CAUSE2	.284	3.520
	CAUSE3	.457	2.186
	CAUSE4	.307	3.261
	CAUSE5	.353	2.833
	CAUSE6	.510	1.961
	CAUSE7	.515	1.942
	CAUSE8	.406	2.462
	CAUSE9	.459	2.177
	CAUSE10	.543	1.841
	CAUSE11	.366	2.732
	CAUSE12	.675	1.482
2	(Constant)		
	CAUSE1	.372	2.687
	CAUSE2	.288	3.469
	CAUSE3	.466	2.144
	CAUSE4	.307	3.260
	CAUSE5	.363	2.753
	CAUSE6	.517	1.936
	CAUSE7	.516	1.939
	CAUSE8	.442	2.262
	CAUSE10	.546	1.832
	CAUSE11	.414	2.413
	CAUSE12	.677	1.477
3	(Constant)		
	CAUSE1	.373	2.679
	CAUSE2	.291	3.431
	CAUSE3	.467	2.143
	CAUSE4	.309	3.236
	CAUSE5	.364	2.744
	CAUSE6	.527	1.899
	CAUSE7	.535	1.868
	CAUSE8	.511	1.957
	CAUSE10	.615	1.627
	CAUSE12	.721	1.387

Coefficients[a]

Model		Collinearity Statistics Tolerance	Collinearity Statistics VIF
4	(Constant)		
	CAUSE1	.374	2.671
	CAUSE2	.331	3.023
	CAUSE3	.481	2.078
	CAUSE5	.455	2.196
	CAUSE6	.529	1.890
	CAUSE7	.550	1.817
	CAUSE8	.515	1.941
	CAUSE10	.647	1.545
	CAUSE12	.721	1.387
5	(Constant)		
	CAUSE1	.375	2.667
	CAUSE2	.332	3.010
	CAUSE3	.511	1.958
	CAUSE5	.465	2.151
	CAUSE6	.572	1.747
	CAUSE8	.603	1.659
	CAUSE10	.647	1.545
	CAUSE12	.721	1.387
6	(Constant)		
	CAUSE1	.380	2.633
	CAUSE2	.332	3.010
	CAUSE3	.518	1.931
	CAUSE5	.524	1.908
	CAUSE8	.626	1.598
	CAUSE10	.653	1.531
	CAUSE12	.737	1.358
7	(Constant)		
	CAUSE1	.384	2.604
	CAUSE2	.336	2.980
	CAUSE3	.518	1.930
	CAUSE5	.562	1.780
	CAUSE8	.658	1.519
	CAUSE12	.803	1.245

Analysis for Ca-SCP3-AR

Analysis for Ca-SCP3-AR

	CAUSE_1	.327	1.000	.850	.628	.625	.540	.224	.433	.436	.416
	CAUSE_2	.367	.850	1.000	.622	.759	.595	.164	.564	.530	.543
	CAUSE_3	.437	.628	.622	1.000	.598	.633	.211	.426	.379	.350
	CAUSE_4	.411	.625	.759	.598	1.000	.785	.285	.548	.447	.549
	CAUSE_5	.366	.540	.595	.633	.785	1.000	.274	.378	.389	.396
	CAUSE_6	-.098	.224	.164	.211	.285	.274	1.000	.282	.234	.159
	CAUSE_7	.380	.433	.564	.426	.548	.378	.282	1.000	.694	.552
	CAUSE_8	.364	.436	.530	.379	.447	.389	.234	.694	1.000	.784
	CAUSE_9	.431	.416	.543	.350	.549	.396	.159	.552	.784	1.000
	CAUSE_10	.265	.253	.309	.185	.359	.327	.086	.393	.664	.694
	CAUSE_11	.333	.341	.456	.217	.400	.340	.044	.524	.797	.760
	CAUSE_12	.072	.248	.108	.092	.088	.168	.099	.110	.396	.372
Sig. (1-tailed)	SCP3	.	.007	.003	.000	.001	.003	.239	.002	.003	.001
	CAUSE_1	.007	.	.000	.000	.000	.000	.050	.000	.000	.001
	CAUSE_2	.003	.000	.	.000	.000	.000	.116	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.061	.001	.002	.004
	CAUSE_4	.001	.000	.000	.000	.	.000	.017	.000	.000	.000
	CAUSE_5	.003	.000	.000	.000	.000	.	.022	.002	.002	.001
	CAUSE_6	.239	.050	.116	.061	.017	.022	.	.019	.043	.123
	CAUSE_7	.002	.000	.000	.001	.000	.002	.019	.	.000	.000
	CAUSE_8	.003	.000	.000	.002	.000	.002	.043	.000	.	.000
	CAUSE_9	.001	.001	.000	.004	.000	.001	.123	.000	.000	.
	CAUSE_10	.025	.031	.011	.088	.004	.007	.267	.001	.000	.000
	CAUSE_11	.006	.005	.000	.056	.001	.006	.375	.000	.000	.000
	CAUSE_12	.302	.034	.217	.251	.263	.110	.236	.212	.001	.003
N	SCP3	55	55	55	55	55	55	55	55	55	55
	CAUSE_1	55	55	55	55	55	55	55	55	55	55
	CAUSE_2	55	55	55	55	55	55	55	55	55	55
	CAUSE_3	55	55	55	55	55	55	55	55	55	55
	CAUSE_4	55	55	55	55	55	55	55	55	55	55
	CAUSE_5	55	55	55	55	55	55	55	55	55	55
	CAUSE_6	55	55	55	55	55	55	55	55	55	55
	CAUSE_7	55	55	55	55	55	55	55	55	55	55
	CAUSE_8	55	55	55	55	55	55	55	55	55	55
	CAUSE_9	55	55	55	55	55	55	55	55	55	55
	CAUSE_10	55	55	55	55	55	55	55	55	55	55
	CAUSE_11	55	55	55	55	55	55	55	55	55	55
	CAUSE_12	55	55	55	55	55	55	55	55	55	55

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP3	.265	.333	.072
	CAUSE_1	.253	.341	.248
	CAUSE_2	.309	.456	.108
	CAUSE_3	.185	.217	.092
	CAUSE_4	.359	.400	.088
	CAUSE_5	.327	.340	.168
	CAUSE_6	.086	.044	.099
	CAUSE_7	.393	.524	.110
	CAUSE_8	.664	.797	.396
	CAUSE_9	.694	.760	.372
	CAUSE_10	1.000	.724	.544
	CAUSE_11	.724	1.000	.370
	CAUSE_12	.544	.370	1.000
Sig. (1-tailed)	SCP3	.025	.006	.302
	CAUSE_1	.031	.005	.034
	CAUSE_2	.011	.000	.217
	CAUSE_3	.088	.056	.251
	CAUSE_4	.004	.001	.263
	CAUSE_5	.007	.006	.110
	CAUSE_6	.267	.375	.236
	CAUSE_7	.001	.000	.212
	CAUSE_8	.000	.000	.001
	CAUSE_9	.000	.000	.003
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.003
	CAUSE_12	.000	.003	.
N	SCP3	55	55	55
	CAUSE_1	55	55	55
	CAUSE_2	55	55	55
	CAUSE_3	55	55	55
	CAUSE_4	55	55	55
	CAUSE_5	55	55	55
	CAUSE_6	55	55	55
	CAUSE_7	55	55	55
	CAUSE_8	55	55	55
	CAUSE_9	55	55	55
	CAUSE_10	55	55	55
	CAUSE_11	55	55	55
	CAUSE_12	55	55	55

Analysis for Ca-SCP3-MC

Model		Tolerance	VIF
8	(Constant)		
	CAUSE2	.484	2.067
	CAUSE3	.522	1.915
	CAUSE5	.570	1.755
	CAUSE8	.670	1.493
	CAUSE12	.820	1.220
9	(Constant)		
	CAUSE2	.490	2.041
	CAUSE3	.528	1.894
	CAUSE5	.570	1.755
	CAUSE8	.781	1.280
10	(Constant)		
	CAUSE2	.547	1.827
	CAUSE3	.584	1.712
	CAUSE8	.791	1.264

a. Dependent Variable: SCP3

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP3	5.273	1.2975	55
CAUSE_1	5.391	2.2196	55
CAUSE_2	5.464	2.1897	55
CAUSE_3	5.400	2.2307	55
CAUSE_4	5.764	2.4092	55
CAUSE_5	5.500	2.2812	55
CAUSE_6	5.655	9.0615	55
CAUSE_7	4.600	2.4578	55
CAUSE_8	5.482	2.2770	55
CAUSE_9	4.809	2.1398	55
CAUSE_10	6.400	1.9940	55
CAUSE_11	4.891	2.3935	55
CAUSE_12	5.245	2.2564	55

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.611[a]	.373	.194	1.1646	.373	2.086	12	42	.040
2	.611[b]	.373	.213	1.1510	.000	.000	1	44	.998
3	.611[c]	.373	.231	1.1378	.000	.000	1	45	.984
4	.610[d]	.373	.247	1.1258	-.001	.054	1	46	.817
5	.608[e]	.370	.260	1.1158	-.003	.185	1	47	.669
6	.604[f]	.365	.270	1.1085	-.005	.388	1	48	.536
7	.601[g]	.361	.281	1.1002	-.004	.282	1	49	.598
8	.593[h]	.351	.285	1.0972	-.010	.737	1	50	.395
9	.588[i]	.346	.293	1.0908	-.006	.419	1	51	.520
10	.573[j]	.329	.289	1.0940	-.017	1.295	1	52	.260

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_2
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_9, CAUSE_2
f. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_9, CAUSE_2
g. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_9, CAUSE_2
h. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_9
i. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_9
j. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_9
k. Dependent Variable: SCP3

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.945	12	2.829	2.086	.040[a]
	Residual	56.964	42	1.356		
	Total	90.909	54			
2	Regression	33.945	11	3.086	2.329	.024[b]
	Residual	56.964	43	1.325		
	Total	90.909	54			
3	Regression	33.945	10	3.394	2.622	.014[c]
	Residual	56.964	44	1.295		
	Total	90.909	54			

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	33.875	9	3.764	2.970	.007[d]
	Residual	57.035	45	1.267		
	Total	90.909	54			
5	Regression	33.641	8	4.205	3.378	.004[e]
	Residual	57.269	46	1.245		
	Total	90.909	54			
6	Regression	33.157	7	4.737	3.855	.002[f]
	Residual	57.752	47	1.229		
	Total	90.909	54			
7	Regression	32.811	6	5.468	4.518	.001[g]
	Residual	58.098	48	1.210		
	Total	90.909	54			
8	Regression	31.919	5	6.384	5.303	.001[h]
	Residual	58.991	49	1.204		
	Total	90.909	54			
9	Regression	31.414	4	7.853	6.600	.000[i]
	Residual	59.495	50	1.190		
	Total	90.909	54			
10	Regression	29.872	3	9.957	8.320	.000[j]
	Residual	61.037	51	1.197		
	Total	90.909	54			

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_9, CAUSE_2
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_9, CAUSE_2
f. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_9, CAUSE_2
g. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_9, CAUSE_2
h. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_9
i. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_9
j. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_9
k. Dependent Variable: SCP3

Analysis for Ca-SCP3-MC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2[a]	.	Enter
2	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP3

Analysis for Ca-SCP3-MC

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	3.223	.459		7.029	.000	2.301	4.144			
	CAUSE_3	.165	.084	.284	1.959	.056	-.004	.335	.437	.269	.225
	CAUSE_4	5.843E-02	.090	.103	.648	.520	-.123	.240	.411	.092	.075
	CAUSE_6	-3.825E-02	.017	-.267	-2.193	.033	-.073	-.003	-.098	-.299	-.252
	CAUSE_7	7.704E-02	.080	.146	.967	.338	-.083	.237	.380	.137	.111
	CAUSE_9	.142	.090	.234	1.582	.120	-.038	.322	.431	.220	.182
9	(Constant)	3.275	.449		7.295	.000	2.373	4.176			
	CAUSE_3	.190	.075	.327	2.542	.014	.040	.341	.437	.338	.291
	CAUSE_6	-3.666E-02	.017	-.256	-2.135	.035	-.071	-.002	-.098	-.289	-.244
	CAUSE_7	8.809E-02	.077	.167	1.138	.260	-.067	.244	.380	.159	.130
	CAUSE_9	.161	.084	.265	1.909	.062	-.008	.330	.431	.261	.218
10	(Constant)	3.318	.449		7.398	.000	2.418	4.219			
	CAUSE_3	.213	.072	.366	2.949	.005	.068	.358	.437	.382	[illegible]
	CAUSE_6	-3.281E-02	.017	-.229	-1.944	.057	-.067	.001	-.098	-.263	[illegible]
	CAUSE_9	.206	.075	.339	2.757	.008	.056	.355	.431	.360	[illegible]

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	3.454	.651		5.308	.000	2.141	4.767			
	CAUSE_1	.104	.153	.179	.677	.502	-.205	.413	.327	.104	.083
	CAUSE_2	-.193	.187	-.326	-1.033	.307	-.570	.184	.367	-.157	-.126
	CAUSE_3	.157	.107	.269	1.463	.151	-.059	.373	.437	.220	.179
	CAUSE_4	6.968E-02	.149	.129	.468	.642	-.231	.370	.411	.072	.057
	CAUSE_5	5.541E-02	.127	.097	.436	.665	-.201	.312	.366	.067	.053
	CAUSE_6	-4.290E-02	.020	-.300	-2.170	.036	-.083	-.003	-.098	-.318	-.265
	CAUSE_7	.102	.103	.193	.991	.327	-.106	.309	.380	.151	.121
	CAUSE_8	-3.048E-03	.161	-.005	-.019	.985	-.328	.322	.364	-.003	-.002
	CAUSE_9	.203	.146	.335	1.388	.173	-.092	.498	.431	.209	.170
	CAUSE_10	-2.816E-02	.137	-.043	-.206	.838	-.304	.248	.265	-.032	-.025
	CAUSE_11	3.678E-04	.132	.001	.003	.998	-.267	.267	.333	.000	.000
	CAUSE_12	-4.664E-02	.093	-.081	-.500	.619	-.235	.141	.072	-.077	-.061
2	(Constant)	3.454	.637		5.422	.000	2.169	4.738			
	CAUSE_1	.104	.151	.179	.685	.497	-.202	.409	.327	.104	.083
	CAUSE_2	-.193	.184	-.326	-1.048	.300	-.564	.178	.367	-.158	-.127
	CAUSE_3	.157	.104	.269	1.513	.138	-.052	.365	.437	.225	.183
	CAUSE_4	6.965E-02	.147	.129	.474	.638	-.227	.366	.411	.072	.057
	CAUSE_5	5.545E-02	.125	.097	.445	.659	-.196	.307	.366	.068	.054
	CAUSE_6	-4.291E-02	.019	-.300	-2.245	.030	-.081	-.004	-.098	-.324	-.271
	CAUSE_7	.102	.102	.193	1.003	.321	-.103	.307	.380	.151	.121
	CAUSE_8	-2.865E-03	.145	-.005	-.020	.984	-.296	.290	.364	-.003	-.002
	CAUSE_9	.203	.141	.335	1.443	.156	-.081	.487	.431	.215	.174
	CAUSE_10	-2.804E-02	.128	-.043	-.219	.828	-.287	.231	.265	-.033	-.026
	CAUSE_12	-4.666E-02	.092	-.081	-.508	.614	-.232	.139	.072	-.077	-.061
3	(Constant)	3.454	.629		5.490	.000	2.186	4.722			
	CAUSE_1	.104	.150	.179	.694	.492	-.198	.406	.327	.104	.083
	CAUSE_2	-.194	.180	-.327	-1.074	.288	-.557	.170	.367	-.160	-.128
	CAUSE_3	.157	.102	.269	1.531	.133	-.050	.363	.437	.225	.183
	CAUSE_4	7.057E-02	.138	.131	.513	.611	-.207	.348	.411	.077	.061
	CAUSE_5	5.506E-02	.122	.097	.452	.653	-.190	.300	.366	.068	.054
	CAUSE_6	-4.296E-02	.019	-.300	-2.290	.027	-.081	-.005	-.098	-.326	-.273
	CAUSE_7	.101	.086	.191	1.167	.250	-.073	.275	.380	.173	.139
	CAUSE_9	.202	.121	.333	1.660	.104	-.043	.446	.431	.243	.198
	CAUSE_10	-2.864E-02	.123	-.044	-.233	.817	-.277	.219	.265	-.035	-.028
	CAUSE_12	-4.687E-02	.090	-.082	-.520	.606	-.229	.135	.072	-.078	-.062

Analysis for Ca-SCP3-MC

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.150	6.668
	CAUSE_3	.440	2.272
	CAUSE_4	.195	5.125
	CAUSE_5	.299	3.343
	CAUSE_6	.783	1.277
	CAUSE_7	.394	2.541
	CAUSE_8	.187	5.351
	CAUSE_9	.257	3.897
	CAUSE_10	.337	2.964
	CAUSE_11	.250	3.995
	CAUSE_12	.568	1.761
2	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.151	6.629
	CAUSE_3	.460	2.173
	CAUSE_4	.196	5.106
	CAUSE_5	.303	3.299
	CAUSE_6	.818	1.223
	CAUSE_7	.394	2.541
	CAUSE_8	.225	4.453
	CAUSE_9	.271	3.695
	CAUSE_10	.375	2.664
	CAUSE_12	.571	1.751
3	(Constant)		
	CAUSE_1	.213	4.688
	CAUSE_2	.154	6.493
	CAUSE_3	.461	2.170
	CAUSE_4	.218	4.589
	CAUSE_5	.311	3.216
	CAUSE_6	.830	1.205
	CAUSE_7	.531	1.884
	CAUSE_9	.355	2.817
	CAUSE_10	.398	2.514
	CAUSE_12	.579	1.727

Analysis for Ca-SCP3-MC

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
4	(Constant)	3.387	.554		6.113	.000	2.271	4.503			
	CAUSE_1	.106	.148	.183	.718	.477	-.192	.404	.327	.106	.085
	CAUSE_2	-.193	.178	-.325	-1.080	.286	-.551	.166	.367	-.159	-.128
	CAUSE_3	.159	.101	.273	1.578	.122	-.044	.362	.437	.229	.186
	CAUSE_4	7.024E-02	.136	.130	.516	.609	-.204	.345	.411	.077	.061
	CAUSE_5	5.129E-02	.119	.090	.430	.669	-.189	.292	.366	.064	.051
	CAUSE_6	-4.255E-02	.018	-.297	-2.302	.026	-.080	-.005	-.098	-.325	-.272
	CAUSE_7	9.826E-02	.085	.186	1.158	.253	-.073	.269	.380	.170	.137
	CAUSE_9	.187	.104	.309	1.809	.077	-.021	.396	.431	.260	.214
	CAUSE_12	-5.563E-02	.081	-.097	-.686	.496	-.219	.108	.072	-.102	-.081
5	(Constant)	3.407	.547		6.226	.000	2.306	4.509			
	CAUSE_1	.104	.146	.180	.712	.480	-.190	.399	.327	.104	.083
	CAUSE_2	-.194	.177	-.328	-1.101	.277	-.550	.161	.367	-.160	-.129
	CAUSE_3	.174	.094	.299	1.856	.070	-.015	.362	.437	.264	.217
	CAUSE_4	.106	.107	.196	.987	.329	-.110	.322	.411	.144	.116
	CAUSE_6	-4.198E-02	.018	-.293	-2.298	.026	-.079	-.005	-.098	-.321	-.269
	CAUSE_7	9.372E-02	.083	.178	1.124	.267	-.074	.262	.380	.163	.131
	CAUSE_9	.183	.102	.302	1.794	.079	-.022	.389	.431	.256	.210
	CAUSE_12	-4.922E-02	.079	-.086	-.623	.536	-.208	.110	.072	-.091	-.073
6	(Constant)	3.239	.473		6.854	.000	2.288	4.189			
	CAUSE_1	7.235E-02	.136	.125	.531	.598	-.202	.347	.327	.077	.062
	CAUSE_2	-.165	.169	-.278	-.975	.334	-.504	.175	.367	-.141	-.113
	CAUSE_3	.176	.093	.303	1.897	.064	-.011	.363	.437	.267	.221
	CAUSE_4	.111	.106	.205	1.041	.303	-.103	.324	.411	.150	.121
	CAUSE_6	-4.227E-02	.018	-.295	-2.330	.024	-.079	-.006	-.098	-.322	-.271
	CAUSE_7	9.630E-02	.083	.182	1.163	.251	-.070	.263	.380	.167	.135
	CAUSE_9	.156	.092	.257	1.701	.096	-.029	.341	.431	.241	.198
7	(Constant)	3.276	.464		7.062	.000	2.343	4.208			
	CAUSE_2	-.101	.117	-.170	-.859	.395	-.336	.135	.367	-.123	-.099
	CAUSE_3	.189	.089	.325	2.123	.039	.010	.368	.437	.293	.245
	CAUSE_4	.103	.105	.192	.989	.327	-.107	.314	.411	.141	.114
	CAUSE_6	-4.042E-02	.018	-.282	-2.287	.027	-.076	-.005	-.098	-.313	-.264
	CAUSE_7	9.056E-02	.081	.172	1.112	.272	-.073	.254	.380	.158	.128
	CAUSE_9	.154	.091	.254	1.693	.097	-.029	.337	.431	.237	.195

Analysis for Ca-SCP3-MC

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP3	4.808	1.5141	117
CAUSE_1	6.329	1.6945	117
CAUSE_2	5.368	1.7731	117
CAUSE_3	5.581	1.7665	117
CAUSE_4	5.350	1.6417	117
CAUSE_5	5.261	1.6976	117
CAUSE_6	5.171	1.7034	117
CAUSE_7	5.500	1.7145	117
CAUSE_8	6.444	1.6697	117
CAUSE_9	7.162	1.6646	117
CAUSE_10	5.615	1.5134	117
CAUSE_11	5.551	1.6287	117
CAUSE_12	5.765	1.7039	117

Correlations

		SCP3	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP3	1.000	.306	.351	.320	.323	.336	.273	.267	.286	.289
	CAUSE_1	.306	1.000	.662	.486	.432	.520	.496	.329	.453	.384
	CAUSE_2	.351	.662	1.000	.607	.561	.516	.445	.355	.402	.390
	CAUSE_3	.320	.486	.607	1.000	.624	.565	.566	.500	.319	.473
	CAUSE_4	.323	.432	.561	.624	1.000	.644	.472	.420	.395	.386
	CAUSE_5	.336	.520	.516	.565	.644	1.000	.654	.405	.446	.376
	CAUSE_6	.273	.496	.445	.566	.472	.654	1.000	.481	.417	.464
	CAUSE_7	.267	.329	.355	.500	.420	.405	.481	1.000	.416	.331
	CAUSE_8	.286	.453	.402	.319	.395	.446	.417	.416	1.000	.478
	CAUSE_9	.289	.384	.390	.473	.386	.376	.464	.331	.478	1.000
	CAUSE_10	.234	.331	.265	.394	.487	.492	.348	.229	.339	.502
	CAUSE_11	.228	.288	.386	.406	.495	.429	.356	.418	.483	.537
	CAUSE_12	.210	.199	.112	.218	.237	.238	.278	.292	.350	.289
Sig. (1-tailed)	SCP3	.	.000	.000	.000	.000	.000	.001	.002	.001	.001
	CAUSE_1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE_4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE_5	.000	.000	.000	.000	.000	.	.000	.000	.000	.000
	CAUSE_6	.001	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE_7	.002	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE_8	.001	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE_9	.001	.000	.000	.000	.000	.000	.000	.000	.000	.
	CAUSE_10	.006	.000	.002	.000	.000	.000	.000	.006	.000	.000
	CAUSE_11	.007	.001	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_12	.012	.016	.114	.009	.005	.005	.001	.001	.000	.001
N	SCP3	117	117	117	117	117	117	117	117	117	117
	CAUSE_1	117	117	117	117	117	117	117	117	117	117
	CAUSE_2	117	117	117	117	117	117	117	117	117	117
	CAUSE_3	117	117	117	117	117	117	117	117	117	117
	CAUSE_4	117	117	117	117	117	117	117	117	117	117
	CAUSE_5	117	117	117	117	117	117	117	117	117	117
	CAUSE_6	117	117	117	117	117	117	117	117	117	117
	CAUSE_7	117	117	117	117	117	117	117	117	117	117
	CAUSE_8	117	117	117	117	117	117	117	117	117	117
	CAUSE_9	117	117	117	117	117	117	117	117	117	117

Analysis for Ca-SCP3-SC

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE_1	.214	4.668
	CAUSE_2	.154	6.489
	CAUSE_3	.465	2.149
	CAUSE_4	.218	4.588
	CAUSE_5	.317	3.159
	CAUSE_6	.837	1.195
	CAUSE_7	.540	1.852
	CAUSE_9	.478	2.090
	CAUSE_12	.701	1.426
5	(Constant)		
	CAUSE_1	.214	4.664
	CAUSE_2	.154	6.485
	CAUSE_3	.529	1.892
	CAUSE_4	.346	2.892
	CAUSE_6	.841	1.188
	CAUSE_7	.548	1.823
	CAUSE_9	.482	2.074
	CAUSE_12	.726	1.378
6	(Constant)		
	CAUSE_1	.244	4.094
	CAUSE_2	.166	6.011
	CAUSE_3	.529	1.889
	CAUSE_4	.348	2.878
	CAUSE_6	.842	1.188
	CAUSE_7	.550	1.819
	CAUSE_9	.590	1.694
7	(Constant)		
	CAUSE_2	.341	2.932
	CAUSE_3	.568	1.761
	CAUSE_4	.353	2.832
	CAUSE_6	.874	1.144
	CAUSE_7	.559	1.788
	CAUSE_9	.591	1.691

Analysis for Ca-SCP3-MC

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
8	(Constant)		
	CAUSE_3	.628	1.592
	CAUSE_4	.472	2.119
	CAUSE_6	.892	1.121
	CAUSE_7	.581	1.721
	CAUSE_9	.606	1.649
9	(Constant)		
	CAUSE_3	.791	1.265
	CAUSE_6	.910	1.099
	CAUSE_7	.609	1.642
	CAUSE_9	.679	1.473
10	(Constant)		
	CAUSE_3	.853	1.173
	CAUSE_6	.947	1.056
	CAUSE_9	.870	1.149

a. Dependent Variable: SCP3

7	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP3

Model Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.443[a]	.197	.104	1.4332	.197	2.121	12	104	.021
2	.443[b]	.197	.112	1.4265	.000	.010	1	106	.921
3	.443[c]	.196	.120	1.4199	.000	.034	1	107	.855
4	.443[d]	.196	.128	1.4135	.000	.037	1	108	.848
5	.441[e]	.195	.135	1.4080	-.001	.162	1	109	.688
6	.439[f]	.193	.141	1.4032	-.002	.250	1	110	.618
7	.437[g]	.191	.147	1.3987	-.002	.291	1	111	.591
8	.434[h]	.188	.152	1.3943	-.002	.314	1	112	.576
9	.429[i]	.184	.155	1.3918	-.004	.594	1	113	.443
10	.417[j]	.174	.152	1.3940	-.010	1.351	1	114	.248
11	.395[k]	.156	.141	1.4033	-.019	2.533	1	115	.114

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_5

e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_5

f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_5

g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_11, CAUSE_5

h. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_5

i. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_9, CAUSE_5

j. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_5

k. Predictors: (Constant), CAUSE_2, CAUSE_5

l. Dependent Variable: SCP3

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.291	12	4.358	2.121	.021[a]
	Residual	213.632	104	2.054		
	Total	265.923	116			
2	Regression	52.270	11	4.752	2.335	.013[b]
	Residual	213.653	105	2.035		
	Total	265.923	116			

Analysis for Ca-SCP3-SC

	CAUSE_1	.331	.288	.199
	CAUSE_2	.265	.386	.112
	CAUSE_3	.394	.406	.218
	CAUSE_4	.487	.495	.237
	CAUSE_5	.492	.429	.238
	CAUSE_6	.348	.356	.278
	CAUSE_7	.229	.418	.292
	CAUSE_8	.339	.483	.350
	CAUSE_9	.502	.537	.289
	CAUSE_10	1.000	.506	.349
	CAUSE_11	.506	1.000	.392
	CAUSE_12	.349	.392	1.000
Sig. (1-tailed)	SCP3	.006	.007	.012
	CAUSE_1	.000	.001	.016
	CAUSE_2	.002	.000	.114
	CAUSE_3	.000	.000	.009
	CAUSE_4	.000	.000	.005
	CAUSE_5	.000	.000	.005
	CAUSE_6	.000	.000	.001
	CAUSE_7	.006	.000	.001
	CAUSE_8	.000	.000	.000
	CAUSE_9	.000	.000	.001
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.000
	CAUSE_12	.000	.000	.
N	SCP3	117	117	117
	CAUSE_1	117	117	117
	CAUSE_2	117	117	117
	CAUSE_3	117	117	117
	CAUSE_4	117	117	117
	CAUSE_5	117	117	117
	CAUSE_6	117	117	117
	CAUSE_7	117	117	117
	CAUSE_8	117	117	117
	CAUSE_9	117	117	117
	CAUSE_10	117	117	117
	CAUSE_11	117	117	117
	CAUSE_12	117	117	117

Analysis for Ca-SCP3-SC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5[a]	.	Enter
2	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP3-SC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	1.372	.709		2.218	.029	.167	2.977			
	CAUSE_2	.160	.096	.187	1.662	.099	-.031	.351	.351	.159	.144
	CAUSE_4	6.275E-02	.116	.068	.539	.591	-.168	.294	.323	.052	.047
	CAUSE_5	.121	.121	.136	1.001	.319	-.119	.361	.336	.096	.087
	CAUSE_6	-4.531E-02	.113	-.051	-.402	.688	-.269	.178	.273	-.039	-.035
	CAUSE_7	7.305E-02	.094	.083	.774	.441	-.114	.260	.267	.075	.067
	CAUSE_8	5.096E-02	.101	.056	.504	.615	-.149	.251	.286	.049	.044
	CAUSE_9	.113	.103	.124	1.098	.275	-.091	.317	.289	.106	.095
	CAUSE_11	-8.345E-02	.110	-.090	-.757	.451	-.302	.135	.228	-.073	-.066
	CAUSE_12	9.745E-02	.087	.110	1.117	.267	-.076	.270	.210	.107	.097
5	(Constant)	1.586	.705		2.249	.027	.188	2.984			
	CAUSE_2	.157	.095	.183	1.640	.104	-.033	.346	.351	.156	.142
	CAUSE_4	6.404E-02	.116	.069	.552	.582	-.166	.294	.323	.053	[illegible]
	CAUSE_5	9.905E-02	.107	.111	.922	.359	-.114	.312	.336	.088	[illegible]
	CAUSE_7	6.335E-02	.091	.072	.697	.487	-.117	.243	.267	.067	[illegible]
	CAUSE_8	5.035E-02	.101	.056	.500	.618	-.149	.250	.286	.048	[illegible]
	CAUSE_9	.103	.099	.113	1.034	.303	-.094	.299	.289	.099	[illegible]
	CAUSE_11	-7.803E-02	.109	-.084	-.716	.476	-.294	.138	.228	-.069	-.062
	CAUSE_12	9.419E-02	.087	.106	1.088	.279	-.077	.266	.210	.104	[illegible]
6	(Constant)	1.646	.693		2.376	.019	.273	3.018			
	CAUSE_2	.163	.094	.190	1.723	.088	-.024	.350	.351	.163	[illegible]
	CAUSE_4	6.234E-02	.116	.068	.540	.591	-.167	.291	.323	.052	[illegible]
	CAUSE_5	.107	.106	.120	1.014	.313	-.102	.317	.336	.097	.087
	CAUSE_7	7.041E-02	.089	.080	.787	.433	-.107	.248	.267	.075	.068
	CAUSE_9	.113	.097	.124	1.171	.244	-.078	.305	.289	.111	.101
	CAUSE_11	-7.026E-02	.107	-.076	-.654	.515	-.283	.143	.228	-.062	-.056
	CAUSE_12	.101	.085	.114	1.189	.237	-.067	.270	.210	.113	.102
7	(Constant)	1.675	.688		2.433	.017	.311	3.039			
	CAUSE_2	.177	.090	.208	1.965	.052	-.001	.356	.351	.184	.169
	CAUSE_5	.131	.096	.147	1.366	.175	-.059	.321	.336	.129	.117
	CAUSE_7	7.569E-02	.089	.086	.854	.395	-.100	.251	.267	.081	.073
	CAUSE_9	.114	.096	.125	1.181	.240	-.077	.305	.289	.112	.101
	CAUSE_11	-5.892E-02	.105	-.063	-.561	.576	-.267	.149	.228	-.053	-.048
	CAUSE_12	.102	.085	.115	1.205	.231	-.066	.270	.210	.114	.103

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	52.202	10	5.220	2.589	.008[c]
	Residual	213.721	106	2.016		
	Total	265.923	116			
4	Regression	52.128	9	5.792	2.899	.004[d]
	Residual	213.795	107	1.998		
	Total	265.923	116			
5	Regression	51.805	8	6.476	3.266	.002[e]
	Residual	214.119	108	1.983		
	Total	265.923	116			
6	Regression	51.308	7	7.330	3.723	.001[f]
	Residual	214.615	109	1.969		
	Total	265.923	116			
7	Regression	50.735	6	8.456	4.322	.001[g]
	Residual	215.188	110	1.956		
	Total	265.923	116			
8	Regression	50.120	5	10.024	5.156	.000[h]
	Residual	215.803	111	1.944		
	Total	265.923	116			
9	Regression	48.965	4	12.241	6.319	.000[i]
	Residual	216.958	112	1.937		
	Total	265.923	116			
10	Regression	46.348	3	15.449	7.951	.000[j]
	Residual	219.576	113	1.943		
	Total	265.923	116			
11	Regression	41.426	2	20.713	10.518	.000[k]
	Residual	224.497	114	1.969		
	Total	265.923	116			

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_5

e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_5

f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_5

g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_11, CAUSE_5

h. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_5

i. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_9, CAUSE_5

j. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_5

k. Predictors: (Constant), CAUSE_2, CAUSE_5

l. Dependent Variable: SCP3

Analysis for Ca-SCP3-SC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
8	(Constant)	1.672	.686		2.436	.016	.312	3.031			
	CAUSE_2	.171	.089	.201	1.919	.058	-.006	.348	.351	.179	.164
	CAUSE_5	.123	.095	.138	1.302	.196	-.064	.311	.336	.123	.111
	CAUSE_7	6.705E-02	.087	.076	.771	.443	-.105	.239	.267	.073	.066
	CAUSE_9	9.454E-02	.090	.104	1.053	.295	-.083	.272	.289	.099	.090
	CAUSE_12	9.057E-02	.082	.102	1.105	.272	-.072	.253	.210	.104	.094
9	(Constant)	1.767	.674		2.623	.010	.432	3.102			
	CAUSE_2	.182	.088	.213	2.071	.041	.008	.357	.351	.192	.177
	CAUSE_5	.139	.092	.155	1.501	.136	-.044	.322	.336	.140	.128
	CAUSE_9	.103	.089	.114	1.162	.248	-.073	.279	.289	.109	.099
	CAUSE_12	.103	.080	.116	1.282	.203	-.056	.262	.210	.120	.109
10	(Constant)	2.143	.592		3.621	.000	.970	3.315			
	CAUSE_2	.208	.085	.244	2.447	.016	.040	.377	.351	.224	[illegible]
	CAUSE_5	.157	.091	.177	1.729	.086	-.023	.338	.336	.161	[illegible]
	CAUSE_12	.124	.078	.140	1.592	.114	-.030	.279	.210	.148	[illegible]
11	(Constant)	2.708	.477		5.683	.000	1.764	3.652			
	CAUSE_2	.207	.086	.242	2.411	.018	.037	.377	.351	.220	[illegible]
	CAUSE_5	.188	.090	.211	2.100	.038	.011	.366	.336	.193	[illegible]

Analysis for Ca-SCP3-SC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	1.531	.747		2.050	.043	.050	3.012			
	CAUSE_1	1.954E-02	.115	.022	.170	.866	-.209	.248	.306	.017	.015
	CAUSE_2	.146	.119	.171	1.226	.223	-.090	.381	.351	.119	.108
	CAUSE_3	2.140E-02	.118	.025	.181	.857	-.213	.256	.320	.018	.016
	CAUSE_4	5.528E-02	.125	.060	.442	.659	-.193	.303	.323	.043	.039
	CAUSE_5	.113	.128	.127	.887	.377	-.140	.367	.336	.087	.078
	CAUSE_6	-5.059E-02	.117	-.057	-.432	.667	-.283	.182	.273	-.042	-.038
	CAUSE_7	7.002E-02	.099	.079	.705	.483	-.127	.267	.267	.069	.062
	CAUSE_8	5.181E-02	.106	.057	.488	.627	-.159	.262	.286	.048	.043
	CAUSE_9	.104	.111	.115	.938	.350	-.116	.325	.289	.092	.082
	CAUSE_10	1.195E-02	.120	.012	.100	.921	-.226	.250	.234	.010	.009
	CAUSE_11	-8.223E-02	.115	-.088	-.713	.477	-.311	.146	.228	-.070	-.063
	CAUSE_12	9.434E-02	.090	.106	1.049	.297	-.084	.273	.210	.102	[illegible]
2	(Constant)	1.543	.734		2.102	.038	.088	2.998			
	CAUSE_1	2.087E-02	.114	.023	.183	.855	-.205	.247	.306	.018	[illegible]
	CAUSE_2	.144	.116	.168	1.235	.220	-.087	.374	.351	.120	[illegible]
	CAUSE_3	2.200E-02	.118	.026	.187	.852	-.211	.255	.320	.018	[illegible]
	CAUSE_4	5.758E-02	.122	.062	.471	.639	-.185	.300	.323	.046	[illegible]
	CAUSE_5	.116	.124	.130	.939	.350	-.129	.362	.336	.091	[illegible]
	CAUSE_6	-5.160E-02	.116	-.058	-.444	.658	-.282	.179	.273	-.043	[illegible]
	CAUSE_7	6.877E-02	.098	.078	.701	.485	-.126	.263	.267	.068	[illegible]
	CAUSE_8	5.126E-02	.106	.057	.486	.628	-.158	.260	.286	.047	[illegible]
	CAUSE_9	.107	.107	.118	1.009	.315	-.104	.319	.289	.098	[illegible]
	CAUSE_11	-7.989E-02	.112	-.086	-.711	.478	-.303	.143	.228	-.069	-.062
	CAUSE_12	9.578E-02	.088	.108	1.084	.281	-.079	.271	.210	.105	.095
3	(Constant)	1.573	.712		2.210	.029	.162	2.985			
	CAUSE_2	.154	.102	.180	1.504	.135	-.049	.356	.351	.145	.131
	CAUSE_3	2.247E-02	.117	.026	.192	.848	-.210	.254	.320	.019	.017
	CAUSE_4	5.643E-02	.122	.061	.464	.643	-.185	.297	.323	.045	.040
	CAUSE_5	.119	.122	.134	.978	.330	-.123	.361	.336	.095	.085
	CAUSE_6	-4.903E-02	.115	-.055	-.427	.670	-.277	.179	.273	-.041	-.037
	CAUSE_7	6.854E-02	.098	.078	.702	.484	-.125	.262	.267	.068	.061
	CAUSE_8	5.471E-02	.103	.060	.529	.598	-.150	.260	.286	.051	.046
	CAUSE_9	.109	.106	.120	1.027	.307	-.101	.318	.289	.099	.089
	CAUSE_11	-8.264E-02	.111	-.089	-.746	.457	-.302	.137	.228	[illegible]	[illegible]
	CAUSE_12	9.699E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Analysis for Ca-SCP3-SC

Model		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.669	1.495
	CAUSE_5	.649	1.540
	CAUSE_7	.753	1.328
	CAUSE_9	.751	1.332
	CAUSE_12	.859	1.165
9	(Constant)		
	CAUSE_2	.686	1.458
	CAUSE_5	.680	1.471
	CAUSE_9	.763	1.311
	CAUSE_12	.893	1.120
10	(Constant)		
	CAUSE_2	.734	1.362
	CAUSE_5	.701	1.426
	CAUSE_12	.943	1.060
11	(Constant)		
	CAUSE_2	.734	1.362
	CAUSE_5	.734	1.362

a. Dependent Variable: SCP3

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP3	5.720	1.6651	25
CAUSE_1	6.800	2.2913	25
CAUSE_2	6.680	2.1884	25
CAUSE_3	6.600	2.2913	25
CAUSE_4	6.820	2.3313	25
CAUSE_5	6.700	2.2638	25
CAUSE_6	6.200	2.2958	25
CAUSE_7	5.680	2.0355	25
CAUSE_8	6.400	1.8428	25
CAUSE_9	5.520	2.3826	25
CAUSE_10	6.440	2.0530	25
CAUSE_11	5.320	2.5612	25
CAUSE_12	5.600	2.3629	25

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.465	2.152
	CAUSE_2	.399	2.507
	CAUSE_3	.406	2.466
	CAUSE_4	.421	2.378
	CAUSE_5	.376	2.657
	CAUSE_6	.444	2.250
	CAUSE_7	.610	1.639
	CAUSE_8	.564	1.774
	CAUSE_9	.516	1.938
	CAUSE_10	.538	1.859
	CAUSE_11	.502	1.991
	CAUSE_12	.754	1.326
2	(Constant)		
	CAUSE_1	.471	2.124
	CAUSE_2	.413	2.423
	CAUSE_3	.407	2.460
	CAUSE_4	.435	2.297
	CAUSE_5	.397	2.518
	CAUSE_6	.448	2.233
	CAUSE_7	.620	1.613
	CAUSE_8	.565	1.769
	CAUSE_9	.558	1.792
	CAUSE_11	.524	1.908
	CAUSE_12	.774	1.292
3	(Constant)		
	CAUSE_2	.530	1.885
	CAUSE_3	.407	2.458
	CAUSE_4	.437	2.290
	CAUSE_5	.405	2.470
	CAUSE_6	.454	2.201
	CAUSE_7	.620	1.613
	CAUSE_8	.584	1.713
	CAUSE_9	.560	1.784
	CAUSE_11	.534	1.874
	CAUSE_12	.779	1.284

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_2	.592	1.689
	CAUSE_4	.471	2.122
	CAUSE_5	.407	2.454
	CAUSE_6	.468	2.138
	CAUSE_7	.658	1.519
	CAUSE_8	.605	1.652
	CAUSE_9	.587	1.704
	CAUSE_11	.534	1.871
	CAUSE_12	.779	1.283
5	(Constant)		
	CAUSE_2	.596	1.677
	CAUSE_4	.472	2.121
	CAUSE_5	.514	1.946
	CAUSE_7	.704	1.420
	CAUSE_8	.605	1.652
	CAUSE_9	.626	1.596
	CAUSE_11	.543	1.843
	CAUSE_12	.786	1.272
6	(Constant)		
	CAUSE_2	.606	1.650
	CAUSE_4	.472	2.119
	CAUSE_5	.526	1.900
	CAUSE_7	.721	1.386
	CAUSE_9	.656	1.524
	CAUSE_11	.554	1.806
	CAUSE_12	.807	1.239
7	(Constant)		
	CAUSE_2	.660	1.516
	CAUSE_5	.636	1.573
	CAUSE_7	.730	1.369
	CAUSE_9	.656	1.524
	CAUSE_11	.576	1.737
	CAUSE_12	.809	1.238

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4[a]	.	Enter
2	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP3

Correlations

		SCP3	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP3	1.000	.553	.603	.515	.491	.347	.462	.433	.707	.516
	CAUSE_1	.553	1.000	.942	.571	.835	.651	.440	.316	.405	.386
	CAUSE_2	.603	.942	1.000	.597	.829	.621	.442	.294	.452	.385
	CAUSE_3	.515	.571	.597	1.000	.746	.442	.202	.472	.528	.498
	CAUSE_4	.491	.835	.829	.746	1.000	.747	.281	.251	.388	.389
	CAUSE_5	.347	.651	.621	.442	.747	1.000	.423	-.080	.210	.088
	CAUSE_6	.462	.440	.442	.202	.281	.423	1.000	.277	.510	.155
	CAUSE_7	.433	.316	.294	.472	.251	-.080	.277	1.000	.530	.611
	CAUSE_8	.707	.405	.452	.528	.388	.210	.510	.530	1.000	.748
	CAUSE_9	.516	.386	.385	.498	.389	.088	.155	.611	.748	1.000
	CAUSE_10	.440	.617	.624	.500	.631	.424	.414	.404	.665	.718
	CAUSE_11	.520	.452	.413	.555	.530	.165	.315	.508	.669	.736
	CAUSE_12	.595	.323	.325	.316	.221	-.090	.396	.466	.522	.401
Sig. (1-tailed)	SCP3	.	.002	.001	.004	.006	.045	.010	.015	.000	.004
	CAUSE_1	.002	.	.000	.001	.000	.000	.014	.062	.022	.028
	CAUSE_2	.001	.000	.	.001	.000	.000	.013	.077	.012	.029
	CAUSE_3	.004	.001	.001	.	.000	.014	.166	.009	.003	.006
	CAUSE_4	.006	.000	.000	.000	.	.000	.086	.113	.028	.027
	CAUSE_5	.045	.000	.000	.014	.000	.	.018	.351	.157	.338
	CAUSE_6	.010	.014	.013	.166	.086	.018	.	.090	.005	.229
	CAUSE_7	.015	.062	.077	.009	.113	.351	.090	.	.003	.001
	CAUSE_8	.000	.022	.012	.003	.028	.157	.005	.003	.	.000
	CAUSE_9	.004	.028	.029	.006	.027	.338	.229	.001	.000	.
	CAUSE_10	.014	.001	.000	.006	.000	.017	.020	.023	.000	.000
	CAUSE_11	.004	.012	.020	.002	.003	.216	.063	.005	.000	.000
	CAUSE_12	.001	.058	.057	.062	.144	.335	.025	.009	.004	.023
N	SCP3	25	25	25	25	25	25	25	25	25	25
	CAUSE_1	25	25	25	25	25	25	25	25	25	25
	CAUSE_2	25	25	25	25	25	25	25	25	25	25
	CAUSE_3	25	25	25	25	25	25	25	25	25	25
	CAUSE_4	25	25	25	25	25	25	25	25	25	25
	CAUSE_5	25	25	25	25	25	25	25	25	25	25
	CAUSE_6	25	25	25	25	25	25	25	25	25	25
	CAUSE_7	25	25	25	25	25	25	25	25	25	25
	CAUSE_8	25	25	25	25	25	25	25	25	25	25
	CAUSE_9	25	25	25	25	25	25	25	25	25	25
	CAUSE_10	25	25	25	25	25	25	25	25	25	25
	CAUSE_11	25	25	25	25	25	25	25	25	25	25
	CAUSE_12	25	25	25	25	25	25	25	25	25	25

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP3	.440	.520	.595
	CAUSE_1	.617	.452	.323
	CAUSE_2	.624	.413	.325
	CAUSE_3	.500	.555	.316
	CAUSE_4	.631	.530	.221
	CAUSE_5	.424	.165	-.090
	CAUSE_6	.414	.315	.396
	CAUSE_7	.404	.508	.466
	CAUSE_8	.665	.669	.522
	CAUSE_9	.718	.736	.401
	CAUSE_10	1.000	.737	.394
	CAUSE_11	.737	1.000	.731
	CAUSE_12	.394	.731	1.000
Sig. (1-tailed)	SCP3	.014	.004	.001
	CAUSE_1	.001	.012	.058
	CAUSE_2	.000	.020	.057
	CAUSE_3	.006	.002	.062
	CAUSE_4	.000	.003	.144
	CAUSE_5	.017	.216	.335
	CAUSE_6	.020	.063	.025
	CAUSE_7	.023	.005	.009
	CAUSE_8	.000	.000	.004
	CAUSE_9	.000	.000	.023
	CAUSE_10	.	.000	.026
	CAUSE_11	.000	.	.000
	CAUSE_12	.026	.000	.
N	SCP3	25	25	25
	CAUSE_1	25	25	25
	CAUSE_2	25	25	25
	CAUSE_3	25	25	25
	CAUSE_4	25	25	25
	CAUSE_5	25	25	25
	CAUSE_6	25	25	25
	CAUSE_7	25	25	25
	CAUSE_8	25	25	25
	CAUSE_9	25	25	25
	CAUSE_10	25	25	25

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-.216	1.249		-.173	.866	-2.937	2.505			
	CAUSE_1	-.131	.354	-.180	-.370	.718	-.901	.639	.553	-.106	-.052
	CAUSE_2	.289	.410	.379	.703	.495	-.605	1.183	.603	.199	.099
	CAUSE_3	-4.011E-02	.193	-.055	-.208	.839	-.460	.380	.515	-.060	-.029
	CAUSE_4	6.363E-02	.366	.089	.174	.865	-.734	.861	.491	.050	.025
	CAUSE_5	.262	.233	.356	1.122	.284	-.247	.770	.347	.308	.158
	CAUSE_6	-4.000E-02	.179	-.055	-.223	.827	-.431	.351	.462	-.064	-.031
	CAUSE_7	2.456E-02	.185	.030	.133	.896	-.378	.427	.433	.038	.019
	CAUSE_8	.426	.266	.472	1.604	.135	-.153	1.005	.707	.420	.226
	CAUSE_9	.223	.248	.319	.898	.387	-.318	.763	.516	.251	.127
	CAUSE_10	-.324	.245	-.399	-1.324	.210	-.857	.209	.440	-.357	-.187
	CAUSE_11	-.197	.302	-.303	-.652	.527	-.856	.462	.520	-.185	-.092
	CAUSE_12	.404	.218	.573	1.849	.089	-.072	.880	.595	.471	[illegible]
2	(Constant)	-.169	1.152		-.147	.886	-2.659	2.320			
	CAUSE_1	-.121	.332	-.166	-.364	.722	-.839	.597	.553	-.100	[illegible]
	CAUSE_2	.276	.384	.363	.719	.485	-.553	1.105	.603	.196	[illegible]
	CAUSE_3	-3.193E-02	.176	-.044	-.182	.858	-.411	.347	.515	-.050	[illegible]
	CAUSE_4	7.090E-02	.348	.099	.204	.842	-.681	.523	.491	.056	[illegible]
	CAUSE_5	.250	.206	.339	1.209	.248	-.196	.695	.347	.318	[illegible]
	CAUSE_6	-3.129E-02	.160	-.043	-.195	.848	-.378	.315	.462	-.054	-.026
	CAUSE_8	.423	.254	.468	1.663	.120	-.126	.972	.707	.419	[illegible]
	CAUSE_9	.237	.216	.339	1.096	.293	-.230	.704	.516	.291	[illegible]
	CAUSE_10	-.324	.235	-.400	-1.378	.191	-.832	.184	.440	-.357	[illegible]
	CAUSE_11	-.206	.283	-.317	-.729	.479	-.818	.406	.520	-.198	-.099
	CAUSE_12	.409	.207	.580	1.978	.069	-.038	.855	.595	.481	.268
3	(Constant)	-.192	1.105		-.174	.865	-2.563	2.179			
	CAUSE_1	-.113	.318	-.156	-.357	.727	-.796	.569	.553	-.095	-.047
	CAUSE_2	.275	.370	.361	.742	.471	-.519	1.068	.603	.194	.097
	CAUSE_4	4.007E-02	.293	.056	.137	.893	-.589	.669	.491	.036	.018
	CAUSE_5	.253	.198	.344	1.276	.223	-.172	.678	.347	.323	.167
	CAUSE_6	-3.050E-02	.155	-.042	-.197	.847	-.362	.301	.462	-.053	-.026
	CAUSE_8	.411	.237	.455	1.732	.105	-.098	.920	.707	.420	.227
	CAUSE_9	.232	.207	.332	1.121	.281	-.212	.675	.516	.287	.147
	CAUSE_10	-.314	.221	-.387	-1.423	.177	-.788	.159	.440	-.355	-.186
	CAUSE_11	-.206	.273	-.317	-.755	.463	-.792	.380	.520	-.198	-.099
	CAUSE_12	.407	.199	.578	2.044	.060	-.029	.835	.595	.479	.268

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	-.164	1.049		-.156	.878	-2.400	2.073			
	CAUSE_1	-.111	.307	-.152	-.360	.724	-.765	.543	.553	-.093	-.046
	CAUSE_2	.298	.317	.392	.939	.363	-.378	.974	.603	.236	.119
	CAUSE_5	.269	.158	.365	1.704	.109	-.067	.604	.347	.403	.216
	CAUSE_6	-3.906E-02	.137	-.054	-.286	.779	-.331	.252	.462	-.074	-.036
	CAUSE_8	.413	.229	.457	1.803	.091	-.075	.901	.707	.422	.228
	CAUSE_9	.225	.194	.322	1.159	.264	-.189	.639	.516	.287	.147
	CAUSE_10	-.318	.212	-.392	-1.501	.154	-.769	.133	.440	-.361	-.190
	CAUSE_11	-.184	.214	-.284	-.860	.403	-.642	.273	.520	-.217	-.109
	CAUSE_12	.399	.183	.566	2.183	.045	.009	.788	.595	.491	.276
5	(Constant)	-.123	1.010		-.122	.904	-2.264	2.017			
	CAUSE_1	-.122	.295	-.168	-.413	.685	-.745	.504	.553	-.103	-.051
	CAUSE_2	.310	.305	.408	1.018	.324	-.336	.957	.603	.247	[illegible]
	CAUSE_5	.257	.148	.349	1.739	.101	-.056	.570	.347	.399	[illegible]
	CAUSE_8	.383	.197	.423	1.943	.070	-.035	.800	.707	.437	[illegible]
	CAUSE_9	.243	.179	.347	1.356	.194	-.137	.622	.516	.321	[illegible]
	CAUSE_10	-.332	.200	-.409	-1.655	.117	-.756	.093	.440	-.382	[illegible]
	CAUSE_11	-.172	.204	-.265	-.844	.411	-.604	.260	.520	-.206	[illegible]
	CAUSE_12	.382	.169	.543	2.269	.037	.025	.740	.595	.493	[illegible]
6	(Constant)	-.136	.984		-.138	.892	-2.213	1.940			
	CAUSE_2	.202	.151	.265	1.337	.199	-.117	.520	.603	.308	[illegible]
	CAUSE_5	.239	.138	.325	1.735	.101	-.052	.530	.347	.388	[illegible]
	CAUSE_8	.403	.186	.446	2.169	.045	.011	.795	.707	.466	[illegible]
	CAUSE_9	.234	.173	.335	1.350	.195	-.132	.599	.516	.311	[illegible]
	CAUSE_10	-.327	.195	-.403	-1.675	.112	-.738	.085	.440	-.376	-.201
	CAUSE_11	-.185	.197	-.284	-.940	.360	-.599	.230	.520	-.222	-.113
	CAUSE_12	.379	.164	.538	2.309	.034	.033	.726	.595	.489	.277
7	(Constant)	.264	.885		.298	.769	-1.595	2.122			
	CAUSE_2	.248	.142	.326	1.742	.099	-.051	.547	.603	.380	.208
	CAUSE_5	.200	.131	.271	1.525	.145	-.075	.475	.347	.338	.182
	CAUSE_8	.429	.183	.475	2.344	.031	.044	.814	.707	.484	.280
	CAUSE_9	.154	.151	.220	1.023	.320	-.162	.470	.516	.234	.122
	CAUSE_10	-.406	.175	-.500	-2.312	.033	-.774	-.037	.440	-.479	-.276
	CAUSE_12	.264	.109	.375	2.418	.026	.035	.493	.595	.495	.289

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.872[a]	.761	.522	1.1508	.761	3.187	12	12	.028
2	.872[b]	.761	.558	1.1065	.000	.018	1	14	.896
3	.872[c]	.760	.589	1.0676	-.001	.033	1	15	.858
4	.872[d]	.760	.616	1.0321	.000	.019	1	16	.893
5	.871[e]	.759	.638	1.0020	-.001	.082	1	17	.779
6	.869[f]	.756	.656	.9773	-.003	.171	1	18	.685
7	.862[g]	.743	.658	.9741	-.013	.884	1	19	.360
8	.853[h]	.728	.657	.9753	-.015	1.047	1	20	.320
9	.840[i]	.706	.647	.9897	-.023	1.592	1	21	.222

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
d. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
e. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
f. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11
g. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8
h. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_2, CAUSE_10, CAUSE_8
i. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_8
j. Dependent Variable: SCP3

ANOVA[j]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.648	12	4.221	3.187	.028[a]
	Residual	15.892	12	1.324		
	Total	66.540	24			
2	Regression	50.624	11	4.602	3.759	.013[b]
	Residual	15.916	13	1.224		
	Total	66.540	24			
3	Regression	50.584	10	5.058	4.438	.006[c]
	Residual	15.956	14	1.140		
	Total	66.540	24			
4	Regression	50.562	9	5.618	5.274	.002[d]
	Residual	15.978	15	1.065		
	Total	66.540	24			
5	Regression	50.476	8	6.309	6.284	.001[e]
	Residual	16.064	16	1.004		
	Total	66.540	24			
6	Regression	50.304	7	7.186	7.524	.000[f]
	Residual	16.236	17	.955		
	Total	66.540	24			
7	Regression	49.460	6	8.243	8.687	.000[g]
	Residual	17.080	18	.949		
	Total	66.540	24			
8	Regression	48.466	5	9.693	10.190	.000[h]
	Residual	18.074	19	.951		
	Total	66.540	24			
9	Regression	46.951	4	11.738	11.984	.000[i]
	Residual	19.589	20	.979		
	Total	66.540	24			

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
d. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
e. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
f. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11
g. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_2, CAUSE_10, CAUSE_8
h. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_2, CAUSE_10, CAUSE_8
i. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_8
j. Dependent Variable: SCP3

Analysis for Ca-SCP3-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.090	11.134
	CAUSE_2	.092	10.863
	CAUSE_5	.349	2.866
	CAUSE_6	.450	2.222
	CAUSE_8	.249	4.012
	CAUSE_9	.207	4.822
	CAUSE_10	.235	4.259
	CAUSE_11	.147	6.797
	CAUSE_12	.238	4.194
5	(Constant)		
	CAUSE_1	.091	10.942
	CAUSE_2	.094	10.653
	CAUSE_5	.375	2.670
	CAUSE_8	.318	3.147
	CAUSE_9	.230	4.341
	CAUSE_10	.247	4.043
	CAUSE_11	.153	6.516
	CAUSE_12	.264	3.792
6	(Constant)		
	CAUSE_2	.365	2.743
	CAUSE_5	.409	2.448
	CAUSE_8	.339	2.946
	CAUSE_9	.234	4.280
	CAUSE_10	.248	4.030
	CAUSE_11	.157	6.366
	CAUSE_12	.264	3.783
7	(Constant)		
	CAUSE_2	.408	2.454
	CAUSE_5	.450	2.220
	CAUSE_8	.347	2.881
	CAUSE_9	.307	3.254
	CAUSE_10	.305	3.283
	CAUSE_12	.594	1.684

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	.221	.885		.250	.806	-1.631	2.073			
	CAUSE_2	.254	.142	.333	1.782	.091	-.044	.552	.603	.378	.213
	CAUSE_5	.157	.124	.213	1.262	.222	-.103	.416	.347	.278	.151
	CAUSE_8	.527	.156	.584	3.375	.003	.200	.854	.707	.612	.404
	CAUSE_10	-.313	.150	-.386	-2.080	.051	-.628	.002	.440	-.431	-.249
	CAUSE_12	.249	.108	.354	2.300	.033	.022	.476	.595	.467	.275
9	(Constant)	.700	.811		.863	.398	-.991	2.392			
	CAUSE_2	.356	.119	.468	2.994	.007	.108	.604	.603	.556	.363
	CAUSE_8	.527	.159	.583	3.323	.003	.196	.857	.707	.596	.403
	CAUSE_10	-.283	.151	-.349	-1.876	.075	-.597	.032	.440	-.387	-.228
	CAUSE_12	.195	.101	.277	1.932	.068	-.016	.405	.595	.397	.234

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.408	2.450
	CAUSE_5	.502	1.991
	CAUSE_8	.478	2.091
	CAUSE_10	.416	2.406
	CAUSE_12	.604	1.654
9	(Constant)		
	CAUSE_2	.603	1.658
	CAUSE_8	.478	2.091
	CAUSE_10	.426	2.345
	CAUSE_12	.718	1.393

a. Dependent Variable: SCP3

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.084	11.893
	CAUSE_2	.068	14.614
	CAUSE_3	.283	3.532
	CAUSE_4	.076	13.197
	CAUSE_5	.198	5.056
	CAUSE_6	.326	3.070
	CAUSE_7	.390	2.561
	CAUSE_8	.230	4.342
	CAUSE_9	.158	6.328
	CAUSE_10	.219	4.569
	CAUSE_11	.092	10.874
	CAUSE_12	.207	4.827
2	(Constant)		
	CAUSE_1	.088	11.357
	CAUSE_2	.072	13.825
	CAUSE_3	.315	3.172
	CAUSE_4	.078	12.903
	CAUSE_5	.234	4.280
	CAUSE_6	.376	2.660
	CAUSE_8	.233	4.300
	CAUSE_9	.193	5.194
	CAUSE_10	.219	4.569
	CAUSE_11	.097	10.315
	CAUSE_12	.214	4.675
3	(Constant)		
	CAUSE_1	.089	11.183
	CAUSE_2	.072	13.819
	CAUSE_4	.102	9.841
	CAUSE_5	.236	4.243
	CAUSE_6	.376	2.658
	CAUSE_8	.248	4.027
	CAUSE_9	.196	5.110
	CAUSE_10	.231	4.326
	CAUSE_11	.097	10.315
	CAUSE_12	[illegible]	[illegible]

SPSS regression printouts for SCP4 analysis

Descriptive Statistics

	Mean	Std. Deviation	N
SCP4	5.719	1.5069	197
CAUSE1	6.127	1.9895	197
CAUSE2	5.561	1.9882	197
CAUSE3	5.660	1.9990	197
CAUSE4	5.652	2.0227	197
CAUSE5	5.510	1.9961	197
CAUSE6	5.117	1.9382	197
CAUSE7	5.272	2.0225	197
CAUSE8	6.170	1.9180	197
CAUSE9	6.297	2.1776	197
CAUSE10	5.939	1.7667	197
CAUSE11	5.338	2.0087	197
CAUSE12	5.599	1.9637	197

Correlations

		SCP4	CAUSE1	CAUSE2	CAUSE3	CAUSE4	CAUSE5	CAUSE6	CAUSE7	CAUSE8	CAUSE9
Pearson Correlation	SCP4	1.000	.291	.309	.339	.314	.283	.213	.358	.330	.350
	CAUSE1	.291	1.000	.758	.558	.554	.537	.500	.399	.465	.414
	CAUSE2	.309	.758	1.000	.624	.693	.583	.466	.419	.439	.337
	CAUSE3	.339	.558	.624	1.000	.641	.583	.468	.469	.372	.365
	CAUSE4	.314	.554	.693	.641	1.000	.732	.453	.425	.383	.306
	CAUSE5	.283	.537	.583	.583	.732	1.000	.554	.314	.368	.225
	CAUSE6	.213	.500	.466	.468	.453	.554	1.000	.501	.442	.361
	CAUSE7	.358	.399	.419	.469	.425	.314	.501	1.000	.566	.472
	CAUSE8	.330	.465	.439	.372	.383	.368	.442	.566	1.000	.634
	CAUSE9	.350	.414	.337	.365	.306	.225	.361	.472	.634	1.000
	CAUSE10	.265	.307	.351	.334	.478	.432	.287	.276	.448	.412
	CAUSE11	.345	.354	.397	.356	.431	.324	.288	.487	.644	.636
	CAUSE12	.190	.254	.139	.189	.159	.144	.294	.261	.405	.348
Sig. (1-tailed)	SCP4	.	.000	.000	.000	.000	.000	.001	.000	.000	.000
	CAUSE1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE5	.000	.000	.000	.000	.000	.	.000	.000	.000	.001
	CAUSE6	.001	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE9	.000	.000	.000	.000	.000	.001	.000	.000	.000	.
	CAUSE10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE12	.004	.000	.025	.004	.013	.022	.000	.000	.000	.000
N	SCP4	197	197	197	197	197	197	197	197	197	197
	CAUSE1	197	197	197	197	197	197	197	197	197	197
	CAUSE2	197	197	197	197	197	197	197	197	197	197
	CAUSE3	197	197	197	197	197	197	197	197	197	197
	CAUSE4	197	197	197	197	197	197	197	197	197	197
	CAUSE5	197	197	197	197	197	197	197	197	197	197
	CAUSE6	197	197	197	197	197	197	197	197	197	197
	CAUSE7	197	197	197	197	197	197	197	197	197	197
	CAUSE8	197	197	197	197	197	197	197	197	197	197
	CAUSE9	197	197	197	197	197	197	197	197	197	197
	CAUSE10	197	197	197	197	197	197	197	197	197	197

Correlations

		CAUSE10	CAUSE11	CAUSE12
Pearson Correlation	SCP4	.265	.345	.190
	CAUSE1	.307	.354	.254
	CAUSE2	.351	.397	.139
	CAUSE3	.334	.356	.189
	CAUSE4	.478	.431	.159
	CAUSE5	.432	.324	.144
	CAUSE6	.287	.288	.294
	CAUSE7	.276	.487	.261
	CAUSE8	.448	.644	.405
	CAUSE9	.412	.636	.348
	CAUSE10	1.000	.582	.393
	CAUSE11	.582	1.000	.457
	CAUSE12	.393	.457	1.000
Sig. (1-tailed)	SCP4	.000	.000	.004
	CAUSE1	.000	.000	.000
	CAUSE2	.000	.000	.025
	CAUSE3	.000	.000	.004
	CAUSE4	.000	.000	.013
	CAUSE5	.000	.000	.022
	CAUSE6	.000	.000	.000
	CAUSE7	.000	.000	.000
	CAUSE8	.000	.000	.000
	CAUSE9	.000	.000	.000
	CAUSE10	.	.000	.000
	CAUSE11	.000	.	.000
	CAUSE12	.000	.000	.
N	SCP4	197	197	197
	CAUSE1	197	197	197
	CAUSE2	197	197	197
	CAUSE3	197	197	197
	CAUSE4	197	197	197
	CAUSE5	197	197	197
	CAUSE6	197	197	197
	CAUSE7	197	197	197
	CAUSE8	197	197	197
	CAUSE9	197	197	197
	CAUSE10	197	197	197
	CAUSE11	197	197	197
	CAUSE12	197	197	197

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4[a]	.	Enter
2	.	CAUSE4	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE1	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE8	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE10	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE12	Backward (criterion: Probability of F-to-remove >= .100).

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	97.550	9	10.839	5.832	.000[d]
	Residual	347.530	187	1.858		
	Total	445.081	196			
5	Regression	97.369	8	12.171	6.581	.000[e]
	Residual	347.711	188	1.850		
	Total	445.081	196			
6	Regression	96.675	7	13.811	7.492	.000[f]
	Residual	348.406	189	1.843		
	Total	445.081	196			
7	Regression	96.033	6	16.006	8.712	.000[g]
	Residual	349.047	190	1.837		
	Total	445.081	196			
8	Regression	94.276	5	18.855	10.266	.000[h]
	Residual	350.805	191	1.837		
	Total	445.081	196			
9	Regression	90.933	4	22.733	12.325	.000[i]
	Residual	354.147	192	1.845		
	Total	445.081	196			
10	Regression	87.491	3	29.164	15.740	.000[j]
	Residual	357.589	193	1.853		
	Total	445.081	196			

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1
c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11
d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
f. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
g. Predictors: (Constant), CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
h. Predictors: (Constant), CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5
i. Predictors: (Constant), CAUSE9, CAUSE7, CAUSE3, CAUSE5
j. Predictors: (Constant), CAUSE9, CAUSE7, CAUSE5
k. Dependent Variable: SCP4

7	.	CAUSE2	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE11	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE6	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE3	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP4

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	3.022	.451		6.706	.000	2.133	3.911			
	CAUSE1	5.056E-03	.083	.007	.061	.951	-.158	.168	.291	.005	.004
	CAUSE2	4.145E-02	.091	.055	.455	.650	-.138	.221	.309	.034	.030
	CAUSE3	7.881E-02	.072	.105	1.091	.277	-.064	.221	.339	.080	.071
	CAUSE4	-1.839E-03	.088	-.002	-.021	.983	-.175	.171	.314	-.002	-.001
	CAUSE5	9.485E-02	.083	.126	1.146	.253	-.068	.258	.283	.084	.075
	CAUSE6	-9.336E-02	.071	-.120	-1.317	.189	-.233	.046	.213	-.097	-.086
	CAUSE7	.138	.068	.185	2.038	.043	.004	.271	.358	.149	.133
	CAUSE8	4.899E-03	.080	.006	.061	.951	-.153	.163	.330	.004	.004
	CAUSE9	.110	.066	.159	1.656	.099	-.021	.241	.350	.121	.108
	CAUSE10	2.332E-02	.075	.027	.310	.757	-.125	.172	.265	.023	.020
	CAUSE11	3.660E-02	.080	.049	.456	.649	-.122	.195	.345	.034	.030
	CAUSE12	3.051E-02	.061	.040	.504	.615	-.089	.150	.190	.037	.033
2	(Constant)	3.022	.449		6.724	.000	2.135	3.909			
	CAUSE1	5.133E-03	.082	.007	.062	.950	-.157	.167	.291	.005	.004
	CAUSE2	4.084E-02	.086	.054	.474	.636	-.129	.211	.309	.035	.031
	CAUSE3	7.852E-02	.071	.104	1.110	.268	-.061	.218	.339	.081	.072
	CAUSE5	9.407E-02	.074	.125	1.277	.203	-.051	.239	.283	.093	.083
	CAUSE6	-9.327E-02	.071	-.120	-1.322	.188	-.232	.046	.213	-.097	-.086
	CAUSE7	.138	.067	.185	2.062	.041	.006	.269	.358	.150	.134
	CAUSE8	5.072E-03	.080	.006	.064	.949	-.152	.162	.330	.005	.004
	CAUSE9	.110	.066	.159	1.661	.098	-.021	.241	.350	.121	.108
	CAUSE10	2.303E-02	.074	.027	.312	.756	-.123	.169	.265	.023	.020
	CAUSE11	3.644E-02	.080	.049	.457	.648	-.121	.194	.345	.034	.030
	CAUSE12	3.057E-02	.060	.040	.507	.613	-.089	.150	.190	.037	.033
3	(Constant)	3.025	.446		6.786	.000	2.145	3.904			
	CAUSE2	4.396E-02	.070	.058	.628	.531	-.094	.182	.309	.046	.041
	CAUSE3	7.875E-02	.070	.104	1.118	.265	-.060	.218	.339	.082	.072
	CAUSE5	9.462E-02	.073	.125	1.297	.196	-.049	.238	.283	.095	.084
	CAUSE6	-9.289E-02	.070	-.119	-1.325	.187	-.231	.045	.213	-.097	-.086
	CAUSE7	.138	.067	.185	2.067	.040	.006	.269	.358	.150	.134
	CAUSE8	5.469E-03	.079	.007	.069	.945	-.151	.162	.330	.005	.004
	CAUSE9	.111	.065	.160	1.708	.089	-.017	.239	.350	.124	.111
	CAUSE10	2.268E-02	.073	.027	.309	.758	-.122	.168	.265	.023	.020
	CAUSE11	3.583E-02	.079	.048	.454	.650	-.120	.191	.345	.033	.029
	CAUSE12	3.121E-02	.059	.041	.526	.600	-.086	.148	.190	.039	.034

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.468[a]	.219	.168	1.3743	.219	4.305	12	184	.000
2	.468[b]	.219	.173	1.3706	.000	.000	1	186	.983
3	.468[c]	.219	.177	1.3669	.000	.004	1	187	.950
4	.468[d]	.219	.182	1.3632	.000	.005	1	188	.945
5	.468[e]	.219	.186	1.3600	.000	.098	1	189	.755
6	.466[f]	.217	.188	1.3577	-.002	.375	1	190	.541
7	.465[g]	.216	.191	1.3554	-.001	.348	1	191	.556
8	.460[h]	.212	.191	1.3552	-.004	.957	1	192	.329
9	.452[i]	.204	.188	1.3581	-.008	1.820	1	193	.179
10	.443[j]	.197	.184	1.3612	-.008	1.866	1	194	.174

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1
c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11
d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
f. Predictors: (Constant), CAUSE2, CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
g. Predictors: (Constant), CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE11
h. Predictors: (Constant), CAUSE9, CAUSE6, CAUSE7, CAUSE3, CAUSE5
i. Predictors: (Constant), CAUSE9, CAUSE7, CAUSE3, CAUSE5
j. Predictors: (Constant), CAUSE9, CAUSE7, CAUSE5
k. Dependent Variable: SCP4

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.567	12	8.131	4.305	.000[a]
	Residual	347.513	184	1.889		
	Total	445.081	196			
2	Regression	97.567	11	8.870	4.722	.000[b]
	Residual	347.514	185	1.878		
	Total	445.081	196			
3	Regression	97.559	10	9.756	5.222	.000[c]
	Residual	347.521	186	1.868		
	Total	445.081	196			

Analysis for Ca-SCP4-AR

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	CAUSE1	.357	2.801
	CAUSE2	.294	3.403
	CAUSE3	.462	2.163
	CAUSE4	.307	3.258
	CAUSE5	.353	2.833
	CAUSE6	.511	1.958
	CAUSE7	.515	1.942
	CAUSE8	.407	2.459
	CAUSE9	.460	2.176
	CAUSE10	.545	1.836
	CAUSE11	.370	2.700
	CAUSE12	.681	1.469
2	(Constant)		
	CAUSE1	.358	2.796
	CAUSE2	.327	3.058
	CAUSE3	.480	2.085
	CAUSE5	.443	2.256
	CAUSE6	.513	1.950
	CAUSE7	.526	1.901
	CAUSE8	.411	2.433
	CAUSE9	.460	2.175
	CAUSE10	.563	1.778
	CAUSE11	.374	2.674
	CAUSE12	.682	1.466
3	(Constant)		
	CAUSE2	.493	2.030
	CAUSE3	.481	2.079
	CAUSE5	.450	2.223
	CAUSE6	.517	1.936
	CAUSE7	.526	1.900
	CAUSE8	.414	2.418
	CAUSE9	.477	2.098
	CAUSE10	.566	1.767
	CAUSE11	.380	2.634
	CAUSE12	.702	1.424

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE2	.500	1.998
	CAUSE3	.487	2.053
	CAUSE5	.453	2.206
	CAUSE6	.520	1.924
	CAUSE7	.561	1.782
	CAUSE9	.527	1.897
	CAUSE10	.567	1.765
	CAUSE11	.400	2.501
	CAUSE12	.714	1.401
5	(Constant)		
	CAUSE2	.501	1.998
	CAUSE3	.487	2.053
	CAUSE5	.487	2.055
	CAUSE6	.521	1.921
	CAUSE7	.565	1.770
	CAUSE9	.530	1.887
	CAUSE11	.452	2.213
	CAUSE12	.740	1.351
6	(Constant)		
	CAUSE2	.506	1.974
	CAUSE3	.488	2.049
	CAUSE5	.489	2.043
	CAUSE6	.547	1.827
	CAUSE7	.566	1.767
	CAUSE9	.531	1.885
	CAUSE11	.513	1.950
7	(Constant)		
	CAUSE3	.553	1.808
	CAUSE5	.527	1.897
	CAUSE6	.551	1.815
	CAUSE7	.569	1.758
	CAUSE9	.531	1.884
	CAUSE11	.521	1.920

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
4	(Constant)	3.029	.441		6.862	.000	2.158	3.899			
	CAUSE2	4.455E-02	.069	.059	.644	.521	-.092	.181	.309	.047	.042
	CAUSE3	7.821E-02	.070	.104	1.121	.264	-.059	.216	.339	.082	.072
	CAUSE5	9.507E-02	.072	.126	1.312	.191	-.048	.238	.283	.096	.085
	CAUSE6	-9.251E-02	.070	-.119	-1.328	.186	-.230	.045	.213	-.097	-.086
	CAUSE7	.139	.064	.186	2.157	.032	.012	.265	.358	.156	.139
	CAUSE9	.112	.062	.162	1.824	.070	-.009	.234	.350	.132	.118
	CAUSE10	2.286E-02	.073	.027	.312	.755	-.122	.167	.265	.023	.020
	CAUSE11	3.705E-02	.077	.049	.483	.629	-.114	.188	.345	.035	.031
	CAUSE12	3.173E-02	.059	.041	.541	.589	-.084	.148	.190	.039	.035
5	(Constant)	3.070	.420		7.314	.000	2.242	3.898			
	CAUSE2	4.499E-02	.069	.059	.652	.515	-.091	.181	.309	.047	.042
	CAUSE3	7.830E-02	.070	.104	1.124	.262	-.059	.216	.339	.082	.072
	CAUSE5	.101	.070	.134	1.447	.149	-.037	.239	.283	.105	.093
	CAUSE6	-9.329E-02	.069	-.120	-1.343	.181	-.230	.044	.213	-.097	-.087
	CAUSE7	.137	.064	.184	2.144	.033	.011	.263	.358	.154	.138
	CAUSE9	.114	.061	.164	1.855	.065	-.007	.235	.350	.134	.120
	CAUSE11	4.517E-02	.072	.060	.628	.531	-.097	.187	.345	.046	.040
	CAUSE12	3.522E-02	.057	.046	.613	.541	-.078	.149	.190	.045	.039
6	(Constant)	3.171	.385		8.231	.000	2.411	3.931			
	CAUSE2	4.043E-02	.069	.053	.590	.556	-.095	.176	.309	.043	.038
	CAUSE3	8.007E-02	.069	.106	1.153	.250	-.057	.217	.339	.084	.074
	CAUSE5	9.773E-02	.069	.129	1.407	.161	-.039	.235	.283	.102	.091
	CAUSE6	-8.386E-02	.068	-.108	-1.240	.217	-.217	.050	.213	-.090	-.080
	CAUSE7	.135	.064	.182	2.125	.035	.010	.261	.358	.153	.137
	CAUSE9	.115	.061	.166	1.880	.062	-.006	.236	.350	.136	.121
	CAUSE11	6.037E-02	.067	.080	.895	.372	-.073	.193	.345	.065	.058
7	(Constant)	3.197	.382		8.365	.000	2.443	3.951			
	CAUSE3	9.412E-02	.065	.125	1.445	.150	-.034	.223	.339	.104	.093
	CAUSE5	.109	.067	.144	1.627	.105	-.023	.240	.283	.117	.105
	CAUSE6	-8.058E-02	.067	-.104	-1.198	.233	-.213	.052	.213	-.087	-.077
	CAUSE7	.138	.063	.185	2.175	.031	.013	.263	.358	.156	.140
	CAUSE9	.115	.061	.167	1.889	.060	-.005	.236	.350	.136	.121
	CAUSE11	6.532E-02	.067	.087	.978	.329	-.066	.197	.345	.071	.063

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
8	(Constant)	3.237	.380		8.520	.000	2.488	3.986			
	CAUSE3	9.351E-02	.065	.124	1.436	.153	-.035	.222	.339	.103	.092
	CAUSE5	.122	.065	.162	1.876	.062	-.006	.251	.283	.135	.121
	CAUSE6	-8.985E-02	.067	-.116	-1.349	.179	-.221	.042	.213	-.097	-.087
	CAUSE7	.154	.061	.207	2.511	.013	.033	.275	.358	.179	.161
	CAUSE9	.147	.052	.212	2.841	.005	.045	.249	.350	.201	.183
9	(Constant)	3.188	.379		8.412	.000	2.441	3.936			
	CAUSE3	8.903E-02	.065	.118	1.366	.174	-.040	.218	.339	.098	.088
	CAUSE5	8.709E-02	.060	.115	1.454	.148	-.031	.205	.283	.104	.094
	CAUSE7	.125	.058	.172	2.196	.029	.013	.244	.358	.157	.141
	CAUSE9	.138	.051	.200	2.687	.008	.037	.240	.350	.190	.173
10	(Constant)	3.271	.375		8.720	.000	2.531	4.010			
	CAUSE5	.129	.052	.171	2.507	.013	.028	.231	.283	.178	[illegible]
	CAUSE7	.151	.056	.202	2.684	.008	.040	.262	.358	.190	[illegible]
	CAUSE9	.149	.051	.216	2.939	.004	.049	.250	.350	.207	.190

						CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
	[illegible]	1.000	.309	.374	.503	.352	.457	.067	.377	.324	.348
	CAUSE_1	.309	1.000	.850	.628	.625	.540	.224	.433	.436	.416
	CAUSE_2	.374	.850	1.000	.622	.759	.595	.164	.564	.530	.543
	CAUSE_3	.503	.628	.622	1.000	.598	.633	.211	.426	.379	.350
	CAUSE_4	.352	.625	.759	.598	1.000	.785	.285	.548	.447	.549
	CAUSE_5	.457	.540	.595	.633	.785	1.000	.274	.378	.389	.396
	CAUSE_6	.067	.224	.164	.211	.285	.274	1.000	.282	.234	.159
	CAUSE_7	.377	.433	.564	.426	.548	.378	.282	1.000	.694	.552
	CAUSE_8	.324	.436	.530	.379	.447	.389	.234	.694	1.000	.784
	CAUSE_9	.348	.416	.543	.350	.549	.396	.159	.552	.784	1.000
	CAUSE_10	.248	.253	.309	.185	.359	.327	.086	.393	.664	.694
	CAUSE_11	.285	.341	.456	.217	.400	.340	.044	.524	.797	.760
	CAUSE_12	.006	.248	.108	.092	.088	.168	.099	.110	.396	.372
Sig. (1-tailed)	SCP4	.	.011	.002	.000	.004	.000	.313	.002	.008	.005
	CAUSE_1	.011	.	.000	.000	.000	.000	.050	.000	.000	.001
	CAUSE_2	.002	.000	.	.000	.000	.000	.116	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.061	.001	.002	.004
	CAUSE_4	.004	.000	.000	.000	.	.000	.017	.000	.000	.000
	CAUSE_5	.000	.000	.000	.000	.000	.	.022	.002	.002	.001
	CAUSE_6	.313	.050	.116	.061	.017	.022	.	.019	.043	.123
	CAUSE_7	.002	.000	.000	.001	.000	.002	.019	.	.000	.000
	CAUSE_8	.003	.000	.000	.002	.000	.002	.043	.000	.	.000
	CAUSE_9	.005	.001	.000	.004	.000	.001	.123	.000	.000	.
	CAUSE_10	.034	.031	.011	.088	.004	.007	.267	.001	.000	.000
	CAUSE_11	.017	.005	.000	.056	.001	.006	.375	.000	.000	.000
	CAUSE_12	.483	.034	.217	.251	.263	.110	.236	.212	.001	.003
N	SCP4	55	55	55	55	55	55	55	55	55	55
	CAUSE_1	55	55	55	55	55	55	55	55	55	55
	CAUSE_2	55	55	55	55	55	55	55	55	55	55
	CAUSE_3	55	55	55	55	55	55	55	55	55	55
	CAUSE_4	55	55	55	55	55	55	55	55	55	55
	CAUSE_5	55	55	55	55	55	55	55	55	55	55
	CAUSE_6	55	55	55	55	55	55	55	55	55	55
	CAUSE_7	55	55	55	55	55	55	55	55	55	55
	CAUSE_8	55	55	55	55	55	55	55	55	55	55
	CAUSE_9	55	55	55	55	55	55	55	55	55	55
	CAUSE_10	55	55	55	55	55	55	55	55	55	55
	CAUSE_11	55	55	55	55	55	55	55	55	55	55
	CAUSE_12	55	55	55	55	55	55	55	55	55	55

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP4	.248	.285	.006
	CAUSE_1	.253	.341	.248
	CAUSE_2	.309	.456	.108
	CAUSE_3	.185	.217	.092
	CAUSE_4	.359	.400	.088
	CAUSE_5	.327	.340	.168
	CAUSE_6	.086	.044	.099
	CAUSE_7	.393	.524	.110
	CAUSE_8	.664	.797	.396
	CAUSE_9	.694	.760	.372
	CAUSE_10	1.000	.724	.544
	CAUSE_11	.724	1.000	.370
	CAUSE_12	.544	.370	1.000
Sig. (1-tailed)	SCP4	.034	.017	.483
	CAUSE_1	.031	.005	.034
	CAUSE_2	.011	.000	.217
	CAUSE_3	.088	.056	.251
	CAUSE_4	.004	.001	.263
	CAUSE_5	.007	.006	.110
	CAUSE_6	.267	.375	.236
	CAUSE_7	.001	.000	.212
	CAUSE_8	.000	.000	.001
	CAUSE_9	.000	.000	.003
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.003
	CAUSE_12	.000	.003	.
N	SCP4	55	55	55
	CAUSE_1	55	55	55
	CAUSE_2	55	55	55
	CAUSE_3	55	55	55
	CAUSE_4	55	55	55
	CAUSE_5	55	55	55
	CAUSE_6	55	55	55
	CAUSE_7	55	55	55
	CAUSE_8	55	55	55
	CAUSE_9	55	55	55
	CAUSE_10	55	55	55
	CAUSE_11	55	55	55
	CAUSE_12	55	55	55

Analysis for Ca-SCP4-MC

		Collinearity Statistics	
Model		Tolerance	VIF
8	(Constant)		
	CAUSE3	.553	1.808
	CAUSE5	.552	1.812
	CAUSE6	.562	1.778
	CAUSE7	.609	1.642
	CAUSE9	.739	1.354
9	(Constant)		
	CAUSE3	.555	1.803
	CAUSE5	.658	1.520
	CAUSE7	.674	1.485
	CAUSE9	.750	1.332
10	(Constant)		
	CAUSE5	.894	1.118
	CAUSE7	.732	1.367
	CAUSE9	.771	1.293

a. Dependent Variable: SCP4

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP4	5.456	1.6110	55
CAUSE_1	5.391	2.2396	55
CAUSE_2	5.464	2.1897	55
CAUSE_3	5.400	2.2307	55
CAUSE_4	5.764	2.4092	55
CAUSE_5	5.500	2.2812	55
CAUSE_6	5.655	9.0615	55
CAUSE_7	4.600	2.4578	55
CAUSE_8	5.482	2.2770	55
CAUSE_9	4.809	2.1398	55
CAUSE_10	6.400	1.9940	55
CAUSE_11	4.891	2.3935	55
CAUSE_12	5.245	2.2564	55

Analysis for Ca-SCP4-MC

Model Summary[m]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.623[a]	.389	.214	1.4282	.389	2.226	12	42	.028
2	.623[b]	.389	.232	1.4118	.000	.013	1	44	.909
3	.623[c]	.388	.249	1.3961	.000	.028	1	45	.867
4	.623[d]	.388	.265	1.3809	.000	.018	1	46	.894
5	.619[e]	.383	.276	1.3709	-.005	.347	1	47	.559
6	.613[f]	.376	.283	1.3640	-.007	.525	1	48	.472
7	.609[g]	.370	.292	1.3559	-.006	.431	1	49	.515
8	.594[h]	.352	.286	1.3609	-.018	1.368	1	50	.248
9	.571[i]	.326	.272	1.3748	-.027	2.024	1	51	.161
10	.553[j]	.306	.265	1.3811	-.020	1.466	1	52	.232
11	.536[k]	.287	.259	1.3864	-.019	1.404	1	53	.241
12	.503[l]	.253	.239	1.4055	-.034	2.467	1	54	.122

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8
e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8
f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_5, CAUSE_9, CAUSE_8
g. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_5, CAUSE_9
h. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_5, CAUSE_9
i. Predictors: (Constant), CAUSE_4, CAUSE_3, CAUSE_5, CAUSE_9
j. Predictors: (Constant), CAUSE_3, CAUSE_5, CAUSE_9
k. Predictors: (Constant), CAUSE_3, CAUSE_9
l. Predictors: (Constant), CAUSE_3
m. Dependent Variable: SCP4

ANOVA[m]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.481	12	4.540	2.226	.028[a]
	Residual	85.674	42	2.040		
	Total	140.155	54			

ANOVA[m]

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	54.455	11	4.950	2.484	.016[b]
	Residual	85.701	43	1.993		
	Total	140.155	54			
3	Regression	54.398	10	5.440	2.791	.009[c]
	Residual	85.757	44	1.949		
	Total	140.155	54			
4	Regression	54.363	9	6.040	3.168	.005[d]
	Residual	85.792	45	1.906		
	Total	140.155	54			
5	Regression	53.702	8	6.713	3.572	.003[e]
	Residual	86.453	46	1.879		
	Total	140.155	54			
6	Regression	52.716	7	7.531	4.048	.002[f]
	Residual	87.439	47	1.860		
	Total	140.155	54			
7	Regression	51.914	6	8.652	4.707	.001[g]
	Residual	88.242	48	1.838		
	Total	140.155	54			
8	Regression	49.400	5	9.880	5.334	.001[h]
	Residual	90.756	49	1.852		
	Total	140.155	54			
9	Regression	45.650	4	11.413	6.038	.000[i]
	Residual	94.505	50	1.890		
	Total	140.155	54			
10	Regression	42.879	3	14.293	7.494	.000[j]
	Residual	97.276	51	1.907		
	Total	140.155	54			
11	Regression	40.200	2	20.100	10.457	.000[k]
	Residual	99.955	52	1.922		
	Total	140.155	54			
12	Regression	35.459	1	35.459	17.950	.000[l]
	Residual	104.697	53	1.975		
	Total	140.155	54			

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2
c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

Analysis for Ca-SCP4-MC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2[a]	.	Enter
2	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
12	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP4

Analysis for Ca-SCP4-MC
Analysis for Ca-SCP4-MC

Model		B	Std. Error	Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
4	(Constant)	3.057	.753		4.058	.000	1.539	4.574			
	CAUSE_3	.250	.115	.346	2.165	.036	.017	.482	.503	.307	.253
	CAUSE_4	-.283	.156	-.423	-1.816	.076	-.597	.031	.352	-.261	-.212
	CAUSE_5	.313	.149	.443	2.100	.041	.013	.613	.457	.299	.245
	CAUSE_6	-1.313E-02	.022	-.074	-.589	.559	-.058	.032	.067	-.087	-.069
	CAUSE_7	.169	.121	.258	1.392	.171	-.075	.413	.377	.203	.162
	CAUSE_8	-.125	.171	-.176	-.729	.469	-.469	.220	.324	-.108	-.085
	CAUSE_9	.207	.168	.276	1.238	.222	-.130	.545	.348	.181	.144
	CAUSE_10	9.894E-02	.152	.122	.651	.518	-.207	.405	.248	.097	.076
	CAUSE_12	-.131	.103	-.184	-1.269	.211	-.340	.077	.006	-.186	-.148
5	(Constant)	3.076	.747		4.116	.000	1.572	4.580			
	CAUSE_3	.252	.115	.348	2.197	.033	.021	.482	.503	.308	[illegible]
	CAUSE_4	-.291	.154	-.435	-1.884	.066	-.601	.020	.352	-.268	[illegible]
	CAUSE_5	.306	.148	.434	2.076	.043	.009	.603	.457	.293	[illegible]
	CAUSE_7	.161	.120	.246	1.346	.185	-.080	.402	.377	.195	[illegible]
	CAUSE_8	-.134	.169	-.189	-.791	.433	-.474	.207	.324	-.116	[illegible]
	CAUSE_9	.214	.166	.284	1.288	.204	-.120	.548	.348	.187	[illegible]
	CAUSE_10	.109	.150	.134	.724	.472	-.193	.410	.248	.106	[illegible]
	CAUSE_12	-.137	.102	-.192	-1.342	.186	-.343	.069	.006	-.194	[illegible]
6	(Constant)	3.319	.665		4.991	.000	1.981	4.655			
	CAUSE_3	.237	.112	.329	2.114	.040	.012	.463	.503	.295	[illegible]
	CAUSE_4	-.289	.153	-.432	-1.884	.066	-.598	.020	.352	-.265	[illegible]
	CAUSE_5	.317	.146	.449	2.168	.035	.023	.611	.457	.302	.250
	CAUSE_7	.158	.119	.242	1.331	.190	-.081	.398	.377	.191	.153
	CAUSE_8	-.108	.164	-.153	-.657	.515	-.439	.223	.324	-.095	-.076
	CAUSE_9	.253	.156	.337	1.623	.111	-.061	.567	.348	.230	.187
	CAUSE_12	-.110	.094	-.154	-1.161	.251	-.299	.080	.006	-.167	-.134
7	(Constant)	3.277	.658		4.981	.000	1.954	4.600			
	CAUSE_3	.233	.111	.323	2.092	.042	.009	.457	.503	.289	.240
	CAUSE_4	-.263	.147	-.393	-1.784	.081	-.559	.033	.352	-.249	-.204
	CAUSE_5	.300	.143	.424	2.097	.041	.012	.587	.457	.290	.240
	CAUSE_7	.115	.098	.175	1.169	.248	-.053	.313	.377	.166	.134
	CAUSE_9	.189	.121	.251	1.565	.124	-.054	.432	.348	.220	.179
	CAUSE_12	-.124	.091	-.174	-1.359	.180	-.307	.059	.006	-.193	-.156

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
8	(Constant)	3.340	.658		5.075	.000	2.018	4.663			
	CAUSE_3	.257	.110	.355	2.334	.024	.036	.478	.503	.316	.268
	CAUSE_4	-.219	.143	-.328	-1.532	.132	-.506	.068	.352	-.214	-.176
	CAUSE_5	.279	.142	.395	1.958	.056	-.007	.565	.457	.269	.225
	CAUSE_9	.238	.114	.316	2.087	.042	.009	.466	.348	.286	.240
	CAUSE_12	-.130	.091	-.182	-1.423	.161	-.314	.054	.006	-.199	-.164
9	(Constant)	2.891	.583		4.956	.000	1.719	4.063			
	CAUSE_3	.261	.111	.362	2.354	.023	.038	.484	.503	.316	.273
	CAUSE_4	-.170	.140	-.254	-1.211	.232	-.451	.112	.352	-.169	-.141
	CAUSE_5	.238	.141	.336	1.688	.098	-.045	.520	.457	.232	.196
	CAUSE_9	.172	.105	.228	1.633	.109	-.039	.382	.348	.225	[illegible]
10	(Constant)	2.874	.586		4.906	.000	1.698	4.050			
	CAUSE_3	.239	.110	.331	2.171	.035	.018	.459	.503	.291	[illegible]
	CAUSE_5	.130	.110	.184	1.185	.241	-.090	.350	.457	.164	[illegible]
	CAUSE_9	.120	.097	.160	1.246	.218	-.074	.314	.348	.172	[illegible]
11	(Constant)	3.052	.568		5.369	.000	1.911	4.192			
	CAUSE_3	.314	.090	.434	3.474	.001	.132	.495	.503	.434	[illegible]
	CAUSE_9	.148	.094	.196	1.571	.122	-.041	.337	.348	.213	[illegible]
12	(Constant)	3.495	.500		6.985	.000	2.491	4.498			
	CAUSE_3	.363	.086	.502	4.237	.000	.191	.535	.503	.503	[illegible]

j. Predictors: (Constant), CAUSE_3, CAUSE_5, CAUSE_9
k. Predictors: (Constant), CAUSE_3, CAUSE_9
l. Predictors: (Constant), CAUSE_3
m. Dependent Variable: SCP4

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	3.050	.798		3.822	.000	1.439	4.660			
	CAUSE_1	-3.147E-02	.188	-.044	-.167	.868	-.411	.348	.309	-.026	-.020
	CAUSE_2	4.617E-02	.229	.063	.201	.841	-.416	.509	.374	.031	.024
	CAUSE_3	.254	.131	.351	1.931	.060	-.011	.519	.503	.286	.233
	CAUSE_4	-.295	.183	-.441	-1.613	.114	-.663	.074	.352	-.242	-.195
	CAUSE_5	.312	.156	.442	2.005	.051	-.002	.627	.457	.296	.242
	CAUSE_6	-1.140E-02	.024	-.064	-.470	.641	-.060	.038	.067	-.072	-.057
	CAUSE_7	.166	.126	.253	1.317	.195	-.088	.420	.377	.199	.159
	CAUSE_8	-.139	.197	-.196	-.704	.485	-.537	.259	.324	-.108	-.085
	CAUSE_9	.198	.179	.264	1.107	.275	-.163	.560	.348	.168	.134
	CAUSE_10	9.425E-02	.168	.117	.562	.577	-.244	.433	.248	.086	[illegible]
	CAUSE_11	1.860E-02	.162	.028	.115	.909	-.309	.346	.285	.018	[illegible]
	CAUSE_12	-.124	.114	-.174	-1.085	.284	-.355	.107	.006	-.165	[illegible]
2	(Constant)	3.037	.781		3.887	.000	1.462	4.613			
	CAUSE_1	-3.130E-02	.186	-.044	-.168	.867	-.406	.343	.309	-.026	[illegible]
	CAUSE_2	4.817E-02	.226	.065	.213	.832	-.407	.504	.374	.033	[illegible]
	CAUSE_3	.250	.127	.347	1.973	.055	-.006	.506	.503	.288	[illegible]
	CAUSE_4	-.296	.180	-.443	-1.642	.108	-.659	.067	.352	-.243	[illegible]
	CAUSE_5	.314	.153	.445	2.055	.046	.006	.623	.457	.299	[illegible]
	CAUSE_6	-1.198E-02	.023	-.067	-.511	.612	-.059	.035	.067	-.078	[illegible]
	CAUSE_7	.166	.125	.254	1.334	.189	-.085	.417	.377	.199	[illegible]
	CAUSE_8	-.130	.178	-.183	-.729	.470	-.489	.229	.324	-.110	[illegible]
	CAUSE_9	.203	.173	.270	1.177	.246	-.145	.551	.348	.177	.140
	CAUSE_10	.100	.157	.124	.638	.527	-.217	.418	.248	.097	.076
	CAUSE_12	-.125	.113	-.175	-1.110	.273	-.352	.102	.006	-.167	-.132
3	(Constant)	3.039	.773		3.934	.000	1.482	4.596			
	CAUSE_2	2.037E-02	.153	.028	.134	.894	-.287	.328	.374	.020	.016
	CAUSE_3	.245	.122	.340	2.014	.050	.000	.491	.503	.291	.238
	CAUSE_4	-.294	.178	-.440	-1.654	.105	-.653	.064	.352	-.242	-.195
	CAUSE_5	.315	.151	.446	2.081	.043	.010	.620	.457	.299	.245
	CAUSE_6	-1.263E-02	.023	-.071	-.553	.583	-.059	.033	.067	-.083	-.065
	CAUSE_7	.168	.123	.256	1.365	.179	-.080	.415	.377	.202	.161
	CAUSE_8	-.129	.176	-.183	-.734	.467	-.484	.226	.324	-.110	-.087
	CAUSE_9	.206	.170	.274	1.214	.231	-.136	.548	.348	.180	.143
	CAUSE_10	.102	.155	.126	.657	.515	-.211	.415	.248	.098	.077
	CAUSE_12	-.132	.105	-.184	-1.257	.215	-.342	.079	.006	-.186	-.148

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_3	.570	1.754
	CAUSE_4	.289	3.458
	CAUSE_5	.325	3.073
	CAUSE_9	.578	1.730
	CAUSE_12	.806	1.241
9	(Constant)		
	CAUSE_3	.571	1.752
	CAUSE_4	.307	3.253
	CAUSE_5	.339	2.947
	CAUSE_9	.693	1.443
10	(Constant)		
	CAUSE_3	.587	1.703
	CAUSE_5	.565	1.771
	CAUSE_9	.827	1.209
11	(Constant)		
	CAUSE_3	.878	1.140
	CAUSE_9	.878	1.140
12	(Constant)		
	CAUSE_3	1.000	1.000

a. Dependent Variable: SCP4

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.150	6.668
	CAUSE_3	.440	2.272
	CAUSE_4	.195	5.125
	CAUSE_5	.299	3.343
	CAUSE_6	.783	1.277
	CAUSE_7	.394	2.541
	CAUSE_8	.187	5.351
	CAUSE_9	.257	3.897
	CAUSE_10	.337	2.964
	CAUSE_11	.250	3.995
	CAUSE_12	.568	1.761
2	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.151	6.629
	CAUSE_3	.460	2.173
	CAUSE_4	.196	5.106
	CAUSE_5	.303	3.299
	CAUSE_6	.818	1.223
	CAUSE_7	.394	2.541
	CAUSE_8	.225	4.453
	CAUSE_9	.271	3.695
	CAUSE_10	.375	2.664
	CAUSE_12	.571	1.751
3	(Constant)		
	CAUSE_2	.323	3.093
	CAUSE_3	.489	2.043
	CAUSE_4	.197	5.088
	CAUSE_5	.303	3.298
	CAUSE_6	.841	1.189
	CAUSE_7	.396	2.527
	CAUSE_8	.225	4.451
	CAUSE_9	.273	3.657
	CAUSE_10	.377	2.655
	CAUSE_12	.647	1.545

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP4	5.949	1.4041	117
CAUSE_1	6.329	1.6945	117
CAUSE_2	5.368	1.7731	117
CAUSE_3	5.581	1.7665	117
CAUSE_4	5.350	1.6417	117
CAUSE_5	5.261	1.6976	117
CAUSE_6	5.171	1.7034	117
CAUSE_7	5.500	1.7145	117
CAUSE_8	6.444	1.6697	117
CAUSE_9	7.162	1.6646	117
CAUSE_10	5.615	1.5134	117
CAUSE_11	5.551	1.6287	117
CAUSE_12	5.765	1.7039	117

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_3	.533	1.877
	CAUSE_4	.250	3.995
	CAUSE_5	.305	3.276
	CAUSE_6	.864	1.157
	CAUSE_7	.397	2.516
	CAUSE_8	.233	4.291
	CAUSE_9	.274	3.644
	CAUSE_10	.385	2.596
	CAUSE_12	.648	1.544
5	(Constant)		
	CAUSE_3	.533	1.876
	CAUSE_4	.252	3.968
	CAUSE_5	.307	3.257
	CAUSE_7	.402	2.486
	CAUSE_8	.235	4.257
	CAUSE_9	.276	3.628
	CAUSE_10	.390	2.565
	CAUSE_12	.654	1.529
6	(Constant)		
	CAUSE_3	.550	1.820
	CAUSE_4	.252	3.967
	CAUSE_5	.310	3.226
	CAUSE_7	.403	2.484
	CAUSE_8	.246	4.070
	CAUSE_9	.309	3.238
	CAUSE_12	.760	1.316
7	(Constant)		
	CAUSE_3	.551	1.813
	CAUSE_4	.271	3.696
	CAUSE_5	.320	3.122
	CAUSE_7	.583	1.715
	CAUSE_9	.510	1.962
	CAUSE_12	.803	1.245

	CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5ª	.	Enter
2	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP4

Analysis for Ca-SCP4-SC

	CAUSE_1	.214	1.000	.662	.486	.432	.520	.496	.329	.453	.384
	CAUSE_2	.308	.662	1.000	.607	.561	.516	.445	.355	.402	.390
	CAUSE_3	.276	.486	.607	1.000	.624	.565	.566	.500	.319	.473
	CAUSE_4	.367	.432	.561	.624	1.000	.644	.472	.420	.395	.386
	CAUSE_5	.313	.520	.516	.565	.644	1.000	.654	.405	.446	.376
	CAUSE_6	.275	.496	.445	.566	.472	.654	1.000	.481	.417	.464
	CAUSE_7	.352	.329	.355	.500	.420	.405	.481	1.000	.416	.331
	CAUSE_8	.250	.453	.402	.319	.395	.446	.417	.416	1.000	.478
	CAUSE_9	.196	.384	.390	.473	.386	.376	.464	.331	.478	1.000
	CAUSE_10	.296	.331	.265	.394	.487	.492	.348	.229	.339	.502
	CAUSE_11	.286	.288	.386	.406	.495	.429	.356	.418	.483	.537
	CAUSE_12	.224	.199	.112	.218	.237	.238	.278	.292	.350	.289
Sig. (1-tailed)	SCP4	.	.010	.000	.001	.000	.000	.001	.000	.003	.017
	CAUSE_1	.010	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE_3	.001	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE_4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE_5	.000	.000	.000	.000	.000	.	.000	.000	.000	.000
	CAUSE_6	.001	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE_7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE_8	.003	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE_9	.017	.000	.000	.000	.000	.000	.000	.000	.000	.
	CAUSE_10	.001	.000	.002	.000	.000	.000	.000	.006	.000	.000
	CAUSE_11	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_12	.009	.016	.114	.009	.005	.005	.001	.001	.000	.001
N	SCP4	117	117	117	117	117	117	117	117	117	117
	CAUSE_1	117	117	117	117	117	117	117	117	117	117
	CAUSE_2	117	117	117	117	117	117	117	117	117	117
	CAUSE_3	117	117	117	117	117	117	117	117	117	117
	CAUSE_4	117	117	117	117	117	117	117	117	117	117
	CAUSE_5	117	117	117	117	117	117	117	117	117	117
	CAUSE_6	117	117	117	117	117	117	117	117	117	117
	CAUSE_7	117	117	117	117	117	117	117	117	117	117
	CAUSE_8	117	117	117	117	117	117	117	117	117	117
	CAUSE_9	117	117	117	117	117	117	117	117	117	117
	CAUSE_10	117	117	117	117	117	117	117	117	117	117
	CAUSE_11	117	117	117	117	117	117	117	117	117	117
	CAUSE_12	117	117	117	117	117	117	117	117	117	117

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP4	.296	.286	.224
	CAUSE_1	.331	.288	.199
	CAUSE_2	.265	.386	.112
	CAUSE_3	.394	.406	.218
	CAUSE_4	.487	.495	.237
	CAUSE_5	.492	.429	.238
	CAUSE_6	.348	.356	.278
	CAUSE_7	.229	.418	.292
	CAUSE_8	.339	.483	.350
	CAUSE_9	.502	.537	.289
	CAUSE_10	1.000	.506	.349
	CAUSE_11	.506	1.000	.392
	CAUSE_12	.349	.392	1.000
Sig. (1-tailed)	SCP4	.001	.001	.008
	CAUSE_1	.000	.001	.016
	CAUSE_2	.002	.000	.114
	CAUSE_3	.000	.000	.009
	CAUSE_4	.000	.000	.005
	CAUSE_5	.000	.000	.005
	CAUSE_6	.000	.000	.001
	CAUSE_7	.006	.000	.001
	CAUSE_8	.000	.000	.000
	CAUSE_9	.000	.000	.001
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.000
	CAUSE_12	.000	.000	.
N	SCP4	117	117	117
	CAUSE_1	117	117	117
	CAUSE_2	117	117	117
	CAUSE_3	117	117	117
	CAUSE_4	117	117	117
	CAUSE_5	117	117	117
	CAUSE_6	117	117	117
	CAUSE_7	117	117	117
	CAUSE_8	117	117	117
	CAUSE_9	117	117	117
	CAUSE_10	117	117	117
	CAUSE_11	117	117	117
	CAUSE_12	117	117	117

Analysis for Ca-SCP4-SC

Analysis for Ca-SCP4-SC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	3.159	.681		4.641	.000	1.809	4.509			
	CAUSE_1	-7.816E-02	.105	-.094	-.744	.458	-.286	.130	.214	-.073	-.064
	CAUSE_2	.166	.108	.209	1.529	.129	-.049	.380	.308	.148	.132
	CAUSE_3	-7.503E-02	.108	-.094	-.696	.488	-.289	.139	.276	-.068	-.060
	CAUSE_4	.128	.114	.149	1.121	.265	-.098	.354	.367	.109	.097
	CAUSE_5	1.003E-02	.116	.012	.086	.932	-.221	.241	.313	.008	.007
	CAUSE_6	3.650E-02	.107	.044	.342	.733	-.175	.248	.275	.033	.030
	CAUSE_7	.184	.091	.224	2.026	.045	.004	.363	.352	.195	.175
	CAUSE_8	1.119E-02	.097	.013	.116	.908	-.181	.203	.250	.011	.010
	CAUSE_9	-6.339E-02	.101	-.075	-.625	.533	-.264	.138	.196	-.061	-.054
	CAUSE_10	.157	.109	.169	1.434	.155	-.060	.373	.296	.139	.124
	CAUSE_11	-1.388E-03	.105	-.002	-.013	.989	-.210	.207	.286	-.001	-.00
	CAUSE_12	6.778E-02	.082	.082	.827	.410	-.095	.230	.224	.091	.07
2	(Constant)	3.159	.677		4.667	.000	1.817	4.502			
	CAUSE_1	-7.795E-02	.103	-.094	-.755	.452	-.283	.127	.214	-.073	-.06
	CAUSE_2	.165	.107	.209	1.550	.124	-.046	.377	.308	.150	.13
	CAUSE_3	-7.497E-02	.107	-.094	-.699	.486	-.287	.138	.276	-.068	-.060
	CAUSE_4	.127	.112	.149	1.136	.259	-.095	.350	.367	.110	.09
	CAUSE_5	9.959E-03	.116	.012	.086	.932	-.220	.240	.313	.008	.007
	CAUSE_6	3.661E-02	.106	.044	.345	.730	-.174	.247	.275	.034	.030
	CAUSE_7	.183	.089	.224	2.065	.041	.007	.359	.352	.198	.17
	CAUSE_8	1.098E-02	.095	.013	.116	.908	-.177	.199	.250	.011	.010
	CAUSE_9	-6.373E-02	.098	-.076	-.653	.515	-.257	.130	.196	-.064	-.056
	CAUSE_10	.156	.106	.168	1.469	.145	-.055	.367	.296	.142	.126
	CAUSE_12	6.758E-02	.080	.082	.843	.401	-.091	.227	.224	.082	.072
3	(Constant)	3.158	.674		4.688	.000	1.822	4.493			
	CAUSE_1	-7.705E-02	.102	-.093	-.754	.453	-.280	.126	.214	-.073	-.064
	CAUSE_2	.166	.106	.209	1.565	.121	-.044	.376	.308	.150	.134
	CAUSE_3	-7.441E-02	.106	-.094	-.699	.486	-.286	.137	.276	-.068	-.060
	CAUSE_4	.130	.107	.152	1.224	.224	-.081	.342	.367	.118	.105
	CAUSE_6	4.039E-02	.096	.049	.421	.675	-.150	.231	.275	.041	.036
	CAUSE_7	.183	.088	.224	2.073	.041	.008	.358	.352	.197	.177
	CAUSE_8	1.206E-02	.094	.014	.129	.898	-.174	.198	.250	.012	.011
	CAUSE_9	-6.504E-02	.096	-.077	-.678	.499	-.255	.125	.196	-.066	-.058
	CAUSE_10	.159	.103	.171	1.543	.126	-.045	.362	.296	.148	.132
	CAUSE_12	6.721E-02	.080	.082	.844	.401	-.091	.225	.224	.082	.072

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	3.168	.666		4.758	.000	1.848	4.488			
	CAUSE_1	-7.471E-02	.100	-.090	-.746	.457	-.273	.124	.214	-.072	-.064
	CAUSE_2	.167	.105	.211	1.591	.114	-.041	.375	.308	.152	.136
	CAUSE_3	-7.702E-02	.104	-.097	-.740	.461	-.283	.129	.276	-.071	-.063
	CAUSE_4	.132	.105	.154	1.252	.213	-.077	.341	.367	.120	.107
	CAUSE_6	4.124E-02	.095	.050	.433	.666	-.148	.230	.275	.042	.037
	CAUSE_7	.186	.086	.227	2.158	.033	.015	.356	.352	.204	.184
	CAUSE_9	-6.182E-02	.092	-.073	-.670	.504	-.245	.121	.196	-.065	-.057
	CAUSE_10	.159	.102	.171	1.552	.124	-.044	.361	.296	.148	.132
	CAUSE_12	6.908E-02	.078	.084	.886	.378	-.086	.224	.224	.085	.075
5	(Constant)	3.149	.662		4.758	.000	1.837	4.461			
	CAUSE_1	-6.513E-02	.097	-.079	-.669	.505	-.258	.128	.214	-.064	-.05
	CAUSE_2	.166	.105	.209	1.583	.116	-.042	.373	.308	.151	.13
	CAUSE_3	-6.763E-02	.101	-.085	-.667	.506	-.269	.133	.276	-.064	-.05
	CAUSE_4	.136	.105	.159	1.298	.197	-.072	.343	.367	.124	.11
	CAUSE_7	.193	.084	.236	2.310	.023	.027	.359	.352	.217	.19
	CAUSE_9	-5.486E-02	.090	-.065	-.607	.545	-.234	.124	.196	-.058	-.05
	CAUSE_10	.159	.102	.171	1.557	.122	-.043	.361	.296	.148	.13
	CAUSE_12	7.159E-02	.077	.087	.924	.358	-.082	.225	.224	.089	.07
6	(Constant)	3.023	.626		4.826	.000	1.781	4.265			
	CAUSE_1	-6.890E-02	.097	-.083	-.712	.478	-.261	.123	.214	-.068	-.060
	CAUSE_2	.159	.104	.201	1.534	.128	-.046	.365	.308	.145	.130
	CAUSE_3	-7.843E-02	.100	-.099	-.788	.432	-.276	.119	.276	-.075	-.067
	CAUSE_4	.140	.104	.163	1.341	.183	-.067	.346	.367	.127	.113
	CAUSE_7	.189	.083	.231	2.272	.025	.024	.354	.352	.213	.192
	CAUSE_10	.138	.096	.148	1.440	.153	-.052	.327	.296	.137	.122
	CAUSE_12	6.698E-02	.077	.081	.871	.386	-.085	.219	.224	.083	.074
7	(Constant)	2.907	.603		4.817	.000	1.711	4.103			
	CAUSE_2	.121	.088	.152	1.366	.175	-.054	.296	.308	.129	.115
	CAUSE_3	-8.235E-02	.099	-.104	-.831	.408	-.279	.114	.276	-.079	-.070
	CAUSE_4	.142	.104	.166	1.370	.173	-.063	.348	.367	.130	.116
	CAUSE_7	.185	.083	.226	2.235	.027	.021	.349	.352	.208	.189
	CAUSE_10	.127	.094	.137	1.350	.180	-.060	.314	.296	.128	.114
	CAUSE_12	6.252E-02	.076	.076	.818	.415	-.089	.214	.224	.078	.069

Model Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	Change Statistics F Change	Change Statistics df1	Change Statistics df2	Change Statistics Sig. F Change
1	.474[a]	.224	.135	1.3061	.224	2.505	12	104	.006
2	.474[b]	.224	.143	1.2999	.000	.000	1	106	.989
3	.473[c]	.224	.151	1.2938	.000	.007	1	107	.932
4	.473[d]	.224	.159	1.2878	.000	.017	1	108	.898
5	.472[e]	.223	.165	1.2830	-.001	.187	1	109	.666
6	.469[f]	.220	.170	1.2792	-.003	.368	1	110	.545
7	.465[g]	.216	.174	1.2764	-.004	.506	1	111	.478
8	.460[h]	.212	.176	1.2745	-.005	.669	1	112	.415
9	.455[i]	.207	.178	1.2727	-.005	.682	1	113	.411
10	.445[j]	.198	.177	1.2738	-.008	1.196	1	114	.276
11	.427[k]	.182	.168	1.2810	-.016	2.296	1	115	.133

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3
d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3
e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3
f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4, CAUSE_1, CAUSE_3
g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4, CAUSE_3
h. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4, CAUSE_3
i. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4
j. Predictors: (Constant), CAUSE_10, CAUSE_7, CAUSE_4
k. Predictors: (Constant), CAUSE_7, CAUSE_4
l. Dependent Variable: SCP4

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.276	12	4.273	2.505	.006[a]
	Residual	177.417	104	1.706		
	Total	228.692	116			
2	Regression	51.275	11	4.661	2.759	.004[b]
	Residual	177.417	105	1.690		
	Total	228.692	116			
3	Regression	51.263	10	5.126	3.063	.002[c]
	Residual	177.429	106	1.674		
	Total	228.692	116			
4	Regression	51.235	9	5.693	3.433	.001[d]
	Residual	177.457	107	1.658		
	Total	228.692	116			
5	Regression	50.925	8	6.366	3.867	.000[e]
	Residual	177.768	108	1.646		
	Total	228.692	116			
6	Regression	50.319	7	7.188	4.393	.000[f]
	Residual	178.373	109	1.636		
	Total	228.692	116			
7	Regression	49.491	6	8.248	5.063	.000[g]
	Residual	179.202	110	1.629		
	Total	228.692	116			
8	Regression	48.401	5	9.680	5.960	.000[h]
	Residual	180.291	111	1.624		
	Total	228.692	116			
9	Regression	47.293	4	11.823	7.300	.000[i]
	Residual	181.400	112	1.620		
	Total	228.692	116			
10	Regression	45.355	3	15.118	9.318	.000[j]
	Residual	183.337	113	1.622		
	Total	228.692	116			
11	Regression	41.630	2	20.815	12.685	.000[k]
	Residual	187.062	114	1.641		
	Total	228.692	116			

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3
d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3
e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3
f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4, CAUSE_1, CAUSE_3
g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4, CAUSE_3
h. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4, CAUSE_3
i. Predictors: (Constant), CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_4

Analysis for Ca-SCP4-SC

Model		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.496	2.015
	CAUSE_2	.412	2.427
	CAUSE_3	.423	2.363
	CAUSE_4	.478	2.093
	CAUSE_6	.543	1.843
	CAUSE_7	.658	1.521
	CAUSE_9	.607	1.648
	CAUSE_10	.597	1.675
	CAUSE_12	.810	1.235
5	(Constant)		
	CAUSE_1	.522	1.916
	CAUSE_2	.413	2.424
	CAUSE_3	.442	2.260
	CAUSE_4	.481	2.078
	CAUSE_7	.688	1.453
	CAUSE_9	.626	1.598
	CAUSE_10	.597	1.675
	CAUSE_12	.814	1.228
6	(Constant)		
	CAUSE_1	.524	1.908
	CAUSE_2	.417	2.399
	CAUSE_3	.457	2.191
	CAUSE_4	.483	2.071
	CAUSE_7	.694	1.442
	CAUSE_10	.675	1.482
	CAUSE_12	.822	1.216
7	(Constant)		
	CAUSE_2	.572	1.748
	CAUSE_3	.458	2.184
	CAUSE_4	.484	2.068
	CAUSE_7	.697	1.435
	CAUSE_10	.691	1.447
	CAUSE_12	.828	1.208

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
8	(Constant)		
	CAUSE_2	.574	1.742
	CAUSE_3	.458	2.184
	CAUSE_4	.484	2.067
	CAUSE_7	.730	1.370
	CAUSE_10	.746	1.340
9	(Constant)		
	CAUSE_2	.668	1.497
	CAUSE_4	.528	1.895
	CAUSE_7	.802	1.247
	CAUSE_10	.762	1.312
10	(Constant)		
	CAUSE_4	.662	1.509
	CAUSE_7	.823	1.216
	CAUSE_10	.762	1.312
11	(Constant)		
	CAUSE_4	.823	1.215
	CAUSE_7	.823	1.215

a. Dependent Variable: SCP4

Analysis for Ca-SCP4-SC

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	3.080	.564		5.460	.000	1.962	4.198			
	CAUSE_2	.116	.088	.147	1.322	.189	-.058	.291	.308	.125	.111
	CAUSE_3	-8.177E-02	.099	-.103	-.826	.411	-.278	.114	.276	-.078	-.070
	CAUSE_4	.144	.104	.168	1.391	.167	-.061	.349	.367	.131	.117
	CAUSE_7	.200	.081	.244	2.470	.015	.039	.360	.352	.228	.208
	CAUSE_10	.148	.091	.160	1.636	.105	-.031	.327	.296	.153	.138
9	(Constant)	3.073	.563		5.457	.000	1.957	4.189			
	CAUSE_2	8.920E-02	.082	.113	1.094	.276	-.072	.251	.308	.103	.092
	CAUSE_4	.119	.099	.140	1.205	.231	-.077	.316	.367	.113	.101
	CAUSE_7	.180	.077	.219	2.333	.021	.027	.332	.352	.215	.196
	CAUSE_10	.137	.089	.148	1.534	.128	-.040	.314	.296	.143	.129
10	(Constant)	3.226	.546		5.906	.000	2.144	4.308			
	CAUSE_4	.168	.089	.197	1.901	.060	-.007	.344	.367	.176	[illegible]
	CAUSE_7	.193	.076	.236	2.537	.013	.042	.344	.352	.232	[illegible]
	CAUSE_10	.136	.089	.146	1.515	.133	-.042	.313	.296	.141	[illegible]
11	(Constant)	3.650	.472		7.742	.000	2.716	4.584			
	CAUSE_4	.228	.080	.266	2.849	.005	.069	.386	.367	.258	[illegible]
	CAUSE_7	.197	.076	.240	2.571	.011	.045	.348	.352	.234	[illegible]

Analysis for Ca-SCP4-SC

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	CAUSE_1	.465	2.152
	CAUSE_2	.399	2.507
	CAUSE_3	.406	2.466
	CAUSE_4	.421	2.378
	CAUSE_5	.376	2.657
	CAUSE_6	.444	2.250
	CAUSE_7	.610	1.639
	CAUSE_8	.564	1.774
	CAUSE_9	.516	1.938
	CAUSE_10	.538	1.859
	CAUSE_11	.502	1.991
	CAUSE_12	.754	1.326
2	(Constant)		
	CAUSE_1	.476	2.102
	CAUSE_2	.407	2.456
	CAUSE_3	.406	2.461
	CAUSE_4	.429	2.330
	CAUSE_5	.377	2.652
	CAUSE_6	.447	2.237
	CAUSE_7	.629	1.591
	CAUSE_8	.579	1.728
	CAUSE_9	.552	1.813
	CAUSE_10	.561	1.781
	CAUSE_12	.781	1.281
3	(Constant)		
	CAUSE_1	.481	2.080
	CAUSE_2	.409	2.448
	CAUSE_3	.408	2.452
	CAUSE_4	.472	2.120
	CAUSE_6	.540	1.851
	CAUSE_7	.629	1.590
	CAUSE_8	.589	1.698
	CAUSE_9	.565	1.769
	CAUSE_10	.597	1.675
	CAUSE_12	.783	1.277

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP4	.566	.584	.420
	CAUSE_1	.617	.452	.323
	CAUSE_2	.624	.413	.325
	CAUSE_3	.500	.555	.316
	CAUSE_4	.631	.530	.221
	CAUSE_5	.424	.165	-.090
	CAUSE_6	.414	.315	.396
	CAUSE_7	.404	.508	.466
	CAUSE_8	.665	.669	.522
	CAUSE_9	.718	.736	.401
	CAUSE_10	1.000	.737	.394
	CAUSE_11	.737	1.000	.731
	CAUSE_12	.394	.731	1.000
Sig. (1-tailed)	SCP4	.002	.001	.018
	CAUSE_1	.001	.012	.058
	CAUSE_2	.000	.020	.057
	CAUSE_3	.006	.002	.062
	CAUSE_4	.000	.003	.144
	CAUSE_5	.017	.216	.335
	CAUSE_6	.020	.063	.025
	CAUSE_7	.023	.005	.009
	CAUSE_8	.000	.000	.004
	CAUSE_9	.000	.000	.023
	CAUSE_10	.	.000	.026
	CAUSE_11	.000	.	.000
	CAUSE_12	.026	.000	.
N	SCP4	25	25	25
	CAUSE_1	25	25	25
	CAUSE_2	25	25	25
	CAUSE_3	25	25	25
	CAUSE_4	25	25	25
	CAUSE_5	25	25	25
	CAUSE_6	25	25	25
	CAUSE_7	25	25	25
	CAUSE_8	25	25	25
	CAUSE_9	25	25	25
	CAUSE_10	25	25	25
	CAUSE_11	25	25	25
	CAUSE_12	25	25	25

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4[b]	.	Enter
2	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP4-CC

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP4	5.220	1.5817	25
CAUSE_1	6.800	2.2913	25
CAUSE_2	6.680	2.1884	25
CAUSE_3	6.600	2.2913	25
CAUSE_4	6.820	2.3313	25
CAUSE_5	6.700	2.2638	25
CAUSE_6	6.200	2.2958	25
CAUSE_7	5.680	2.0355	25
CAUSE_8	6.400	1.8428	25
CAUSE_9	5.520	2.3826	25
CAUSE_10	6.440	2.0530	25
CAUSE_11	5.320	2.5612	25
CAUSE_12	5.600	2.3629	25

Analysis for Ca-SCP4-CC

Correlations

		SCP4	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8
Pearson Correlation	SCP4	1.000	.507	.470	.382	.452	.130	.343	.314	.576
	CAUSE_1	.507	1.000	.942	.571	.835	.651	.440	.316	.405
	CAUSE_2	.470	.942	1.000	.597	.829	.621	.442	.294	.452
	CAUSE_3	.382	.571	.597	1.000	.746	.442	.202	.472	.528
	CAUSE_4	.452	.835	.829	.746	1.000	.747	.281	.251	.388
	CAUSE_5	.130	.651	.621	.442	.747	1.000	.423	-.080	.210
	CAUSE_6	.343	.440	.442	.202	.281	.423	1.000	.277	.510
	CAUSE_7	.314	.316	.294	.472	.251	-.080	.277	1.000	.530
	CAUSE_8	.576	.405	.452	.528	.388	.210	.510	.530	1.000
	CAUSE_9	.582	.386	.385	.498	.389	.088	.155	.611	.748
	CAUSE_10	.566	.617	.624	.500	.631	.424	.414	.404	.665
	CAUSE_11	.584	.452	.413	.555	.530	.165	.315	.508	.669
	CAUSE_12	.420	.323	.325	.316	.221	-.090	.396	.466	.522
Sig. (1-tailed)	SCP4	.	.005	.009	.030	.012	.268	.047	.063	.001
	CAUSE_1	.005	.	.000	.001	.000	.000	.014	.062	.022
	CAUSE_2	.009	.000	.	.001	.000	.000	.013	.077	.012
	CAUSE_3	.030	.001	.001	.	.000	.014	.166	.009	.003
	CAUSE_4	.012	.000	.000	.000	.	.000	.086	.113	.028
	CAUSE_5	.268	.000	.000	.014	.000	.	.018	.351	.157
	CAUSE_6	.047	.014	.013	.166	.086	.018	.	.090	.005
	CAUSE_7	.063	.062	.077	.009	.113	.351	.090	.	.003
	CAUSE_8	.001	.022	.012	.003	.028	.157	.005	.003	.
	CAUSE_9	.001	.028	.029	.006	.027	.338	.229	.001	.000
	CAUSE_10	.002	.001	.000	.006	.000	.017	.020	.023	.000
	CAUSE_11	.001	.012	.020	.002	.003	.216	.063	.005	.000
	CAUSE_12	.018	.058	.057	.062	.144	.335	.025	.009	.004
N	SCP4	25	25	25	25	25	25	25	25	25
	CAUSE_1	25	25	25	25	25	25	25	25	25
	CAUSE_2	25	25	25	25	25	25	25	25	25
	CAUSE_3	25	25	25	25	25	25	25	25	25
	CAUSE_4	25	25	25	25	25	25	25	25	25
	CAUSE_5	25	25	25	25	25	25	25	25	25
	CAUSE_6	25	25	25	25	25	25	25	25	25
	CAUSE_7	25	25	25	25	25	25	25	25	25
	CAUSE_8	25	25	25	25	25	25	25	25	25
	CAUSE_9	25	25	25	25	25	25	25	25	25
	CAUSE_10	25	25	25	25	25	25	25	25	25
	CAUSE_11	25	25	25	25	25	25	25	25	25

Analysis for Ca-SCP4-CC

Model		Sum of Squares	df	Mean Square	F	Sig.
	Total	60.040	24			
2	Regression	37.805	11	3.437	2.009	.116[b]
	Residual	22.235	13	1.710		
	Total	60.040	24			
3	Regression	37.796	10	3.780	2.379	.067[c]
	Residual	22.244	14	1.589		
	Total	60.040	24			
4	Regression	37.713	9	4.190	2.815	.037[d]
	Residual	22.327	15	1.488		
	Total	60.040	24			
5	Regression	37.281	8	4.660	3.276	.021[e]
	Residual	22.759	16	1.422		
	Total	60.040	24			
6	Regression	36.790	7	5.256	3.843	.011[f]
	Residual	23.250	17	1.368		
	Total	60.040	24			
7	Regression	35.401	6	5.900	4.310	.007[g]
	Residual	24.639	18	1.369		
	Total	60.040	24			
8	Regression	34.452	5	6.890	5.116	.004[h]
	Residual	25.588	19	1.347		
	Total	60.040	24			
9	Regression	30.829	4	7.707	5.277	.005[i]
	Residual	29.211	20	1.461		
	Total	60.040	24			

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

c. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

d. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_1, CAUSE_4

f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_2, CAUSE_1, CAUSE_4

g. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_4

h. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_4

i. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_4

j. Dependent Variable: SCP4

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	2.721	1.477		1.842	.090	-.497	5.939			
	CAUSE_1	.515	.418	.746	1.231	.242	-.396	1.426	.507	.335	.216
	CAUSE_2	-.483	.485	-.669	-.996	.339	-1.541	.574	.470	-.276	-.175
	CAUSE_3	-4.696E-02	.228	-.068	-.206	.840	-.543	.450	.382	-.059	-.036
	CAUSE_4	.571	.433	.842	1.319	.212	-.372	1.514	.452	.356	.232
	CAUSE_5	-.556	.276	-.796	-2.015	.067	-1.157	.045	.130	-.503	-.354
	CAUSE_6	.276	.212	.400	1.300	.218	-.186	.738	.343	.351	.228
	CAUSE_7	-.312	.218	-.402	-1.430	.178	-.788	.164	.314	-.382	-.251
	CAUSE_8	.186	.314	.217	.591	.565	-.499	.870	.576	.168	.104
	CAUSE_9	.319	.293	.481	1.089	.298	-.320	.959	.582	.300	.191
	CAUSE_10	5.688E-03	.289	.007	.020	.985	-.625	.636	.566	.006	.003
	CAUSE_11	-.124	.358	-.201	-.347	.735	-.903	.655	.584	-.100	-.061
	CAUSE_12	1.860E-02	.258	.028	.072	.944	-.544	.581	.420	.021	.01[illegible]
2	(Constant)	2.729	1.370		1.991	.068	-.232	5.689			
	CAUSE_1	.514	.400	.745	1.285	.221	-.350	1.378	.507	.336	.21[illegible]
	CAUSE_2	-.481	.450	-.665	-1.069	.305	-1.453	.491	.470	-.284	-.18[illegible]
	CAUSE_3	-4.793E-02	.214	-.069	-.224	.826	-.510	.414	.382	-.062	-.03[illegible]
	CAUSE_4	.571	.416	.842	1.373	.193	-.327	1.470	.452	.356	.23[illegible]
	CAUSE_5	-.556	.264	-.795	-2.104	.055	-1.126	.015	.130	-.504	-.35[illegible]
	CAUSE_6	.276	.202	.401	1.368	.194	-.160	.712	.343	.355	.23[illegible]
	CAUSE_7	-.312	.210	-.402	-1.488	.160	-.766	.141	.314	-.382	-.25[illegible]
	CAUSE_8	.186	.301	.217	.618	.547	-.464	.837	.576	.169	.104
	CAUSE_9	.321	.275	.483	1.166	.264	-.273	.915	.582	.308	.19[illegible]
	CAUSE_11	-.121	.312	-.196	-.388	.704	-.796	.554	.584	-.107	-.065
	CAUSE_12	1.715E-02	.238	.026	.072	.944	-.497	.531	.420	.020	.012
3	(Constant)	2.766	1.220		2.267	.040	.149	5.384			
	CAUSE_1	.515	.385	.745	1.335	.203	-.312	1.341	.507	.336	.217
	CAUSE_2	-.471	.414	-.652	-1.138	.274	-1.360	.417	.470	-.291	-.185
	CAUSE_3	-4.717E-02	.206	-.068	-.229	.822	-.489	.394	.382	-.061	-.037
	CAUSE_4	.561	.378	.827	1.485	.160	-.250	1.372	.452	.369	.242
	CAUSE_5	-.559	.251	-.800	-2.226	.043	-1.097	-.020	.130	-.511	-.362
	CAUSE_6	.277	.194	.401	1.422	.177	-.140	.694	.343	.355	.231
	CAUSE_7	-.310	.199	-.398	-1.558	.142	-.736	.117	.314	-.384	-.253
	CAUSE_8	.189	.287	.221	.660	.520	-.427	.805	.576	.174	.107
	CAUSE_9	.311	.231	.468	1.344	.200	-.185	.807	.582	.338	.219
	CAUSE_11	-.104	.202	-.169	-.516	.614	-.538	.329	.584	-.137	-.084

Model	Variables Entered	Variables Removed	Method
	.	CAUSE_2	(criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP4

Mc Summary[j]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.794[a]	.630	.259	1.3612	.630	1.700	12	12	.185
2	.794[b]	.630	.316	1.3078	.000	.000	1	14	.985
3	.793[c]	.630	.365	1.2605	.000	.005	1	15	.944
4	.793[d]	.628	.405	1.2200	-.001	.053	1	16	.822
5	.788[e]	.621	.431	1.1927	-.007	.290	1	17	.598
6	.783[f]	.613	.453	1.1695	-.008	.345	1	18	.565
7	.768[g]	.590	.453	1.1700	-.023	1.015	1	19	.328
8	.758[h]	.574	.462	1.1605	-.016	.694	1	20	.416
9	.717[i]	.513	.416	1.2095	-.060	2.690	1	21	.117

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

c. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

d. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_1, CAUSE_4

f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_2, CAUSE_1, CAUSE_4

g. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_1, CAUSE_4

h. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_7, CAUSE_4

i. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_4

j. Dependent Variable: SCP4

Analysis for Ca-SCP4-CC

Analysis for Ca-SCP4-CC

Analysis for Ca-SCP4-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.084	11.893
	CAUSE_2	.068	14.614
	CAUSE_3	.283	3.532
	CAUSE_4	.076	13.197
	CAUSE_5	.198	5.056
	CAUSE_6	.326	3.070
	CAUSE_7	.390	2.561
	CAUSE_8	.230	4.342
	CAUSE_9	.158	6.328
	CAUSE_10	.219	4.569
	CAUSE_11	.092	10.874
	CAUSE_12	.207	4.827
2	(Constant)		
	CAUSE_1	.085	11.779
	CAUSE_2	.073	13.607
	CAUSE_3	.297	3.367
	CAUSE_4	.076	13.196
	CAUSE_5	.199	5.016
	CAUSE_6	.332	3.013
	CAUSE_7	.390	2.561
	CAUSE_8	.231	4.322
	CAUSE_9	.166	6.022
	CAUSE_11	.111	8.977
	CAUSE_12	.225	4.435
3	(Constant)		
	CAUSE_1	.085	11.773
	CAUSE_2	.081	12.410
	CAUSE_3	.298	3.359
	CAUSE_4	.085	11.732
	CAUSE_5	.205	4.879
	CAUSE_6	.332	3.011
	CAUSE_7	.405	2.471
	CAUSE_8	.236	4.231
	CAUSE_9	.218	4.591
	CAUSE_11	.247	4.051

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.087	11.453
	CAUSE_2	.081	12.372
	CAUSE_4	.104	9.606
	CAUSE_5	.205	4.878
	CAUSE_6	.343	2.919
	CAUSE_7	.459	2.179
	CAUSE_8	.255	3.918
	CAUSE_9	.221	4.530
	CAUSE_11	.247	4.049
5	(Constant)		
	CAUSE_1	.091	11.026
	CAUSE_2	.095	10.489
	CAUSE_4	.161	6.205
	CAUSE_5	.267	3.741
	CAUSE_6	.404	2.473
	CAUSE_7	.474	2.110
	CAUSE_8	.260	3.848
	CAUSE_9	.282	3.547
6	(Constant)		
	CAUSE_1	.097	10.261
	CAUSE_2	.100	10.031
	CAUSE_4	.163	6.136
	CAUSE_5	.268	3.727
	CAUSE_6	.574	1.743
	CAUSE_7	.474	2.110
	CAUSE_9	.555	1.802
7	(Constant)		
	CAUSE_1	.252	3.968
	CAUSE_4	.179	5.572
	CAUSE_5	.279	3.590
	CAUSE_6	.603	1.659
	CAUSE_7	.483	2.069
	CAUSE_9	.556	1.797

Analysis for Ca-SCP4-CC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	2.776	1.181		2.351	.033	.259	5.292			
	CAUSE_1	.529	.368	.767	1.439	.171	-.255	1.313	.507	.348	.227
	CAUSE_2	-.476	.400	-.659	-1.190	.252	-1.330	.377	.470	-.294	-.187
	CAUSE_4	.524	.331	.773	1.584	.134	-.181	1.230	.452	.378	.249
	CAUSE_5	-.560	.243	-.801	-2.304	.036	-1.078	-.042	.130	-.511	-.363
	CAUSE_6	.284	.185	.413	1.534	.146	-.111	.679	.343	.368	.242
	CAUSE_7	-.325	.181	-.419	-1.801	.092	-.710	.060	.314	-.422	-.284
	CAUSE_8	.172	.268	.200	.641	.531	-.399	.742	.576	.163	.101
	CAUSE_9	.317	.222	.478	1.426	.174	-.157	.791	.582	.345	.224
	CAUSE_11	-.105	.196	-.171	-.539	.598	-.522	.312	.584	-.138	-.085
5	(Constant)	2.790	1.154		2.418	.028	.344	5.236			
	CAUSE_1	.491	.353	.711	1.391	.183	-.257	1.239	.507	.329	.214
	CAUSE_2	-.392	.360	-.543	-1.089	.292	-1.156	.371	.470	-.263	-.16[illegible]
	CAUSE_4	.418	.260	.616	1.608	.127	-.133	.970	.452	.373	.24[illegible]
	CAUSE_5	-.497	.208	-.711	-2.387	.030	-.937	-.056	.130	-.513	-.36[illegible]
	CAUSE_6	.245	.167	.356	1.471	.161	-.108	.599	.343	.345	.22[illegible]
	CAUSE_7	-.308	.174	-.396	-1.773	.095	-.676	.060	.314	-.405	-.27[illegible]
	CAUSE_8	.152	.259	.177	.587	.565	-.397	.702	.576	.145	.090
	CAUSE_9	.261	.192	.394	1.358	.193	-.147	.669	.582	.321	.209
6	(Constant)	3.011	1.069		2.817	.012	.756	5.267			
	CAUSE_1	.436	.334	.632	1.307	.209	-.268	1.140	.507	.302	.19[illegible]
	CAUSE_2	-.348	.345	-.482	-1.008	.328	-1.077	.381	.470	-.237	-.152
	CAUSE_4	.434	.254	.640	1.713	.105	-.101	.970	.452	.384	.25[illegible]
	CAUSE_5	-.504	.204	-.721	-2.475	.024	-.933	-.074	.130	-.515	-.374
	CAUSE_6	.299	.137	.433	2.175	.044	.009	.588	.343	.467	.328
	CAUSE_7	-.308	.170	-.397	-1.809	.088	-.668	.051	.314	-.402	-.273
	CAUSE_9	.341	.135	.513	2.532	.021	.057	.624	.582	.523	.382
7	(Constant)	2.832	1.055		2.685	.015	.616	5.047			
	CAUSE_1	.173	.208	.251	.833	.416	-.263	.609	.507	.193	.126
	CAUSE_4	.357	.242	.526	1.476	.157	-.151	.865	.452	.329	.223
	CAUSE_5	-.464	.200	-.665	-2.323	.032	-.884	-.044	.130	-.480	-.351
	CAUSE_6	.268	.134	.389	2.002	.061	-.013	.550	.343	.427	.302
	CAUSE_7	-.284	.169	-.366	-1.684	.109	-.639	.070	.314	-.369	-.254
	CAUSE_9	.333	.134	.502	2.482	.023	.051	.616	.582	.505	.375

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	2.826	1.046		2.701	.014	.636	5.015			
	CAUSE_4	.484	.186	.713	2.599	.018	.094	.874	.452	.512	.389
	CAUSE_5	-.463	.198	-.663	-2.337	.031	-.878	-.048	.130	-.472	-.350
	CAUSE_6	.304	.126	.441	2.415	.026	.040	.567	.343	.485	.362
	CAUSE_7	-.274	.167	-.352	-1.640	.117	-.623	.076	.314	-.352	-.246
	CAUSE_9	.338	.133	.510	2.542	.020	.060	.617	.582	.504	.381
9	(Constant)	2.084	.982		2.122	.047	.035	4.132			
	CAUSE_4	.389	.184	.573	2.111	.048	.005	.773	.452	.427	.329
	CAUSE_5	-.326	.187	-.467	-1.742	.097	-.717	.064	.130	-.363	-.272
	CAUSE_6	.224	.121	.325	1.852	.079	-.028	.476	.343	.383	.289
	CAUSE_9	.232	.121	.350	1.917	.070	-.020	.485	.582	.394	.299

Model		Tolerance	VIF
8	(Constant)		
	CAUSE_4	.298	3.357
	CAUSE_5	.279	3.590
	CAUSE_6	.672	1.489
	CAUSE_7	.486	2.058
	CAUSE_9	.558	1.794
9	(Constant)		
	CAUSE_4	.330	3.032
	CAUSE_5	.339	2.951
	CAUSE_6	.791	1.264
	CAUSE_9	.731	1.368

a. Dependent Variable: SCP4

SPSS regression printouts for SCP5 analysis

	CAUSE2	.351	.397	.139
	CAUSE3	.334	.356	.189
	CAUSE4	.478	.431	.159
	CAUSE5	.432	.324	.144
	CAUSE6	.287	.288	.294
	CAUSE7	.276	.487	.261
	CAUSE8	.448	.644	.405
	CAUSE9	.412	.636	.348
	CAUSE10	1.000	.582	.393
	CAUSE11	.582	1.000	.457
	CAUSE12	.393	.457	1.000
Sig. (1-tailed)	SCP5	.000	.000	.033
	CAUSE1	.000	.000	.000
	CAUSE2	.000	.000	.025
	CAUSE3	.000	.000	.004
	CAUSE4	.000	.000	.013
	CAUSE5	.000	.000	.022
	CAUSE6	.000	.000	.000
	CAUSE7	.000	.000	.000
	CAUSE8	.000	.000	.000
	CAUSE9	.000	.000	.000
	CAUSE10	.	.000	.000
	CAUSE11	.000	.	.000
	CAUSE12	.000	.000	.
N	SCP5	197	197	197
	CAUSE1	197	197	197
	CAUSE2	197	197	197
	CAUSE3	197	197	197
	CAUSE4	197	197	197
	CAUSE5	197	197	197
	CAUSE6	197	197	197
	CAUSE7	197	197	197
	CAUSE8	197	197	197
	CAUSE9	197	197	197
	CAUSE10	197	197	197
	CAUSE11	197	197	197
	CAUSE12	197	197	197

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4[a]	.	Enter
2	.	CAUSE4	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE6	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE1	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE9	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE8	Backward (criterion: Probability of F-to-remove >= .100).

	Mean	Std. Deviation	N
SCP5	5.201	1.5107	197
CAUSE1	6.127	1.9895	197
CAUSE2	5.561	1.9882	197
CAUSE3	5.660	1.9990	197
CAUSE4	5.652	2.0227	197
CAUSE5	5.510	1.9961	197
CAUSE6	5.117	1.9382	197
CAUSE7	5.272	2.0225	197
CAUSE8	6.170	1.9160	197
CAUSE9	6.297	2.1776	197
CAUSE10	5.939	1.7667	197
CAUSE11	5.338	2.0087	197
CAUSE12	5.599	1.9637	197

Correlations

		SCP5	CAUSE1	CAUSE2	CAUSE3	CAUSE4	CAUSE5	CAUSE6	CAUSE7	CAUSE8	CAUSE9
Pearson Correlation	SCP5	1.000	.238	.241	.338	.323	.322	.260	.335	.271	.278
	CAUSE1	.238	1.000	.758	.558	.554	.537	.500	.399	.465	.414
	CAUSE2	.241	.758	1.000	.624	.693	.583	.466	.419	.439	.337
	CAUSE3	.338	.558	.624	1.000	.641	.583	.468	.469	.372	.365
	CAUSE4	.323	.554	.693	.641	1.000	.732	.453	.425	.383	.306
	CAUSE5	.322	.537	.583	.583	.732	1.000	.554	.314	.368	.225
	CAUSE6	.260	.500	.466	.468	.453	.554	1.000	.501	.442	.361
	CAUSE7	.335	.399	.419	.469	.425	.314	.501	1.000	.566	.472
	CAUSE8	.271	.465	.439	.372	.383	.368	.442	.566	1.000	.634
	CAUSE9	.278	.414	.337	.365	.306	.225	.361	.472	.634	1.000
	CAUSE10	.379	.307	.351	.334	.478	.432	.287	.276	.448	.412
	CAUSE11	.332	.354	.397	.356	.431	.324	.288	.487	.644	.636
	CAUSE12	.132	.254	.139	.189	.159	.144	.294	.261	.405	.348
Sig. (1-tailed)	SCP5	.	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE5	.000	.000	.000	.000	.000	.	.000	.000	.000	.001
	CAUSE6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE9	.000	.000	.000	.000	.000	.001	.000	.000	.000	.
	CAUSE10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE12	.033	.000	.025	.004	.013	.022	.000	.000	.000	.000
N	SCP5	197	197	197	197	197	197	197	197	197	197
	CAUSE1	197	197	197	197	197	197	197	197	197	197
	CAUSE2	197	197	197	197	197	197	197	197	197	197
	CAUSE3	197	197	197	197	197	197	197	197	197	197
	CAUSE4	197	197	197	197	197	197	197	197	197	197
	CAUSE5	197	197	197	197	197	197	197	197	197	197
	CAUSE6	197	197	197	197	197	197	197	197	197	197
	CAUSE7	197	197	197	197	197	197	197	197	197	197
	CAUSE8	197	197	197	197	197	197	197	197	197	197
	CAUSE9	197	197	197	197	197	197	197	197	197	197
	CAUSE10	197	197	197	197	197	197	197	197	197	197
	CAUSE11	197	197	197	197	197	197	197	197	197	197
	CAUSE12	197	197	197	197	197	197	197	197	197	197

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	106.633	9	11.848	6.503	.000[d]
	Residual	340.697	187	1.822		
	Total	447.330	196			
5	Regression	106.145	8	13.268	7.311	.000[e]
	Residual	341.185	188	1.815		
	Total	447.330	196			
6	Regression	105.820	7	15.117	8.366	.000[f]
	Residual	341.510	189	1.807		
	Total	447.330	196			
7	Regression	104.035	6	17.339	9.596	.000[g]
	Residual	343.295	190	1.807		
	Total	447.330	196			
8	Regression	102.493	5	20.499	11.354	.000[h]
	Residual	344.837	191	1.805		
	Total	447.330	196			
9	Regression	100.458	4	25.114	13.901	.000[i]
	Residual	346.872	192	1.807		
	Total	447.330	196			
10	Regression	98.442	3	32.814	18.152	.000[j]
	Residual	348.888	193	1.808		
	Total	447.330	196			

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4

b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1

c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1

d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11

e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11

f. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE11

g. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5

h. Predictors: (Constant), CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5

i. Predictors: (Constant), CAUSE10, CAUSE7, CAUSE3, CAUSE5

j. Predictors: (Constant), CAUSE10, CAUSE7, CAUSE3

k. Dependent Variable: SCPS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	2.536	.446		5.687	.000	1.657	3.416			
	CAUSE1	2.549E-02	.082	.034	.312	.755	-.136	.187	.238	.023	.020
	CAUSE2	-9.293E-02	.090	-.122	-1.031	.304	-.271	.085	.241	-.076	-.066
	CAUSE3	.112	.071	.148	1.561	.120	-.029	.253	.338	.114	.100
	CAUSE4	-1.259E-02	.087	-.017	-.145	.885	-.184	.158	.323	-.011	-.009
	CAUSE5	8.956E-02	.082	.118	1.093	.276	-.072	.251	.322	.080	.070
	CAUSE6	1.468E-02	.070	.019	.209	.834	-.124	.153	.260	.015	.013
	CAUSE7	.140	.067	.187	2.086	.038	.008	.272	.335	.152	.134
	CAUSE8	-4.895E-02	.079	-.062	-.616	.538	-.206	.108	.271	-.045	-.040
	CAUSE9	2.656E-02	.066	.038	.404	.687	-.103	.156	.278	.030	.026
	CAUSE10	.216	.075	.252	2.895	.004	.069	.363	.379	.209	.186
	CAUSE11	7.403E-02	.079	.098	.932	.353	-.083	.231	.332	.069	.060
	CAUSE12	-6.824E-02	.060	-.089	-1.138	.257	-.187	.050	.132	-.084	-.073
2	(Constant)	2.537	.445		5.703	.000	1.659	3.414			
	CAUSE1	2.602E-02	.081	.034	.320	.750	-.135	.187	.238	.023	.020
	CAUSE2	-9.710E-02	.085	-.128	-1.139	.256	-.265	.071	.241	-.083	-.073
	CAUSE3	.110	.070	.145	1.567	.119	-.028	.248	.338	.114	.100
	CAUSE5	8.420E-02	.073	.111	1.155	.250	-.060	.228	.322	.085	.074
	CAUSE6	1.532E-02	.070	.020	.220	.826	-.122	.153	.260	.016	.014
	CAUSE7	.138	.066	.185	2.092	.038	.008	.269	.335	.152	.134
	CAUSE8	-4.777E-02	.079	-.061	-.606	.545	-.203	.108	.271	-.045	-.039
	CAUSE9	2.675E-02	.066	.039	.408	.684	-.103	.156	.278	.030	.026
	CAUSE10	.214	.073	.250	2.924	.004	.070	.358	.379	.210	.188
	CAUSE11	7.290E-02	.079	.097	.924	.357	-.083	.229	.332	.068	.059
	CAUSE12	-6.782E-02	.060	-.088	-1.135	.258	-.186	.050	.132	-.083	-.073
3	(Constant)	2.536	.444		5.716	.000	1.661	3.411			
	CAUSE1	2.755E-02	.081	.036	.340	.734	-.132	.187	.238	.025	.022
	CAUSE2	-9.660E-02	.085	-.127	-1.137	.257	-.264	.071	.241	-.083	-.073
	CAUSE3	.110	.070	.145	1.573	.117	-.029	.248	.338	.115	.101
	CAUSE5	8.992E-02	.068	.119	1.324	.187	-.044	.224	.322	.097	.085
	CAUSE7	.142	.063	.191	2.260	.025	.018	.267	.335	.163	.145
	CAUSE8	-4.653E-02	.078	-.059	-.593	.554	-.201	.108	.271	-.043	-.038
	CAUSE9	2.844E-02	.065	.041	.437	.662	-.100	.157	.278	.032	.028
	CAUSE10	.213	.073	.249	2.926	.004	.069	.357	.379	.210	.187
	CAUSE11	6.964E-02	.077	.093	.901	.369	-.083	.222	.332	.066	.058
	CAUSE12	-6.528E-02	.058	-.085	-1.117	.266	-.183	.050	.132	-.082	-.071

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE11	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE12	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE2	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE5	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCPS

M Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.489[a]	.239	.190	1.3601	.239	4.819	12	184	.000
2	.489[b]	.239	.194	1.3565	.000	.021	1	186	.885
3	.489[c]	.239	.198	1.3530	.000	.048	1	187	.826
4	.488[d]	.238	.202	1.3498	.000	.116	1	188	.734
5	.487[e]	.237	.205	1.3472	-.001	.268	1	189	.605
6	.486[f]	.237	.208	1.3442	-.001	.179	1	190	.673
7	.482[g]	.233	.208	1.3442	-.004	.988	1	191	.322
8	.479[h]	.229	.209	1.3437	-.003	.853	1	192	.357
9	.474[i]	.225	.208	1.3441	-.005	1.127	1	193	.290
10	.469[j]	.220	.208	1.3445	-.005	1.116	1	194	.292

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4

b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1

c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1

d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11

e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11

f. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE11

g. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5

h. Predictors: (Constant), CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5

i. Predictors: (Constant), CAUSE10, CAUSE7, CAUSE3, CAUSE5

j. Predictors: (Constant), CAUSE10, CAUSE7, CAUSE3

k. Dependent Variable: SCPS

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	106.973	12	8.914	4.819	.000[a]
	Residual	340.357	184	1.850		
	Total	447.330	196			
2	Regression	106.934	11	9.721	5.283	.000[b]
	Residual	340.396	185	1.840		
	Total	447.330	196			
3	Regression	106.845	10	10.684	5.837	.000[c]
	Residual	340.485	186	1.831		

Model		Tolerance	VIF
1	(Constant)		
	CAUSE1	.357	2.801
	CAUSE2	.294	3.403
	CAUSE3	.462	2.163
	CAUSE4	.307	3.258
	CAUSE5	.353	2.833
	CAUSE6	.511	1.958
	CAUSE7	.515	1.942
	CAUSE8	.407	2.459
	CAUSE9	.460	2.176
	CAUSE10	.545	1.836
	CAUSE11	.370	2.700
	CAUSE12	.681	1.469
2	(Constant)		
	CAUSE1	.358	2.796
	CAUSE2	.327	3.058
	CAUSE3	.480	2.085
	CAUSE5	.443	2.256
	CAUSE6	.513	1.950
	CAUSE7	.526	1.901
	CAUSE8	.411	2.433
	CAUSE9	.460	2.175
	CAUSE10	.563	1.778
	CAUSE11	.374	2.674
	CAUSE12	.682	1.466
3	(Constant)		
	CAUSE1	.360	2.775
	CAUSE2	.327	3.056
	CAUSE3	.480	2.084
	CAUSE5	.508	1.967
	CAUSE7	.575	1.740
	CAUSE8	.413	2.421
	CAUSE9	.466	2.145
	CAUSE10	.563	1.776
	CAUSE11	.388	2.580
	CAUSE12	.709	1.411

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE2	.497	2.012
	CAUSE3	.481	2.078
	CAUSE5	.522	1.915
	CAUSE7	.575	1.740
	CAUSE8	.416	2.403
	CAUSE9	.486	2.059
	CAUSE10	.567	1.765
	CAUSE11	.396	2.528
	CAUSE12	.735	1.361
5	(Constant)		
	CAUSE2	.497	2.011
	CAUSE3	.493	2.030
	CAUSE5	.533	1.875
	CAUSE7	.578	1.730
	CAUSE8	.465	2.150
	CAUSE10	.568	1.760
	CAUSE11	.437	2.288
	CAUSE12	.735	1.361
6	(Constant)		
	CAUSE2	.506	1.975
	CAUSE3	.495	2.021
	CAUSE5	.537	1.861
	CAUSE7	.648	1.543
	CAUSE10	.570	1.755
	CAUSE11	.497	2.011
	CAUSE12	.754	1.326
7	(Constant)		
	CAUSE2	.517	1.933
	CAUSE3	.495	2.021
	CAUSE5	.538	1.858
	CAUSE7	.722	1.384
	CAUSE10	.690	1.449
	CAUSE12	.813	1.230

Analysis for Ca-SCP5-AR

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	2.552	.440		5.797	.000	1.684	3.420			
	CAUSE2	-7.969E-02	.069	-.105	-1.159	.248	-.215	.056	.241	-.084	-.074
	CAUSE3	.111	.070	.147	1.598	.112	-.026	.248	.338	.116	.102
	CAUSE5	9.366E-02	.067	.124	1.401	.163	-.038	.226	.322	.102	.089
	CAUSE7	.142	.063	.191	2.264	.025	.018	.266	.335	.163	.144
	CAUSE8	-4.422E-02	.078	-.056	-.567	.571	-.198	.109	.271	-.041	-.036
	CAUSE9	3.288E-02	.064	.047	.517	.605	-.092	.158	.278	.038	.033
	CAUSE10	.211	.072	.247	2.915	.004	.068	.354	.379	.208	.185
	CAUSE11	6.590E-02	.076	.083	.864	.389	-.085	.216	.332	.063	.055
	CAUSE12	-6.153E-02	.057	-.080	-1.074	.284	-.175	.051	.132	-.078	-.069
5	(Constant)	2.587	.434		5.957	.000	1.730	3.443			
	CAUSE2	-8.021E-02	.069	-.106	-1.169	.244	-.216	.055	.241	-.085	-.074
	CAUSE3	.117	.069	.154	1.701	.091	-.019	.252	.338	.123	.108
	CAUSE5	8.865E-02	.066	.117	1.343	.181	-.042	.219	.322	.097	.086
	CAUSE7	.145	.063	.194	2.315	.022	.021	.268	.335	.166	.147
	CAUSE8	-3.113E-02	.074	-.040	-.423	.673	-.176	.114	.271	-.031	-.027
	CAUSE10	.213	.072	.249	2.952	.004	.071	.356	.379	.210	.188
	CAUSE11	7.805E-02	.072	.104	1.077	.283	-.065	.221	.332	.078	.069
	CAUSE12	-6.130E-02	.057	-.080	-1.072	.285	-.174	.051	.132	-.078	-.068
6	(Constant)	2.553	.426		5.993	.000	1.713	3.393			
	CAUSE2	-8.413E-02	.068	-.111	-1.240	.217	-.218	.050	.241	-.090	-.079
	CAUSE3	.119	.068	.157	1.735	.084	-.016	.253	.338	.125	.110
	CAUSE5	8.623E-02	.066	.114	1.314	.190	-.043	.216	.322	.095	.084
	CAUSE7	.136	.059	.182	2.309	.022	.020	.252	.335	.166	.147
	CAUSE10	.212	.072	.247	2.940	.004	.070	.354	.379	.209	.187
	CAUSE11	6.738E-02	.068	.090	.994	.322	-.066	.201	.332	.072	.063
	CAUSE12	-6.515E-02	.056	-.085	-1.157	.249	-.176	.046	.132	-.084	-.074
7	(Constant)	2.518	.424		5.931	.000	1.680	3.355			
	CAUSE2	-7.431E-02	.067	-.098	-1.107	.270	-.207	.058	.241	-.080	-.070
	CAUSE3	.118	.068	.156	1.722	.087	-.017	.252	.338	.124	.109
	CAUSE5	8.349E-02	.066	.110	1.273	.204	-.046	.213	.322	.092	.081
	CAUSE7	.155	.056	.207	2.774	.006	.045	.265	.335	.197	.176
	CAUSE10	.241	.065	.282	3.691	.000	.112	.371	.379	.259	.235
	CAUSE12	-5.008E-02	.054	-.065	-.934	.352	-.152	.057	.132	-.067	-.059

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	2.387	.400		5.965	.000	1.598	3.177			
	CAUSE2	-7.117E-02	.067	-.094	-1.062	.290	-.203	.061	.241	-.077	-.067
	CAUSE3	.114	.068	.152	1.680	.095	-.020	.249	.338	.121	.107
	CAUSE5	8.715E-02	.065	.115	1.332	.184	-.042	.216	.322	.096	.085
	CAUSE7	.146	.055	.196	2.658	.009	.038	.255	.335	.189	.169
	CAUSE10	.220	.061	.258	3.596	.000	.100	.341	.379	.252	.228
9	(Constant)	2.335	.397		5.877	.000	1.551	3.118			
	CAUSE3	8.882E-02	.064	.118	1.393	.165	-.037	.215	.338	.100	.089
	CAUSE5	6.577E-02	.062	.087	1.056	.292	-.057	.189	.322	.076	.067
	CAUSE7	.137	.054	.183	2.517	.013	.030	.244	.335	.179	.160
	CAUSE10	.216	.061	.252	3.524	.001	.095	.336	.379	.246	.224
10	(Constant)	2.394	.393		6.087	.000	1.619	3.170			
	CAUSE3	.121	.056	.160	2.158	.032	.010	.231	.338	.153	.137
	CAUSE7	.137	.054	.184	2.529	.012	.030	.245	.335	.179	.161
	CAUSE10	.235	.058	.275	4.038	.000	.120	.350	.379	.279	.257

Analysis for Ca-SCP5-AR

Correlations

		SCP5	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP5	1.000	.125	.179	.331	.234	.284	.061	.278	.243	.258
	CAUSE_1	.125	1.000	.850	.628	.625	.540	.224	.433	.436	.416
	CAUSE_2	.179	.850	1.000	.622	.759	.595	.164	.564	.530	.543
	CAUSE_3	.331	.628	.622	1.000	.598	.633	.211	.426	.379	.350
	CAUSE_4	.234	.625	.759	.598	1.000	.785	.285	.548	.447	.549
	CAUSE_5	.284	.540	.595	.633	.785	1.000	.274	.378	.389	.396
	CAUSE_6	.061	.224	.164	.211	.285	.274	1.000	.282	.234	.159
	CAUSE_7	.278	.433	.564	.426	.548	.378	.282	1.000	.694	.552
	CAUSE_8	.243	.436	.530	.379	.447	.389	.234	.694	1.000	.784
	CAUSE_9	.258	.416	.543	.350	.549	.396	.159	.552	.784	1.000
	CAUSE_10	.319	.253	.309	.185	.359	.327	.086	.393	.664	.694
	CAUSE_11	.220	.341	.456	.217	.400	.340	.044	.524	.797	.760
	CAUSE_12	-.071	.248	.108	.092	.088	.168	.099	.110	.396	.372
Sig. (1-tailed)	SCP5	.	.182	.096	.007	.043	.018	.330	.020	.037	.029
	CAUSE_1	.182	.	.000	.000	.000	.000	.050	.000	.000	.001
	CAUSE_2	.096	.000	.	.000	.000	.000	.116	.000	.000	.000
	CAUSE_3	.007	.000	.000	.	.000	.000	.061	.001	.002	.004
	CAUSE_4	.043	.000	.000	.000	.	.000	.017	.000	.000	.000
	CAUSE_5	.018	.000	.000	.000	.000	.	.022	.002	.002	.001
	CAUSE_6	.330	.050	.116	.061	.017	.022	.	.019	.043	.123
	CAUSE_7	.020	.000	.000	.001	.000	.002	.019	.	.000	.000
	CAUSE_8	.037	.000	.000	.002	.000	.002	.043	.000	.	.000
	CAUSE_9	.029	.001	.000	.004	.000	.001	.123	.000	.000	.
	CAUSE_10	.009	.031	.011	.088	.004	.007	.267	.001	.000	.000
	CAUSE_11	.053	.005	.000	.056	.001	.006	.375	.000	.000	.000
	CAUSE_12	.303	.034	.217	.251	.263	.110	.236	.212	.001	.003
N	SCP5	55	55	55	55	55	55	55	55	55	55
	CAUSE_1	55	55	55	55	55	55	55	55	55	55
	CAUSE_2	55	55	55	55	55	55	55	55	55	55
	CAUSE_3	55	55	55	55	55	55	55	55	55	55
	CAUSE_4	55	55	55	55	55	55	55	55	55	55
	CAUSE_5	55	55	55	55	55	55	55	55	55	55
	CAUSE_6	55	55	55	55	55	55	55	55	55	55
	CAUSE_7	55	55	55	55	55	55	55	55	55	55
	CAUSE_8	55	55	55	55	55	55	55	55	55	55
	CAUSE_9	55	55	55	55	55	55	55	55	55	55
	CAUSE_10	55	55	55	55	55	55	55	55	55	55
	CAUSE_11	55	55	55	55	55	55	55	55	55	55
	CAUSE_12	55	55	55	55	55	55	55	55	55	55

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP5	.319	.220	-.071
	CAUSE_1	.253	.341	.248
	CAUSE_2	.309	.456	.108
	CAUSE_3	.185	.217	.092
	CAUSE_4	.359	.400	.088
	CAUSE_5	.327	.340	.168
	CAUSE_6	.086	.044	.099
	CAUSE_7	.393	.524	.110
	CAUSE_8	.664	.797	.396
	CAUSE_9	.694	.760	.372
	CAUSE_10	1.000	.724	.544
	CAUSE_11	.724	1.000	.370
	CAUSE_12	.544	.370	1.000
Sig. (1-tailed)	SCP5	.009	.053	.303
	CAUSE_1	.031	.005	.034
	CAUSE_2	.011	.000	.217
	CAUSE_3	.088	.056	.251
	CAUSE_4	.004	.001	.263
	CAUSE_5	.007	.006	.110
	CAUSE_6	.267	.375	.236
	CAUSE_7	.001	.000	.212
	CAUSE_8	.000	.000	.001
	CAUSE_9	.000	.000	.003
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.003
	CAUSE_12	.000	.003	.
N	SCP5	55	55	55
	CAUSE_1	55	55	55
	CAUSE_2	55	55	55
	CAUSE_3	55	55	55
	CAUSE_4	55	55	55
	CAUSE_5	55	55	55
	CAUSE_6	55	55	55
	CAUSE_7	55	55	55
	CAUSE_8	55	55	55
	CAUSE_9	55	55	55
	CAUSE_10	55	55	55

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE2	.519	1.928
	CAUSE3	.496	2.016
	CAUSE5	.540	1.851
	CAUSE7	.743	1.346
	CAUSE10	.785	1.274
9	(Constant)		
	CAUSE3	.567	1.762
	CAUSE5	.597	1.675
	CAUSE7	.764	1.309
	CAUSE10	.789	1.267
10	(Constant)		
	CAUSE3	.735	1.361
	CAUSE7	.764	1.309
	CAUSE10	.870	1.149

a. Dependent Variable: SCP5

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP5	5.409	1.7054	55
CAUSE_1	5.391	2.2396	55
CAUSE_2	5.464	2.1897	55
CAUSE_3	5.400	2.2307	55
CAUSE_4	5.764	2.4092	55
CAUSE_5	5.500	2.2812	55
CAUSE_6	5.655	9.0615	55
CAUSE_7	4.600	2.4578	55
CAUSE_8	5.482	2.2770	55
CAUSE_9	4.809	2.1398	55
CAUSE_10	6.400	1.9940	55
CAUSE_11	4.891	2.3935	55
CAUSE_12	5.245	2.2564	55

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.549[a]	.302	.102	1.6160	.302	1.511	12	42	.158
2	.549[b]	.302	.123	1.5971	.000	.000	1	44	.996
3	.549[c]	.301	.142	1.5792	.000	.021	1	45	.884
4	.548[d]	.300	.160	1.5630	-.001	.080	1	46	.779
5	.546[e]	.298	.176	1.5481	-.002	.128	1	47	.722
6	.543[f]	.295	.190	1.5350	-.003	.204	1	48	.653
7	.537[g]	.288	.199	1.5264	-.007	.466	1	49	.498
8	.532[h]	.284	.210	1.5154	-.004	.292	1	50	.592
9	.527[i]	.278	.220	1.5059	-.006	.378	1	51	.541
10	.511[j]	.261	.218	1.5082	-.017	1.158	1	52	.287

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2

f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_2

g. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_2

h. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_2

i. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_10, CAUSE_2

j. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_10

k. Dependent Variable: SCP5

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.363	12	3.947	1.511	.158[a]
	Residual	109.682	42	2.611		
	Total	157.045	54			
2	Regression	47.363	11	4.306	1.688	.109[b]
	Residual	109.682	43	2.551		
	Total	157.045	54			
3	Regression	47.308	10	4.731	1.897	.071[c]
	Residual	109.737	44	2.494		
	Total	157.045	54			

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	47.109	9	5.234	2.143	.045[d]
	Residual	109.937	45	2.443		
	Total	157.045	54			
5	Regression	46.795	8	5.849	2.441	.027[e]
	Residual	110.250	46	2.397		
	Total	157.045	54			
6	Regression	46.305	7	6.615	2.808	.016[f]
	Residual	110.740	47	2.356		
	Total	157.045	54			
7	Regression	45.207	6	7.534	3.234	.009[g]
	Residual	111.839	48	2.330		
	Total	157.045	54			
8	Regression	44.527	5	8.905	3.878	.005[h]
	Residual	112.518	49	2.296		
	Total	157.045	54			
9	Regression	43.659	4	10.915	4.813	.002[i]
	Residual	113.386	50	2.268		
	Total	157.045	54			
10	Regression	41.033	3	13.678	6.013	.001[j]
	Residual	116.012	51	2.275		
	Total	157.045	54			

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

d. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

e. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2

f. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_2

g. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_5, CAUSE_2

h. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_2

i. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_10, CAUSE_2

j. Predictors: (Constant), CAUSE_12, CAUSE_3, CAUSE_10

k. Dependent Variable: SCP5

Analysis for Ca-SCP5-MC

Model	Entered	Removed	Method
1	CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2[a]	.	Enter
2	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP5-MC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP5

Analysis for Ca-SCP5-MC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
8	(Constant)	3.304	.817		4.044	.000	1.662	4.946			
	CAUSE_2	-.163	.134	-.209	-1.219	.229	-.432	.106	.179	-.172	-.147
	CAUSE_3	.280	.119	.366	2.351	.023	.041	.520	.331	.318	.284
	CAUSE_7	6.603E-02	.107	.095	.615	.541	-.150	.282	.278	.088	.074
	CAUSE_10	.399	.135	.466	2.945	.005	.127	.671	.319	.388	.356
	CAUSE_12	-.262	.110	-.346	-2.378	.021	-.483	-.041	-.071	-.322	-.288
9	(Constant)	3.277	.811		4.042	.000	1.649	4.906			
	CAUSE_2	-.133	.124	-.171	-1.076	.287	-.382	.116	.179	-.150	-.129
	CAUSE_3	.290	.117	.379	2.466	.017	.054	.525	.331	.329	.296
	CAUSE_10	.424	.128	.495	3.300	.002	.166	.682	.319	.423	.397
	CAUSE_12	-.270	.109	-.357	-2.484	.016	-.488	-.052	-.071	-.331	-.298
10	(Constant)	3.136	.801		3.914	.000	1.528	4.745			
	CAUSE_3	.213	.094	.279	2.276	.027	.025	.401	.331	.304	[illegible]
	CAUSE_10	.388	.124	.454	3.123	.003	.139	.638	.319	.401	[illegible]
	CAUSE_12	-.260	.108	-.344	-2.396	.020	-.477	-.042	-.071	-.318	[illegible]

Coefficients[a]

Model		Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.150	6.668
	CAUSE_3	.440	2.272
	CAUSE_4	.195	5.125
	CAUSE_5	.299	3.343
	CAUSE_6	.783	1.277
	CAUSE_7	.394	2.541
	CAUSE_8	.187	5.351
	CAUSE_9	.257	3.897
	CAUSE_10	.337	2.964
	CAUSE_11	.250	3.995
	CAUSE_12	.568	1.761
2	(Constant)		
	CAUSE_2	.319	3.138
	CAUSE_3	.467	2.141
	CAUSE_4	.196	5.107
	CAUSE_5	.299	3.342
	CAUSE_6	.804	1.243
	CAUSE_7	.396	2.527
	CAUSE_8	.187	5.349
	CAUSE_9	.259	3.857
	CAUSE_10	.339	2.954
	CAUSE_11	.250	3.994
	CAUSE_12	.644	1.554
3	(Constant)		
	CAUSE_2	.325	3.081
	CAUSE_3	.467	2.140
	CAUSE_4	.199	5.019
	CAUSE_5	.301	3.318
	CAUSE_7	.401	2.492
	CAUSE_8	.194	5.155
	CAUSE_9	.259	3.857
	CAUSE_10	.340	2.945
	CAUSE_11	.262	3.820
	CAUSE_12	[illegible]	[illegible]

Analysis for Ca-SCP5-MC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	3.237	.903		3.585	.001	1.415	5.059			
	CAUSE_1	-1.051E-03	.213	-.001	-.005	.996	-.430	.428	.125	-.001	-.001
	CAUSE_2	-.114	.259	-.146	-.438	.664	-.637	.410	.179	-.067	-.056
	CAUSE_3	.239	.149	.313	1.611	.115	-.060	.539	.331	.241	.208
	CAUSE_4	-.162	.207	-.229	-.785	.437	-.579	.255	.234	-.120	-.101
	CAUSE_5	.161	.176	.216	.916	.365	-.194	.517	.284	.140	.118
	CAUSE_6	-3.887E-03	.027	-.021	-.142	.888	-.059	.051	.061	-.022	-.018
	CAUSE_7	.125	.143	.180	.875	.386	-.163	.413	.278	.134	.113
	CAUSE_8	-8.128E-02	.223	-.109	-.364	.718	-.532	.370	.243	-.056	-.047
	CAUSE_9	8.083E-02	.203	.101	.398	.692	-.329	.490	.258	.061	.051
	CAUSE_10	.428	.190	.500	2.252	.030	.044	.811	.319	.328	.290
	CAUSE_11	-5.518E-02	.184	-.077	-.300	.765	-.426	.315	.220	-.046	[illegible]
	CAUSE_12	-.269	.129	-.356	-2.080	.044	-.530	-.008	-.071	-.306	[illegible]
2	(Constant)	3.237	.892		3.628	.001	1.437	5.036			
	CAUSE_2	-.115	.176	-.147	-.651	.518	-.469	.240	.179	-.099	[illegible]
	CAUSE_3	.239	.143	.313	1.679	.100	-.048	.527	.331	.248	[illegible]
	CAUSE_4	-.162	.204	-.229	-.795	.431	-.573	.249	.234	-.120	[illegible]
	CAUSE_5	.162	.174	.216	.927	.359	-.190	.513	.284	.140	[illegible]
	CAUSE_6	-3.909E-03	.027	-.021	-.146	.884	-.058	.050	.061	-.022	[illegible]
	CAUSE_7	.125	.141	.180	.888	.379	-.159	.408	.278	.134	[illegible]
	CAUSE_8	-8.125E-02	.221	-.108	-.368	.715	-.526	.364	.243	-.056	[illegible]
	CAUSE_9	8.094E-02	.199	.102	.406	.687	-.321	.483	.258	.062	[illegible]
	CAUSE_10	.428	.187	.500	2.283	.027	.050	.806	.319	.329	[illegible]
	CAUSE_11	-5.519E-02	.181	-.077	-.304	.763	-.421	.311	.220	-.046	-.039
	CAUSE_12	-.269	.120	-.356	-2.242	.030	-.511	-.027	-.071	-.324	-.286
3	(Constant)	3.242	.881		3.678	.001	1.466	5.019			
	CAUSE_2	-.111	.172	-.143	-.645	.523	-.458	.236	.179	-.097	-.081
	CAUSE_3	.240	.141	.314	1.702	.096	-.044	.524	.331	.248	.214
	CAUSE_4	-.166	.200	-.235	-.831	.411	-.569	.237	.234	-.124	-.105
	CAUSE_5	.159	.172	.213	.929	.358	-.186	.505	.284	.139	.117
	CAUSE_7	.122	.138	.177	.887	.380	-.156	.401	.278	.133	.112
	CAUSE_8	-8.739E-02	.214	-.117	-.408	.685	-.519	.344	.243	-.061	-.051
	CAUSE_9	8.106E-02	.197	.102	.411	.683	-.316	.479	.258	.062	.052
	CAUSE_10	.429	.185	.502	2.320	.025	.056	.802	.319	.330	.292
	CAUSE_11	-4.965E-02	.175	-.070	-.283	.779	-.403	.304	.220	-.043	-.036
	CAUSE_12	-.271	.118	-.358	-2.287	.027	-.509	-.032	-.071	-.326	-.288

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	3.275	.865		3.787	.000	1.534	5.017			
	CAUSE_2	-.118	.169	-.152	-.703	.486	-.458	.221	.179	-.104	-.088
	CAUSE_3	.248	.136	.325	1.822	.075	-.026	.523	.331	.262	.227
	CAUSE_4	-.161	.197	-.227	-.817	.418	-.558	.236	.234	-.121	-.102
	CAUSE_5	.155	.169	.207	.915	.365	-.186	.495	.284	.135	.114
	CAUSE_7	.123	.137	.177	.901	.372	-.152	.398	.278	.133	.112
	CAUSE_8	-.111	.196	-.148	-.566	.574	-.505	.283	.243	-.084	-.071
	CAUSE_9	6.802E-02	.190	.085	.358	.722	-.314	.450	.258	.053	.045
	CAUSE_10	.412	.172	.481	2.388	.021	.064	.759	.319	.335	.298
	CAUSE_12	-.267	.117	-.354	-2.294	.027	-.502	-.033	-.071	-.324	-.286
5	(Constant)	3.223	.844		3.817	.000	1.524	4.923			
	CAUSE_2	-.114	.167	-.147	-.686	.496	-.449	.221	.179	-.101	[illegible]
	CAUSE_3	.248	.135	.325	1.840	.072	-.023	.520	.331	.262	[illegible]
	CAUSE_4	-.139	.186	-.196	-.749	.457	-.513	.234	.234	-.110	[illegible]
	CAUSE_5	.142	.164	.190	.868	.390	-.188	.472	.284	.127	[illegible]
	CAUSE_7	.118	.134	.169	.874	.386	-.153	.388	.278	.128	[illegible]
	CAUSE_8	-7.639E-02	.169	-.102	-.452	.653	-.417	.264	.243	-.066	[illegible]
	CAUSE_10	.432	.161	.505	2.686	.010	.108	.756	.319	.368	[illegible]
	CAUSE_12	-.267	.115	-.353	-2.311	.025	-.499	-.034	-.071	-.323	[illegible]
6	(Constant)	3.278	.829		3.956	.000	1.611	4.945			
	CAUSE_2	-.132	.160	-.170	-.825	.413	-.455	.190	.179	-.120	[illegible]
	CAUSE_3	.246	.134	.321	1.838	.072	-.023	.515	.331	.259	[illegible]
	CAUSE_4	-.123	.181	-.174	-.683	.498	-.487	.240	.234	-.099	[illegible]
	CAUSE_5	.136	.162	.182	.842	.404	-.189	.462	.284	.122	.103
	CAUSE_7	8.407E-02	.111	.121	.756	.454	-.140	.308	.278	.110	.093
	CAUSE_10	.398	.140	.465	2.832	.007	.115	.680	.319	.382	.347
	CAUSE_12	-.275	.113	-.364	-2.434	.019	-.502	-.048	-.071	-.335	-.298
7	(Constant)	3.282	.824		3.983	.000	1.625	4.939			
	CAUSE_2	-.184	.140	-.237	-1.313	.195	-.466	.098	.179	-.186	-.160
	CAUSE_3	.249	.133	.326	1.878	.067	-.018	.517	.331	.262	.229
	CAUSE_5	6.897E-02	.128	.092	.540	.592	-.188	.326	.284	.078	.066
	CAUSE_7	6.853E-02	.108	.099	.633	.530	-.149	.286	.278	.091	.077
	CAUSE_10	.386	.139	.451	2.785	.008	.107	.664	.319	.373	.339
	CAUSE_12	-.263	.111	-.347	-2.368	.022	-.486	-.040	-.071	-.323	-.288

	Mean	Std. Deviation	N
SCP5	5.064	1.3448	117
CAUSE_1	6.329	1.6945	117
CAUSE_2	5.368	1.7731	117
CAUSE_3	5.581	1.7665	117
CAUSE_4	5.350	1.6417	117
CAUSE_5	5.261	1.6976	117
CAUSE_6	5.171	1.7034	117
CAUSE_7	5.500	1.7145	117
CAUSE_8	6.444	1.6697	117
CAUSE_9	7.162	1.6646	117
CAUSE_10	5.615	1.5134	117
CAUSE_11	5.551	1.6287	117
CAUSE_12	5.765	1.7039	117

Correlations

		SCP5	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP5	1.000	.264	.197	.402	.371	.439	.400	.475	.283	.404
	CAUSE_1	.264	1.000	.662	.486	.432	.520	.496	.329	.453	.384
	CAUSE_2	.197	.662	1.000	.607	.561	.516	.445	.355	.402	.390
	CAUSE_3	.402	.486	.607	1.000	.624	.565	.566	.500	.319	.473
	CAUSE_4	.371	.432	.561	.624	1.000	.644	.472	.420	.395	.386
	CAUSE_5	.439	.520	.516	.565	.644	1.000	.654	.405	.446	.376
	CAUSE_6	.400	.496	.445	.566	.472	.654	1.000	.481	.417	.464
	CAUSE_7	.475	.329	.355	.500	.420	.405	.481	1.000	.416	.331
	CAUSE_8	.283	.453	.402	.319	.395	.446	.417	.416	1.000	.478
	CAUSE_9	.404	.384	.390	.473	.386	.376	.464	.331	.478	1.000
	CAUSE_10	.311	.331	.265	.394	.487	.492	.348	.229	.339	.502
	CAUSE_11	.332	.288	.386	.406	.495	.429	.356	.418	.483	.537
	CAUSE_12	.167	.199	.112	.218	.237	.238	.278	.292	.350	.289
Sig. (1-tailed)	SCP5	.	.002	.017	.000	.000	.000	.000	.000	.001	.000
	CAUSE_1	.002	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_2	.017	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE_4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE_5	.000	.000	.000	.000	.000	.	.000	.000	.000	.000
	CAUSE_6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE_7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE_8	.001	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE_9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.
	CAUSE_10	.000	.000	.002	.000	.000	.000	.000	.006	.000	.000
	CAUSE_11	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_12	.036	.016	.114	.009	.005	.005	.001	.001	.000	.001
N	SCP5	117	117	117	117	117	117	117	117	117	117
	CAUSE_1	117	117	117	117	117	117	117	117	117	117
	CAUSE_2	117	117	117	117	117	117	117	117	117	117
	CAUSE_3	117	117	117	117	117	117	117	117	117	117
	CAUSE_4	117	117	117	117	117	117	117	117	117	117
	CAUSE_5	117	117	117	117	117	117	117	117	117	117
	CAUSE_6	117	117	117	117	117	117	117	117	117	117
	CAUSE_7	117	117	117	117	117	117	117	117	117	117
	CAUSE_8	117	117	117	117	117	117	117	117	117	117
	CAUSE_9	117	117	117	117	117	117	117	117	117	117
	CAUSE_10	117	117	117	117	117	117	117	117	117	117
	CAUSE_11	117	117	117	117	117	117	117	117	117	117
	CAUSE_12	117	117	117	117	117	117	117	117	117	117

Analysis for Ca-SCP5-SC

Model		Tolerance	VIF
4	(Constant)		
	CAUSE_2	.332	3.010
	CAUSE_3	.490	2.042
	CAUSE_4	.201	4.977
	CAUSE_5	.304	3.285
	CAUSE_7	.401	2.492
	CAUSE_8	.228	4.390
	CAUSE_9	.274	3.646
	CAUSE_10	.383	2.610
	CAUSE_12	.654	1.529
5	(Constant)		
	CAUSE_2	.334	2.995
	CAUSE_3	.490	2.042
	CAUSE_4	.222	4.502
	CAUSE_5	.318	3.148
	CAUSE_7	.407	2.460
	CAUSE_8	.300	3.336
	CAUSE_10	.431	2.319
	CAUSE_12	.654	1.529
6	(Constant)		
	CAUSE_2	.354	2.824
	CAUSE_3	.491	2.038
	CAUSE_4	.230	4.345
	CAUSE_5	.320	3.129
	CAUSE_7	.584	1.713
	CAUSE_10	.557	1.795
	CAUSE_12	.671	1.490
7	(Constant)		
	CAUSE_2	.457	2.188
	CAUSE_3	.491	2.035
	CAUSE_5	.508	1.967
	CAUSE_7	.609	1.641
	CAUSE_10	.565	1.768
	CAUSE_12	.689	1.451

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.496	2.017
	CAUSE_3	.602	1.662
	CAUSE_7	.610	1.638
	CAUSE_10	.583	1.715
	CAUSE_12	.689	1.451
9	(Constant)		
	CAUSE_2	.570	1.754
	CAUSE_3	.612	1.634
	CAUSE_10	.640	1.562
	CAUSE_12	.699	1.431
10	(Constant)		
	CAUSE_3	.966	1.036
	CAUSE_10	.686	1.458
	CAUSE_12	.704	1.420

a. Dependent Variable: SCP5

Analysis for Ca-SCP5-MC

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP5	.311	.332	.167
	CAUSE_1	.331	.288	.199
	CAUSE_2	.265	.386	.112
	CAUSE_3	.394	.406	.218
	CAUSE_4	.487	.495	.237
	CAUSE_5	.492	.429	.238
	CAUSE_6	.348	.356	.278
	CAUSE_7	.229	.418	.292
	CAUSE_8	.339	.483	.350
	CAUSE_9	.502	.537	.289
	CAUSE_10	1.000	.506	.349
	CAUSE_11	.506	1.000	.392
	CAUSE_12	.349	.392	1.000
Sig. (1-tailed)	SCP5	.000	.000	.036
	CAUSE_1	.000	.001	.016
	CAUSE_2	.002	.000	.114
	CAUSE_3	.000	.000	.009
	CAUSE_4	.000	.000	.005
	CAUSE_5	.000	.000	.005
	CAUSE_6	.000	.000	.001
	CAUSE_7	.006	.000	.001
	CAUSE_8	.000	.000	.000
	CAUSE_9	.000	.000	.001
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.000
	CAUSE_12	.000	.000	.
N	SCP5	117	117	117
	CAUSE_1	117	117	117
	CAUSE_2	117	117	117
	CAUSE_3	117	117	117
	CAUSE_4	117	117	117
	CAUSE_5	117	117	117
	CAUSE_6	117	117	117
	CAUSE_7	117	117	117
	CAUSE_8	117	117	117
	CAUSE_9	117	117	117
	CAUSE_10	117	117	117
	CAUSE_11	117	117	117
	CAUSE_12	117	117	117

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5[a]	.	Enter
2	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100)

a. All requested variables entered.

b. Dependent Variable: SCP5

Model Summary[j]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.608[a]	.370	.297	1.1272	.370	5.092	12	104	.000
2	.608[b]	.370	.304	1.1218	.000	.000	1	106	.999
3	.608[c]	.370	.311	1.1165	.000	.000	1	107	.990
4	.608[d]	.370	.317	1.1114	.000	.033	1	108	.855
5	.607[e]	.369	.322	1.1071	-.001	.165	1	109	.685
6	.606[f]	.368	.327	1.1030	-.001	.193	1	110	.661
7	.605[g]	.366	.331	1.0995	-.002	.301	1	111	.584
8	.602[h]	.362	.334	1.0976	-.004	.617	1	112	.434
9	.597[i]	.356	.333	1.0980	-.006	1.083	1	113	.300

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_4, CAUSE_3, CAUSE_5

g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_3, CAUSE_5

h. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_3, CAUSE_5

i. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_5

j. Dependent Variable: SCP5

Analysis for Ca-SCP5-SC

Analysis for Ca-SCP5-SC

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
4	(Constant)	1.745	.570		3.058	.003	.614	2.876			
	CAUSE_1	4.344E-02	.087	.055	.498	.619	-.129	.216	.264	.048	.038
	CAUSE_2	-.191	.090	-.251	-2.120	.036	-.369	-.012	.197	-.201	-.163
	CAUSE_3	6.843E-02	.090	.090	.758	.450	-.110	.247	.402	.073	.058
	CAUSE_4	5.623E-02	.093	.069	.603	.548	-.129	.241	.371	.058	.046
	CAUSE_5	.202	.088	.255	2.300	.023	.028	.376	.439	.217	.176
	CAUSE_7	.253	.074	.323	3.415	.001	.106	.400	.475	.313	.262
	CAUSE_8	-3.302E-02	.081	-.041	-.407	.685	-.194	.128	.283	-.039	-.031
	CAUSE_9	.200	.077	.248	2.597	.011	.047	.353	.404	.244	.199
	CAUSE_12	-5.069E-02	.067	-.064	-.757	.451	-.183	.082	.167	-.073	-.058
5	(Constant)	1.717	.564		3.043	.003	.599	2.836			
	CAUSE_1	3.765E-02	.086	.047	.440	.661	-.132	.207	.264	.042	[illegible]
	CAUSE_2	-.194	.089	-.256	-2.173	.032	-.371	-.017	.197	-.205	[illegible]
	CAUSE_3	7.573E-02	.088	.099	.860	.392	-.099	.250	.402	.052	[illegible]
	CAUSE_4	5.386E-02	.093	.066	.581	.562	-.130	.238	.371	.056	[illegible]
	CAUSE_5	.197	.087	.248	2.273	.025	.025	.368	.439	.214	[illegible]
	CAUSE_7	.247	.072	.315	3.422	.001	.104	.390	.475	.313	[illegible]
	CAUSE_9	.191	.073	.237	2.602	.011	.046	.337	.404	.243	[illegible]
	CAUSE_12	-5.582E-02	.066	-.071	-.852	.396	-.186	.074	.167	-.082	[illegible]
6	(Constant)	1.778	.545		3.262	.001	.698	2.858			
	CAUSE_2	-.175	.078	-.231	-2.249	.027	-.329	-.021	.197	-.211	[illegible]
	CAUSE_3	7.645E-02	.088	.100	.871	.386	-.097	.250	.402	.083	[illegible]
	CAUSE_4	5.050E-02	.092	.062	.549	.584	-.132	.233	.371	.052	.042
	CAUSE_5	.205	.084	.259	2.449	.016	.039	.372	.439	.228	.187
	CAUSE_7	.248	.072	.316	3.448	.001	.105	.390	.475	.314	.263
	CAUSE_9	.194	.073	.241	2.671	.009	.050	.339	.404	.248	.203
	CAUSE_12	-5.327E-02	.065	-.068	-.819	.414	-.182	.076	.167	-.078	-.062
7	(Constant)	1.804	.541		3.334	.001	.732	2.877			
	CAUSE_2	-.166	.076	-.219	-2.190	.031	-.317	-.016	.197	-.204	-.166
	CAUSE_3	8.862E-02	.085	.116	1.047	.297	-.079	.256	.402	.099	.079
	CAUSE_5	.223	.077	.281	2.882	.005	.070	.376	.439	.265	.219
	CAUSE_7	.250	.071	.319	3.507	.001	.109	.392	.475	.317	.266
	CAUSE_9	.196	.073	.242	2.696	.008	.052	.339	.404	.249	.205
	CAUSE_12	-5.079E-02	.065	-.064	-.786	.434	-.179	.077	.167	-.075	-.060

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
8	(Constant)	1.655	.506		3.272	.001	.652	2.657			
	CAUSE_2	-.161	.075	-.212	-2.128	.036	-.310	-.011	.197	-.198	-.161
	CAUSE_3	8.794E-02	.084	.116	1.041	.300	-.079	.255	.402	.098	.079
	CAUSE_5	.216	.077	.273	2.819	.006	.064	.369	.439	.258	.214
	CAUSE_7	.240	.070	.306	3.427	.001	.101	.379	.475	.309	.260
	CAUSE_9	.185	.071	.229	2.598	.011	.044	.325	.404	.239	.197
9	(Constant)	1.642	.506		3.247	.002	.640	2.645			
	CAUSE_2	-.131	.070	-.173	-1.874	.064	-.270	.008	.197	-.174	-.142
	CAUSE_5	.238	.074	.300	3.210	.002	.091	.384	.439	.290	.243
	CAUSE_7	.261	.067	.332	3.873	.000	.127	.394	.475	.344	.294
	CAUSE_9	.201	.069	.249	2.906	.004	.064	.339	.404	.265	[illegible]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.635	12	6.470	5.092	.000[a]
	Residual	132.134	104	1.271		
	Total	209.769	116			
2	Regression	77.635	11	7.058	5.608	.000[b]
	Residual	132.134	105	1.258		
	Total	209.769	116			
3	Regression	77.635	10	7.763	6.228	.000[c]
	Residual	132.134	106	1.247		
	Total	209.769	116			
4	Regression	77.593	9	8.621	6.979	.000[d]
	Residual	132.176	107	1.235		
	Total	209.769	116			
5	Regression	77.389	8	9.674	7.892	.000[e]
	Residual	132.380	108	1.226		
	Total	209.769	116			
6	Regression	77.152	7	11.022	9.059	.000[f]
	Residual	132.617	109	1.217		
	Total	209.769	116			
7	Regression	76.786	6	12.798	10.586	.000[g]
	Residual	132.983	110	1.209		
	Total	209.769	116			
8	Regression	76.040	5	15.208	12.623	.000[h]
	Residual	133.729	111	1.205		
	Total	209.769	116			
9	Regression	74.735	4	18.684	15.497	.000[i]
	Residual	135.035	112	1.206		
	Total	209.769	116			

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_8, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5

f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_4, CAUSE_3, CAUSE_5

g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_3, CAUSE_5

h. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_3, CAUSE_5

i. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_9, CAUSE_5

j. Dependent Variable: SCP5

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
1	(Constant)	1.743	.587		2.968	.004	.578	2.908			
	CAUSE_1	4.571E-02	.091	.058	.504	.615	-.134	.225	.264	.049	.039
	CAUSE_2	-.192	.093	-.254	-2.059	.042	-.378	-.007	.197	-.198	-.160
	CAUSE_3	6.927E-02	.093	.091	.745	.458	-.115	.254	.402	.073	.058
	CAUSE_4	5.260E-02	.098	.064	.535	.594	-.142	.248	.371	.052	.042
	CAUSE_5	.201	.100	.253	1.997	.048	.001	.400	.439	.192	.155
	CAUSE_6	-1.054E-04	.092	.000	-.001	.999	-.183	.183	.400	.000	.000
	CAUSE_7	.252	.078	.321	3.219	.002	.097	.407	.475	.301	.251
	CAUSE_8	-3.527E-02	.083	-.044	-.422	.674	-.201	.130	.283	-.041	-.033
	CAUSE_9	.195	.088	.242	2.232	.028	.022	.369	.404	.214	.174
	CAUSE_10	1.143E-03	.094	.001	.012	.990	-.186	.188	.311	.001	.001
	CAUSE_11	1.575E-02	.091	.019	.174	.862	-.164	.196	.332	.017	.014
	CAUSE_12	-5.356E-02	.071	-.068	-.757	.451	-.194	.087	.167	-.074	[illegible]
2	(Constant)	1.743	.584		2.987	.004	.586	2.901			
	CAUSE_1	4.570E-02	.089	.058	.511	.610	-.132	.223	.264	.050	[illegible]
	CAUSE_2	-.192	.093	-.254	-2.071	.041	-.377	-.008	.197	-.198	[illegible]
	CAUSE_3	6.925E-02	.091	.091	.759	.450	-.112	.250	.402	.074	[illegible]
	CAUSE_4	5.261E-02	.098	.064	.538	.591	-.141	.246	.371	.052	[illegible]
	CAUSE_5	.201	.091	.253	2.208	.029	.020	.381	.439	.211	[illegible]
	CAUSE_7	.252	.076	.321	3.295	.001	.100	.403	.475	.306	[illegible]
	CAUSE_8	-3.527E-02	.083	-.044	-.425	.672	-.200	.129	.283	-.041	[illegible]
	CAUSE_9	.195	.085	.242	2.295	.024	.027	.364	.404	.219	[illegible]
	CAUSE_10	1.153E-03	.093	.001	.012	.990	-.184	.186	.311	.001	[illegible]
	CAUSE_11	1.576E-02	.090	.019	.175	.861	-.163	.194	.332	.017	.014
	CAUSE_12	-5.357E-02	.070	-.068	-.764	.446	-.193	.085	.167	-.074	-.059
3	(Constant)	1.745	.573		3.044	.003	.608	2.881			
	CAUSE_1	4.581E-02	.088	.058	.518	.606	-.130	.221	.264	.050	.040
	CAUSE_2	-.193	.091	-.254	-2.118	.037	-.373	-.012	.197	-.201	-.163
	CAUSE_3	6.929E-02	.091	.091	.763	.447	-.111	.249	.402	.074	.059
	CAUSE_4	5.284E-02	.095	.065	.553	.581	-.136	.242	.371	.054	.043
	CAUSE_5	.201	.088	.254	2.273	.025	.026	.376	.439	.216	.175
	CAUSE_7	.251	.075	.321	3.344	.001	.102	.400	.475	.309	.258
	CAUSE_8	-3.532E-02	.083	-.044	-.428	.670	-.199	.128	.283	-.042	-.033
	CAUSE_9	.196	.082	.242	2.393	.018	.034	.358	.404	.226	.185
	CAUSE_11	1.600E-02	.088	.019	.183	.855	-.157	.189	.332	.018	.014
	CAUSE_12	-5.344E-02	.069	-.068	-.775	.440	-.190	.083	.167	-.075	-.060

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
8	(Constant)		
	CAUSE_2	.580	1.724
	CAUSE_3	.466	2.145
	CAUSE_5	.612	1.635
	CAUSE_7	.720	1.389
	CAUSE_9	.742	1.347
9	(Constant)		
	CAUSE_2	.675	1.481
	CAUSE_5	.658	1.520
	CAUSE_7	.783	1.278
	CAUSE_9	.782	1.279

a. Dependent Variable: SCP5

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP5	5.380	1.7694	25
CAUSE_1	6.800	2.2913	25
CAUSE_2	6.680	2.1884	25
CAUSE_3	6.600	2.2913	25
CAUSE_4	6.820	2.3313	25
CAUSE_5	6.700	2.2638	25
CAUSE_6	6.200	2.2958	25
CAUSE_7	5.680	2.0355	25
CAUSE_8	6.400	1.8428	25
CAUSE_9	5.520	2.3826	25
CAUSE_10	6.440	2.0530	25
CAUSE_11	5.320	2.5612	25
CAUSE_12	5.600	2.3629	25

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	CAUSE_1	.465	2.152
	CAUSE_2	.399	2.507
	CAUSE_3	.406	2.466
	CAUSE_4	.421	2.378
	CAUSE_5	.376	2.657
	CAUSE_6	.444	2.250
	CAUSE_7	.610	1.639
	CAUSE_8	.564	1.774
	CAUSE_9	.516	1.938
	CAUSE_10	.538	1.859
	CAUSE_11	.502	1.991
	CAUSE_12	.754	1.326
2	(Constant)		
	CAUSE_1	.473	2.116
	CAUSE_2	.400	2.501
	CAUSE_3	.417	2.396
	CAUSE_4	.422	2.372
	CAUSE_5	.456	2.195
	CAUSE_7	.633	1.580
	CAUSE_8	.564	1.773
	CAUSE_9	.540	1.851
	CAUSE_10	.542	1.845
	CAUSE_11	.505	1.979
	CAUSE_12	.760	1.315
3	(Constant)		
	CAUSE_1	.478	2.093
	CAUSE_2	.413	2.420
	CAUSE_3	.418	2.393
	CAUSE_4	.437	2.287
	CAUSE_5	.477	2.095
	CAUSE_7	.647	1.546
	CAUSE_8	.566	1.768
	CAUSE_9	.580	1.723
	CAUSE_11	.529	1.890
	CAUSE_12	.779	1.284

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE_1	.488	2.048
	CAUSE_2	.419	2.389
	CAUSE_3	.419	2.386
	CAUSE_4	.454	2.200
	CAUSE_5	.479	2.087
	CAUSE_7	.659	1.518
	CAUSE_8	.579	1.727
	CAUSE_9	.646	1.549
	CAUSE_12	.818	1.223
5	(Constant)		
	CAUSE_1	.502	1.993
	CAUSE_2	.422	2.370
	CAUSE_3	.436	2.292
	CAUSE_4	.456	2.192
	CAUSE_5	.490	2.042
	CAUSE_7	.692	1.446
	CAUSE_9	.707	1.415
	CAUSE_12	.848	1.180
6	(Constant)		
	CAUSE_2	.551	1.813
	CAUSE_3	.436	2.291
	CAUSE_4	.459	2.177
	CAUSE_5	.517	1.933
	CAUSE_7	.692	1.445
	CAUSE_9	.714	1.401
	CAUSE_12	.854	1.170
7	(Constant)		
	CAUSE_2	.575	1.740
	CAUSE_3	.466	2.145
	CAUSE_5	.605	1.654
	CAUSE_7	.696	1.438
	CAUSE_9	.715	1.399
	CAUSE_12	.859	1.165

Model	Variables Entered	Variables Removed	Method
	CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4[a]	.	Enter
2	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).

	CAUSE_2	.474	.942	1.000	.597	.829	.621	.442	.294	.452	.385
	CAUSE_3	.193	.571	.597	1.000	.746	.442	.202	.472	.528	.498
	CAUSE_4	.356	.835	.829	.746	1.000	.747	.281	.251	.388	.389
	CAUSE_5	.050	.651	.621	.442	.747	1.000	.423	-.080	.210	.088
	CAUSE_6	.334	.440	.442	.202	.281	.423	1.000	.277	.510	.155
	CAUSE_7	.232	.316	.294	.472	.251	-.080	.277	1.000	.530	.611
	CAUSE_8	.517	.405	.452	.528	.388	.210	.510	.530	1.000	.748
	CAUSE_9	.569	.386	.385	.498	.389	.088	.155	.611	.748	1.000
	CAUSE_10	.617	.617	.624	.500	.631	.424	.414	.404	.665	.718
	CAUSE_11	.675	.452	.413	.555	.530	.165	.315	.508	.669	.736
	CAUSE_12	.536	.323	.325	.316	.221	-.090	.396	.466	.522	.401
Sig. (1-tailed)	SCP5	.	.002	.008	.177	.041	.405	.051	.132	.004	.002
	CAUSE_1	.002	.	.000	.001	.000	.000	.014	.062	.022	.028
	CAUSE_2	.008	.000	.	.001	.000	.000	.013	.077	.012	.029
	CAUSE_3	.177	.001	.001	.	.000	.014	.166	.009	.003	.006
	CAUSE_4	.041	.000	.000	.000	.	.000	.086	.113	.028	.027
	CAUSE_5	.405	.000	.000	.014	.000	.	.018	.351	.157	.338
	CAUSE_6	.051	.014	.013	.166	.086	.018	.	.090	.005	.229
	CAUSE_7	.132	.062	.077	.009	.113	.351	.090	.	.003	.001
	CAUSE_8	.004	.022	.012	.003	.028	.157	.005	.003	.	.000
	CAUSE_9	.002	.028	.029	.006	.027	.338	.229	.001	.000	.
	CAUSE_10	.001	.001	.000	.006	.000	.017	.020	.023	.000	.000
	CAUSE_11	.000	.012	.020	.002	.003	.216	.063	.005	.000	.000
	CAUSE_12	.003	.058	.057	.062	.144	.335	.025	.009	.004	.023
N	SCP5	25	25	25	25	25	25	25	25	25	25
	CAUSE_1	25	25	25	25	25	25	25	25	25	25
	CAUSE_2	25	25	25	25	25	25	25	25	25	25
	CAUSE_3	25	25	25	25	25	25	25	25	25	25
	CAUSE_4	25	25	25	25	25	25	25	25	25	25
	CAUSE_5	25	25	25	25	25	25	25	25	25	25
	CAUSE_6	25	25	25	25	25	25	25	25	25	25
	CAUSE_7	25	25	25	25	25	25	25	25	25	25
	CAUSE_8	25	25	25	25	25	25	25	25	25	25
	CAUSE_9	25	25	25	25	25	25	25	25	25	25
	CAUSE_10	25	25	25	25	25	25	25	25	25	25
	CAUSE_11	25	25	25	25	25	25	25	25	25	25
	CAUSE_12	25	25	25	25	25	25	25	25	25	25

Analysis for Ca-SCP5-CC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP5

Model Summary[i]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.919[a]	.844	.689	.9872	.844	5.425	12	12	.003
2	.919[b]	.844	.712	.9503	-.001	.046	1	14	.834
3	.918[c]	.843	.731	.9181	-.001	.068	1	15	.799
4	.916[d]	.838	.741	.9004	-.005	.425	1	16	.525
5	.914[e]	.835	.752	.8809	-.003	.315	1	17	.583
6	.908[f]	.824	.752	.8816	-.011	1.026	1	18	.326
7	.893[g]	.798	.730	.9187	-.026	2.548	1	19	.129
8	.877[h]	.769	.708	.9557	-.029	2.560	1	20	.127

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4

b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1

c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1

d. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1

e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_11, CAUSE_1

f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_11, CAUSE_1

g. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_3, CAUSE_7, CAUSE_11, CAUSE_1

h. Predictors: (Constant), CAUSE_5, CAUSE_3, CAUSE_7, CAUSE_11, CAUSE_1

i. Dependent Variable: SCP5

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP5	.617	.675	.536
	CAUSE_1	.617	.452	.323
	CAUSE_2	.624	.413	.325
	CAUSE_3	.500	.555	.316
	CAUSE_4	.631	.530	.221
	CAUSE_5	.424	.165	-.090
	CAUSE_6	.414	.315	.396
	CAUSE_7	.404	.508	.466
	CAUSE_8	.665	.669	.522
	CAUSE_9	.718	.736	.401
	CAUSE_10	1.000	.737	.394
	CAUSE_11	.737	1.000	.731
	CAUSE_12	.394	.731	1.000
Sig. (1-tailed)	SCP5	.001	.000	.003
	CAUSE_1	.001	.012	.058
	CAUSE_2	.000	.020	.057
	CAUSE_3	.006	.002	.062
	CAUSE_4	.000	.003	.144
	CAUSE_5	.017	.216	.335
	CAUSE_6	.020	.063	.025
	CAUSE_7	.023	.005	.009
	CAUSE_8	.000	.000	.004
	CAUSE_9	.000	.000	.023
	CAUSE_10	.	.000	.026
	CAUSE_11	.000	.	.000
	CAUSE_12	.026	.000	.
N	SCP5	25	25	25
	CAUSE_1	25	25	25
	CAUSE_2	25	25	25
	CAUSE_3	25	25	25
	CAUSE_4	25	25	25
	CAUSE_5	25	25	25
	CAUSE_6	25	25	25
	CAUSE_7	25	25	25
	CAUSE_8	25	25	25
	CAUSE_9	25	25	25
	CAUSE_10	25	25	25
	CAUSE_11	25	25	25
	CAUSE_12	25	25	25

Analysis for Ca-SCP5-CC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	3.617	.870		4.160	.001	1.764	5.471			
	CAUSE_1	.862	.274	1.116	3.142	.007	.277	1.447	.549	.630	.326
	CAUSE_2	-.297	.275	-.368	-1.080	.297	-.883	.289	.474	-.269	-.112
	CAUSE_3	-.183	.133	-.237	-1.376	.189	-.467	.100	.193	-.335	-.143
	CAUSE_5	-.453	.136	-.580	-3.344	.004	-.743	-.164	.050	-.654	-.347
	CAUSE_6	.144	.127	.186	1.129	.277	-.127	.415	.334	.280	.117
	CAUSE_7	-.402	.141	-.462	-2.842	.012	-.703	-.100	.232	-.592	-.295
	CAUSE_8	.114	.204	.119	.561	.583	-.320	.549	.517	.143	.058
	CAUSE_9	.222	.163	.298	1.363	.193	-.125	.568	.569	.332	.142
	CAUSE_11	.295	.123	.427	2.407	.029	.034	.556	.675	.528	.250
5	(Constant)	3.780	.802		4.715	.000	2.081	5.480			
	CAUSE_1	.826	.261	1.069	3.165	.006	.273	1.379	.549	.620	[illegible]
	CAUSE_2	-.268	.264	-.331	-1.013	.326	-.827	.292	.474	-.246	[illegible]
	CAUSE_3	-.164	.126	-.213	-1.305	.210	-.432	.103	.193	-.310	[illegible]
	CAUSE_5	-.460	.132	-.589	-3.481	.003	-.740	-.180	.050	-.656	[illegible]
	CAUSE_6	.184	.103	.238	1.788	.093	-.034	.402	.334	.408	[illegible]
	CAUSE_7	-.408	.138	-.470	-2.965	.009	-.700	-.116	.232	-.595	[illegible]
	CAUSE_9	.276	.128	.371	2.151	.047	.004	.547	.569	.474	[illegible]
	CAUSE_11	.300	.120	.435	2.511	.023	.047	.554	.675	.532	[illegible]
6	(Constant)	3.680	.796		4.622	.000	2.000	5.360			
	CAUSE_1	.594	.125	.769	4.765	.000	.331	.856	.549	.756	[illegible]
	CAUSE_3	-.205	.120	-.265	-1.711	.105	-.457	.048	.193	-.383	[illegible]
	CAUSE_5	-.440	.131	-.564	-3.366	.004	-.717	-.164	.050	-.632	[illegible]
	CAUSE_6	.160	.100	.207	1.596	.129	-.051	.371	.334	.361	.162
	CAUSE_7	-.381	.135	-.438	-2.817	.012	-.666	-.096	.232	-.564	-.236
	CAUSE_9	.251	.126	.338	1.995	.062	-.014	.517	.569	.436	.203
	CAUSE_11	.329	.116	.476	2.832	.011	.084	.574	.675	.566	.298
7	(Constant)	3.890	.818		4.753	.000	2.170	5.609			
	CAUSE_1	.614	.129	.795	4.758	.000	.343	.886	.549	.746	.504
	CAUSE_3	-.261	.119	-.339	-2.195	.042	-.512	-.011	.193	-.459	-.233
	CAUSE_5	-.360	.126	-.461	-2.861	.010	-.625	-.096	.050	-.559	-.303
	CAUSE_7	-.301	.131	-.346	-2.301	.034	-.576	-.026	.232	-.477	-.244
	CAUSE_9	.204	.128	.275	1.600	.127	-.064	.472	.569	.353	.170
	CAUSE_11	.382	.116	.553	3.297	.004	.139	.626	.675	.614	.349

ANOVA[i]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.445	12	5.287	5.425	.003[a]
	Residual	11.695	12	.975		
	Total	75.140	24			
2	Regression	63.400	11	5.764	6.382	.001[b]
	Residual	11.740	13	.903		
	Total	75.140	24			
3	Regression	63.339	10	6.334	7.514	.000[c]
	Residual	11.801	14	.843		
	Total	75.140	24			
4	Regression	62.980	9	6.998	8.632	.000[d]
	Residual	12.160	15	.811		
	Total	75.140	24			
5	Regression	62.725	8	7.841	10.105	.000[e]
	Residual	12.415	16	.776		
	Total	75.140	24			
6	Regression	61.929	7	8.847	11.384	.000[f]
	Residual	13.211	17	.777		
	Total	75.140	24			
7	Regression	59.948	6	9.991	11.839	.000[g]
	Residual	15.192	18	.844		
	Total	75.140	24			
8	Regression	57.788	5	11.558	12.655	.000[h]
	Residual	17.352	19	.913		
	Total	75.140	24			

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1
d. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_8, CAUSE_11, CAUSE_1
e. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_11, CAUSE_1
f. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_11, CAUSE_1
g. Predictors: (Constant), CAUSE_5, CAUSE_9, CAUSE_3, CAUSE_7, CAUSE_11, CAUSE_1
h. Predictors: (Constant), CAUSE_5, CAUSE_3, CAUSE_7, CAUSE_11, CAUSE_1
i. Dependent Variable: SCPS

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
8	(Constant)	3.973	.850		4.676	.000	2.195	5.752			
	CAUSE_1	.620	.134	.803	4.621	.000	.339	.901	.549	.727	.509
	CAUSE_3	-.253	.124	-.328	-2.045	.055	-.512	.006	.193	-.425	-.225
	CAUSE_5	-.363	.131	-.465	-2.773	.012	-.637	-.089	.050	-.537	-.306
	CAUSE_7	-.229	.128	-.263	-1.790	.089	-.496	.039	.232	-.380	-.197
	CAUSE_11	.487	.100	.705	4.882	.000	.278	.696	.675	.746	.538

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	3.773	1.071		3.522	.004	1.439	6.107			
	CAUSE_1	.863	.303	1.117	2.845	.015	.202	1.524	.549	.635	.324
	CAUSE_2	-.318	.352	-.394	-.904	.384	-1.085	.449	.474	-.253	-.103
	CAUSE_3	-.198	.165	-.256	-1.198	.254	-.558	.162	.193	-.327	-.136
	CAUSE_4	6.735E-02	.314	.089	.214	.834	-.617	.752	.356	.062	.024
	CAUSE_5	-.527	.200	-.674	-2.631	.022	-.963	-.091	.050	-.605	-.300
	CAUSE_6	.165	.154	.214	1.075	.304	-.170	.500	.334	.296	.122
	CAUSE_7	-.392	.158	-.452	-2.477	.029	-.738	-.047	.232	-.582	-.282
	CAUSE_8	.137	.228	.143	.602	.558	-.359	.634	.517	.171	.069
	CAUSE_9	.173	.213	.232	.811	.433	-.291	.636	.569	.228	.092
	CAUSE_10	5.230E-02	.210	.061	.249	.807	-.405	.509	.617	.072	.028
	CAUSE_11	.321	.259	.465	1.238	.239	-.244	.886	.675	.336	.141
	CAUSE_12	-7.644E-02	.187	-.102	-.408	.690	-.435	.332	.536	-.117	[illegible]
2	(Constant)	3.787	1.029		3.680	.003	1.564	6.010			
	CAUSE_1	.868	.291	1.124	2.983	.011	.239	1.497	.549	.638	[illegible]
	CAUSE_2	-.287	.309	-.355	-.931	.369	-.954	.379	.474	-.250	[illegible]
	CAUSE_3	-.184	.145	-.238	-1.264	.228	-.497	.130	.193	-.331	[illegible]
	CAUSE_5	-.503	.161	-.644	-3.127	.008	-.850	-.156	.050	-.655	[illegible]
	CAUSE_6	.153	.138	.199	1.113	.286	-.144	.451	.334	.295	[illegible]
	CAUSE_7	-.387	.151	-.446	-2.569	.023	-.713	-.062	.232	-.580	[illegible]
	CAUSE_8	.134	.219	.140	.614	.550	-.339	.608	.517	.168	[illegible]
	CAUSE_9	.159	.195	.214	.813	.431	-.263	.580	.569	.220	[illegible]
	CAUSE_10	5.262E-02	.202	.061	.261	.799	-.384	.489	.617	.072	[illegible]
	CAUSE_11	.350	.212	.507	1.650	.123	-.109	.809	.675	.416	.181
	CAUSE_12	-8.920E-02	.171	-.119	-.522	.611	-.459	.280	.536	-.143	-.057
3	(Constant)	3.857	.960		4.018	.001	1.798	5.916			
	CAUSE_1	.861	.280	1.115	3.076	.008	.261	1.461	.549	.635	.326
	CAUSE_2	-.264	.285	-.326	-.925	.371	-.875	.348	.474	-.240	-.098
	CAUSE_3	-.192	.136	-.249	-1.411	.180	-.485	.100	.193	-.353	-.149
	CAUSE_5	-.498	.154	-.638	-3.227	.006	-.829	-.167	.050	-.653	-.342
	CAUSE_6	.158	.132	.205	1.203	.249	-.124	.441	.334	.306	.127
	CAUSE_7	-.388	.146	-.446	-2.661	.019	-.700	-.075	.232	-.580	-.282
	CAUSE_8	.138	.211	.144	.655	.523	-.314	.591	.517	.173	.069
	CAUSE_9	.170	.184	.229	.928	.369	-.223	.564	.569	.241	.098
	CAUSE_11	.378	.178	.547	2.119	.052	-.005	.760	.675	.493	.224
	CAUSE_12	-.103	.157	-.137	-.652	.525	-.440	.235	.536	-.172	-.069

Model		Tolerance	VIF
8	(Constant)		
	CAUSE_1	.402	2.486
	CAUSE_3	.473	2.114
	CAUSE_5	.433	2.308
	CAUSE_7	.563	1.776
	CAUSE_11	.583	1.714

a. Dependent Variable: SCP5

Model		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.084	11.893
	CAUSE_2	.068	14.614
	CAUSE_3	.283	3.532
	CAUSE_4	.076	13.197
	CAUSE_5	.198	5.056
	CAUSE_6	.326	3.070
	CAUSE_7	.390	2.561
	CAUSE_8	.230	4.342
	CAUSE_9	.158	6.328
	CAUSE_10	.219	4.569
	CAUSE_11	.092	10.874
	CAUSE_12	.207	4.827
2	(Constant)		
	CAUSE_1	.085	11.812
	CAUSE_2	.083	12.114
	CAUSE_3	.340	2.941
	CAUSE_5	.284	3.523
	CAUSE_6	.377	2.654
	CAUSE_7	.399	2.504
	CAUSE_8	.231	4.329
	CAUSE_9	.174	5.747
	CAUSE_10	.219	4.569
	CAUSE_11	.127	7.868
	CAUSE_12	.230	4.341
3	(Constant)		
	CAUSE_1	.085	11.700
	CAUSE_2	.090	11.085
	CAUSE_3	.360	2.781
	CAUSE_5	.287	3.479
	CAUSE_6	.385	2.600
	CAUSE_7	.399	2.504
	CAUSE_8	.232	4.309
	CAUSE_9	.184	5.446
	CAUSE_11	.168	5.936
	CAUSE_12	.254	3.943

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_1	.085	11.699
	CAUSE_2	.093	10.726
	CAUSE_3	.364	2.750
	CAUSE_5	.358	2.790
	CAUSE_6	.396	2.524
	CAUSE_7	.408	2.450
	CAUSE_8	.239	4.178
	CAUSE_9	.225	4.445
	CAUSE_11	.343	2.917
5	(Constant)		
	CAUSE_1	.090	11.059
	CAUSE_2	.097	10.331
	CAUSE_3	.388	2.579
	CAUSE_5	.361	2.769
	CAUSE_6	.580	1.723
	CAUSE_7	.411	2.432
	CAUSE_9	.347	2.884
	CAUSE_11	.345	2.900
6	(Constant)		
	CAUSE_1	.398	2.516
	CAUSE_3	.431	2.322
	CAUSE_5	.369	2.710
	CAUSE_6	.613	1.632
	CAUSE_7	.428	2.335
	CAUSE_9	.359	2.782
	CAUSE_11	.366	2.735
7	(Constant)		
	CAUSE_1	.402	2.488
	CAUSE_3	.472	2.118
	CAUSE_5	.433	2.309
	CAUSE_7	.496	2.018
	CAUSE_9	.380	2.629
	CAUSE_11	.399	2.509

	CAUSE1	.307	.354	.254
	CAUSE2	.351	.397	.139
	CAUSE3	.334	.356	.189
	CAUSE4	.478	.431	.159
	CAUSE5	.432	.324	.144
	CAUSE6	.287	.288	.294
	CAUSE7	.276	.487	.261
	CAUSE8	.448	.644	.405
	CAUSE9	.412	.636	.348
	CAUSE10	1.000	.582	.393
	CAUSE11	.582	1.000	.457
	CAUSE12	.393	.457	1.000
Sig. (1-tailed)	SCP6	.001	.000	.002
	CAUSE1	.000	.000	.000
	CAUSE2	.000	.000	.025
	CAUSE3	.000	.000	.004
	CAUSE4	.000	.000	.013
	CAUSE5	.000	.000	.022
	CAUSE6	.000	.000	.000
	CAUSE7	.000	.000	.000
	CAUSE8	.000	.000	.000
	CAUSE9	.000	.000	.000
	CAUSE10	.	.000	.000
	CAUSE11	.000	.	.000
	CAUSE12	.000	.000	.
N	SCP6	197	197	197
	CAUSE1	197	197	197
	CAUSE2	197	197	197
	CAUSE3	197	197	197
	CAUSE4	197	197	197
	CAUSE5	197	197	197
	CAUSE6	197	197	197
	CAUSE7	197	197	197
	CAUSE8	197	197	197
	CAUSE9	197	197	197
	CAUSE10	197	197	197
	CAUSE11	197	197	197
	CAUSE12	197	197	197

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4[a]	.	Enter
2	.	CAUSE6	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE9	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE1	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE10	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE8	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP6-AR

	Mean	Std. Deviation	N
SCP6	5.462	1.4911	197
CAUSE1	6.127	1.9895	197
CAUSE2	5.561	1.9882	197
CAUSE3	5.660	1.9990	197
CAUSE4	5.652	2.0227	197
CAUSE5	5.510	1.9961	197
CAUSE6	5.117	1.9382	197
CAUSE7	5.272	2.0225	197
CAUSE8	6.170	1.9180	197
CAUSE9	6.297	2.1776	197
CAUSE10	5.939	1.7667	197
CAUSE11	5.338	2.0087	197
CAUSE12	5.599	1.9637	197

Analysis for Ca-SCP6-AR

Correlations

		SCP6	CAUSE1	CAUSE2	CAUSE3	CAUSE4	CAUSE5	CAUSE6	CAUSE7	CAUSE8	CAUSE9
Pearson Correlation	SCP6	1.000	.299	.299	.348	.244	.252	.266	.384	.272	.276
	CAUSE1	.299	1.000	.758	.558	.554	.537	.500	.399	.465	.414
	CAUSE2	.299	.758	1.000	.624	.693	.583	.466	.419	.439	.337
	CAUSE3	.348	.558	.624	1.000	.641	.583	.468	.469	.372	.365
	CAUSE4	.244	.554	.693	.641	1.000	.732	.453	.425	.383	.306
	CAUSE5	.252	.537	.583	.583	.732	1.000	.554	.314	.368	.225
	CAUSE6	.266	.500	.466	.468	.453	.554	1.000	.501	.442	.361
	CAUSE7	.384	.399	.419	.469	.425	.314	.501	1.000	.566	.472
	CAUSE8	.272	.465	.439	.372	.383	.368	.442	.566	1.000	.634
	CAUSE9	.276	.414	.337	.365	.306	.225	.361	.472	.634	1.000
	CAUSE10	.231	.307	.351	.334	.478	.432	.287	.276	.448	.412
	CAUSE11	.293	.354	.397	.356	.431	.324	.288	.487	.644	.636
	CAUSE12	.209	.254	.139	.189	.159	.144	.294	.261	.405	.348
Sig. (1-tailed)	SCP6	.	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE1	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE4	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE5	.000	.000	.000	.000	.000	.	.000	.000	.000	.001
	CAUSE6	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE8	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE9	.000	.000	.000	.000	.000	.001	.000	.000	.000	.
	CAUSE10	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE12	.002	.000	.025	.004	.013	.022	.000	.000	.000	.000
N	SCP6	197	197	197	197	197	197	197	197	197	197
	CAUSE1	197	197	197	197	197	197	197	197	197	197
	CAUSE2	197	197	197	197	197	197	197	197	197	197
	CAUSE3	197	197	197	197	197	197	197	197	197	197
	CAUSE4	197	197	197	197	197	197	197	197	197	197
	CAUSE5	197	197	197	197	197	197	197	197	197	197
	CAUSE6	197	197	197	197	197	197	197	197	197	197
	CAUSE7	197	197	197	197	197	197	197	197	197	197
	CAUSE8	197	197	197	197	197	197	197	197	197	197
	CAUSE9	197	197	197	197	197	197	197	197	197	197
	CAUSE10	197	197	197	197	197	197	197	197	197	197
	CAUSE11	197	197	197	197	197	197	197	197	197	197
	CAUSE12	197	197	197	197	197	197	197	197	197	197

Analysis for Ca-SCP6-AR

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	92.353	10	9.235	5.002	.000[c]
	Residual	343.429	186	1.846		
	Total	435.782	196			
4	Regression	91.694	9	10.188	5.537	.000[d]
	Residual	344.088	187	1.840		
	Total	435.782	196			
5	Regression	90.850	8	11.356	6.190	.000[e]
	Residual	344.932	188	1.835		
	Total	435.782	196			
6	Regression	90.113	7	12.873	7.039	.000[f]
	Residual	345.669	189	1.829		
	Total	435.782	196			
7	Regression	88.653	6	14.775	8.087	.000[g]
	Residual	347.129	190	1.827		
	Total	435.782	196			
8	Regression	87.062	5	17.412	9.537	.000[h]
	Residual	348.720	191	1.826		
	Total	435.782	196			
9	Regression	85.737	4	21.434	11.757	.000[i]
	Residual	350.045	192	1.823		
	Total	435.782	196			
10	Regression	84.157	3	28.052	15.397	.000[j]
	Residual	351.625	193	1.822		
	Total	435.782	196			
11	Regression	79.939	2	39.970	21.791	.000[k]
	Residual	355.843	194	1.834		
	Total	435.782	196			

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4
e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4
f. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE5, CAUSE11, CAUSE4
g. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE5, CAUSE4
h. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE4
i. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3
j. Predictors: (Constant), CAUSE12, CAUSE7, CAUSE3
k. Predictors: (Constant), CAUSE7, CAUSE3
l. Dependent Variable: SCP6

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	2.911	.448		6.501	.000	2.027	3.794			
	CAUSE1	4.187E-02	.082	.056	.510	.610	-.120	.204	.299	.038	.033
	CAUSE2	6.008E-02	.090	.080	.664	.508	-.118	.239	.299	.049	.043
	CAUSE3	.122	.072	.164	1.707	.089	-.019	.264	.348	.125	.112
	CAUSE4	-.126	.087	-.170	-1.443	.151	-.297	.046	.244	-.106	-.094
	CAUSE5	7.369E-02	.082	.099	.896	.371	-.089	.236	.252	.066	.059
	CAUSE6	-1.544E-02	.070	-.020	-.219	.827	-.154	.123	.266	-.016	-.014
	CAUSE7	.196	.067	.265	2.910	.004	.063	.328	.384	.210	.190
	CAUSE8	-6.703E-02	.080	-.086	-.841	.402	-.224	.090	.272	-.062	-.055
	CAUSE9	3.093E-02	.066	.045	.468	.640	-.099	.161	.276	.034	.031
	CAUSE10	4.994E-02	.075	.059	.668	.505	-.098	.198	.231	.049	.044
	CAUSE11	4.565E-02	.080	.061	.572	.568	-.112	.203	.293	.042	.037
	CAUSE12	5.329E-02	.060	.070	.885	.377	-.065	.172	.209	.065	.058
2	(Constant)	2.911	.447		6.520	.000	2.030	3.792			
	CAUSE1	4.039E-02	.082	.054	.495	.621	-.120	.201	.299	.036	.032
	CAUSE2	5.919E-02	.090	.079	.657	.512	-.119	.237	.299	.048	.043
	CAUSE3	.122	.072	.164	1.707	.090	-.019	.263	.348	.125	.111
	CAUSE4	-.124	.087	-.169	-1.435	.153	-.295	.047	.244	-.105	-.094
	CAUSE5	6.743E-02	.077	.090	.877	.382	-.084	.219	.252	.064	.057
	CAUSE7	.191	.064	.259	2.987	.003	.065	.317	.384	.214	.195
	CAUSE8	-6.816E-02	.079	-.088	-.859	.392	-.225	.088	.272	-.063	-.056
	CAUSE9	2.926E-02	.065	.043	.447	.655	-.100	.158	.276	.033	.029
	CAUSE10	5.026E-02	.075	.060	.674	.501	-.097	.197	.231	.049	.044
	CAUSE11	4.880E-02	.078	.066	.624	.534	-.106	.203	.293	.046	.041
	CAUSE12	5.078E-02	.059	.067	.862	.390	-.066	.167	.209	.063	.056
3	(Constant)	2.937	.442		6.645	.000	2.065	3.809			
	CAUSE1	4.764E-02	.080	.064	.597	.551	-.110	.205	.299	.044	.039
	CAUSE2	5.461E-02	.089	.073	.611	.542	-.122	.231	.299	.045	.040
	CAUSE3	.127	.071	.170	1.792	.075	-.013	.266	.348	.130	.117
	CAUSE4	-.125	.086	-.170	-1.451	.148	-.296	.045	.244	-.106	-.094
	CAUSE5	6.259E-02	.076	.084	.824	.411	-.087	.212	.252	.060	.054
	CAUSE7	.193	.064	.262	3.038	.003	.068	.319	.384	.217	.198
	CAUSE8	-5.771E-02	.076	-.074	-.763	.447	-.207	.092	.272	-.056	-.050
	CAUSE10	5.264E-02	.074	.062	.709	.479	-.094	.199	.231	.052	.046
	CAUSE11	6.027E-02	.074	.081	.817	.415	-.085	.206	.293	.060	.053
	CAUSE12	4.994E-02	.059	.066	.849	.397	-.066	.166	.209	.062	.055

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE11	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE5	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE4	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE2	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE12	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP6

Model Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	Change Statistics F Change	Change Statistics df1	Change Statistics df2	Change Statistics Sig. F Change
1	.461[a]	.213	.162	1.3653	.213	4.149	12	184	.000
2	.461[b]	.213	.166	1.3618	.000	.048	1	186	.827
3	.460[c]	.212	.170	1.3588	-.001	.200	1	187	.655
4	.459[d]	.210	.172	1.3565	-.002	.357	1	188	.551
5	.457[e]	.208	.175	1.3545	-.002	.459	1	189	.499
6	.455[f]	.207	.177	1.3524	-.002	.402	1	190	.527
7	.451[g]	.203	.178	1.3517	-.003	.798	1	191	.373
8	.447[h]	.200	.179	1.3512	-.004	.871	1	192	.352
9	.444[i]	.197	.180	1.3502	-.003	.725	1	193	.395
10	.439[j]	.193	.181	1.3498	-.004	.867	1	194	.353
11	.428[k]	.183	.175	1.3543	-.010	2.315	1	195	.130

a. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE6, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
b. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE9, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
c. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE1, CAUSE4
d. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE10, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4
e. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE5, CAUSE8, CAUSE11, CAUSE4
f. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE5, CAUSE11, CAUSE4
g. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE5, CAUSE4
h. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3, CAUSE4
i. Predictors: (Constant), CAUSE12, CAUSE2, CAUSE7, CAUSE3
j. Predictors: (Constant), CAUSE12, CAUSE7, CAUSE3
k. Predictors: (Constant), CAUSE7, CAUSE3
l. Dependent Variable: SCP6

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.813	12	7.734	4.149	.000[a]
	Residual	342.969	184	1.864		
	Total	435.782	196			
2	Regression	92.724	11	8.429	4.546	.000[b]
	Residual	343.058	185	1.854		
	Total	435.782	196			

Model		Tolerance	VIF
1	(Constant)		
	CAUSE1	.357	2.801
	CAUSE2	.294	3.403
	CAUSE3	.462	2.163
	CAUSE4	.307	3.258
	CAUSE5	.353	2.833
	CAUSE6	.511	1.958
	CAUSE7	.515	1.942
	CAUSE8	.407	2.459
	CAUSE9	.460	2.176
	CAUSE10	.545	1.836
	CAUSE11	.370	2.700
	CAUSE12	.681	1.469
2	(Constant)		
	CAUSE1	.359	2.782
	CAUSE2	.294	3.396
	CAUSE3	.463	2.162
	CAUSE4	.308	3.245
	CAUSE5	.401	2.491
	CAUSE7	.565	1.770
	CAUSE8	.408	2.449
	CAUSE9	.466	2.147
	CAUSE10	.545	1.835
	CAUSE11	.383	2.612
	CAUSE12	.706	1.416
3	(Constant)		
	CAUSE1	.374	2.672
	CAUSE2	.298	3.352
	CAUSE3	.472	2.119
	CAUSE4	.308	3.243
	CAUSE5	.410	2.442
	CAUSE7	.568	1.759
	CAUSE8	.447	2.236
	CAUSE10	.548	1.826
	CAUSE11	.429	2.332
	CAUSE12	.707	1.415

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	2.972	.437		6.797	.000	2.109	3.834			
	CAUSE2	8.462E-02	.074	.113	1.146	.253	-.061	.230	.299	.084	.074
	CAUSE3	.131	.070	.175	1.859	.065	-.008	.269	.348	.135	.121
	CAUSE4	-.128	.086	-.174	-1.490	.138	-.298	.042	.244	-.108	-.097
	CAUSE5	6.907E-02	.075	.092	.920	.359	-.079	.217	.252	.067	.060
	CAUSE7	.194	.064	.263	3.055	.003	.069	.319	.384	.218	.199
	CAUSE8	-5.099E-02	.075	-.066	-.683	.496	-.198	.096	.272	-.050	-.044
	CAUSE10	5.012E-02	.074	.059	.677	.499	-.096	.196	.231	.049	.044
	CAUSE11	5.692E-02	.073	.077	.775	.439	-.088	.202	.293	.057	.050
	CAUSE12	5.635E-02	.058	.074	.977	.330	-.057	.170	.209	.071	.063
5	(Constant)	3.062	.416		7.363	.000	2.242	3.883			
	CAUSE2	8.194E-02	.074	.109	1.113	.267	-.063	.227	.299	.081	.072
	CAUSE3	.130	.070	.174	1.850	.066	-.009	.268	.348	.134	.120
	CAUSE4	-.118	.085	-.160	-1.392	.166	-.284	.049	.244	-.101	-.090
	CAUSE5	7.612E-02	.074	.102	1.025	.307	-.070	.223	.252	.075	.067
	CAUSE7	.189	.063	.256	2.999	.003	.065	.313	.384	.214	.195
	CAUSE8	-4.714E-02	.074	-.061	-.634	.527	-.194	.100	.272	-.046	-.041
	CAUSE11	7.396E-02	.069	.100	1.073	.284	-.062	.210	.293	.078	.070
	CAUSE12	6.379E-02	.057	.084	1.128	.261	-.048	.175	.209	.082	.073
6	(Constant)	3.006	.406		7.409	.000	2.206	3.806			
	CAUSE2	7.412E-02	.072	.099	1.023	.307	-.069	.217	.299	.074	.066
	CAUSE3	.132	.070	.176	1.880	.062	-.006	.270	.348	.136	.122
	CAUSE4	-.111	.084	-.151	-1.328	.186	-.277	.054	.244	-.096	-.086
	CAUSE5	6.910E-02	.073	.093	.943	.347	-.075	.214	.252	.068	.061
	CAUSE7	.175	.059	.238	2.961	.003	.059	.292	.384	.211	.192
	CAUSE11	5.607E-02	.063	.076	.894	.373	-.068	.180	.293	.065	.058
	CAUSE12	5.783E-02	.056	.076	1.038	.300	-.052	.168	.209	.075	.067
7	(Constant)	3.026	.405		7.474	.000	2.228	3.825			
	CAUSE2	8.090E-02	.072	.108	1.124	.263	-.061	.223	.299	.081	.073
	CAUSE3	.129	.070	.173	1.848	.066	-.009	.267	.348	.133	.120
	CAUSE4	-9.959E-02	.083	-.135	-1.204	.230	-.263	.064	.244	-.087	-.078
	CAUSE5	6.836E-02	.073	.092	.933	.352	-.076	.213	.252	.068	.060
	CAUSE7	.191	.057	.259	3.380	.001	.080	.303	.384	.238	.219
	CAUSE12	7.751E-02	.051	.102	1.516	.131	-.023	.178	.209	.109	.098

Analysis for Ca-SCP6-AR

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE2	.436	2.294
	CAUSE3	.476	2.100
	CAUSE4	.309	3.232
	CAUSE5	.418	2.392
	CAUSE7	.569	1.759
	CAUSE8	.457	2.187
	CAUSE10	.549	1.820
	CAUSE11	.431	2.318
	CAUSE12	.731	1.368
5	(Constant)		
	CAUSE2	.437	2.287
	CAUSE3	.476	2.099
	CAUSE4	.320	3.125
	CAUSE5	.426	2.346
	CAUSE7	.577	1.732
	CAUSE8	.460	2.174
	CAUSE11	.489	2.046
	CAUSE12	.759	1.318
6	(Constant)		
	CAUSE2	.450	2.223
	CAUSE3	.477	2.096
	CAUSE4	.325	3.081
	CAUSE5	.436	2.294
	CAUSE7	.650	1.539
	CAUSE11	.587	1.703
	CAUSE12	.780	1.282
7	(Constant)		
	CAUSE2	.455	2.198
	CAUSE3	.478	2.092
	CAUSE4	.333	3.005
	CAUSE5	.436	2.294
	CAUSE7	.712	1.404
	CAUSE12	.925	1.081

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	3.092	.399		7.755	.000	2.305	3.878			
	CAUSE2	8.751E-02	.072	.117	1.222	.223	-.054	.229	.299	.088	.079
	CAUSE3	.141	.069	.190	2.063	.040	.006	.277	.348	.148	.134
	CAUSE4	-6.104E-02	.072	-.083	-.852	.395	-.202	.080	.244	-.062	-.055
	CAUSE7	.187	.056	.254	3.319	.001	.076	.298	.384	.234	.215
	CAUSE12	7.897E-02	.051	.104	1.546	.124	-.022	.180	.209	.111	.100
9	(Constant)	3.046	.395		7.716	.000	2.268	3.825			
	CAUSE2	5.877E-02	.063	.078	.931	.353	-.066	.183	.299	.067	.060
	CAUSE3	.122	.065	.164	1.889	.060	-.005	.250	.348	.135	.122
	CAUSE7	.182	.056	.247	3.251	.001	.072	.293	.384	.228	.210
	CAUSE12	7.806E-02	.051	.103	1.530	.128	-.023	.179	.209	.110	.099
10	(Constant)	3.144	.380		8.265	.000	2.394	3.895			
	CAUSE3	.154	.055	.207	2.817	.005	.046	.262	.348	.199	.182
	CAUSE7	.192	.055	.260	3.479	.001	.083	.300	.384	.243	.225
	CAUSE12	7.763E-02	.051	.102	1.522	.130	-.023	.178	.209	.109	.098
11	(Constant)	3.454	.322		10.714	.000	2.818	4.090			
	CAUSE3	.161	.055	.216	2.935	.004	.053	.269	.348	.206	.190
	CAUSE7	.208	.054	.282	3.846	.000	.101	.315	.384	.266	.249

Correlations

		SCP6	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP6	1.000	.282	.217	.419	.199	.319	.016	.244	.223	.180
	CAUSE_1	.282	1.000	.850	.628	.625	.540	.224	.433	.436	.416
	CAUSE_2	.217	.850	1.000	.622	.759	.595	.164	.564	.530	.543
	CAUSE_3	.419	.628	.622	1.000	.598	.633	.211	.426	.379	.350
	CAUSE_4	.199	.625	.759	.598	1.000	.785	.285	.548	.447	.549
	CAUSE_5	.319	.540	.595	.633	.785	1.000	.274	.378	.389	.396
	CAUSE_6	.016	.224	.164	.211	.285	.274	1.000	.282	.234	.159
	CAUSE_7	.244	.433	.564	.426	.548	.378	.282	1.000	.694	.552
	CAUSE_8	.223	.436	.530	.379	.447	.389	.234	.694	1.000	.784
	CAUSE_9	.180	.416	.543	.350	.549	.396	.159	.552	.784	1.000
	CAUSE_10	.207	.253	.309	.185	.359	.327	.086	.393	.664	.694
	CAUSE_11	.174	.341	.456	.217	.400	.340	.044	.524	.797	.760
	CAUSE_12	.135	.248	.108	.092	.088	.168	.099	.110	.396	.372
Sig. (1-tailed)	SCP6	.	.019	.056	.001	.072	.009	.453	.036	.051	.094
	CAUSE_1	.019	.	.000	.000	.000	.000	.050	.000	.000	.001
	CAUSE_2	.056	.000	.	.000	.000	.000	.116	.000	.000	.000
	CAUSE_3	.001	.000	.000	.	.000	.000	.061	.001	.002	.004
	CAUSE_4	.072	.000	.000	.000	.	.000	.017	.000	.000	.000
	CAUSE_5	.009	.000	.000	.000	.000	.	.022	.002	.002	.001
	CAUSE_6	.453	.050	.116	.061	.017	.022	.	.019	.043	.123
	CAUSE_7	.036	.000	.000	.001	.000	.002	.019	.	.000	.000
	CAUSE_8	.051	.000	.000	.002	.000	.002	.043	.000	.	.000
	CAUSE_9	.094	.001	.000	.004	.000	.001	.123	.000	.000	.
	CAUSE_10	.065	.031	.011	.088	.004	.007	.267	.001	.000	.000
	CAUSE_11	.102	.005	.000	.056	.001	.006	.375	.000	.000	.000
	CAUSE_12	.162	.034	.217	.251	.263	.110	.236	.212	.001	.003
N	SCP6	55	55	55	55	55	55	55	55	55	55
	CAUSE_1	55	55	55	55	55	55	55	55	55	55
	CAUSE_2	55	55	55	55	55	55	55	55	55	55
	CAUSE_3	55	55	55	55	55	55	55	55	55	55
	CAUSE_4	55	55	55	55	55	55	55	55	55	55
	CAUSE_5	55	55	55	55	55	55	55	55	55	55
	CAUSE_6	55	55	55	55	55	55	55	55	55	55
	CAUSE_7	55	55	55	55	55	55	55	55	55	55
	CAUSE_8	55	55	55	55	55	55	55	55	55	55
	CAUSE_9	55	55	55	55	55	55	55	55	55	55
	CAUSE_10	55	55	55	55	55	55	55	55	55	55
	CAUSE_11	55	55	55	55	55	55	55	55	55	55
	CAUSE_12	55	55	55	55	55	55	55	55	55	55

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP6	.207	.174	.135
	CAUSE_1	.253	.341	.248
	CAUSE_2	.309	.456	.108
	CAUSE_3	.185	.217	.092
	CAUSE_4	.359	.400	.088
	CAUSE_5	.327	.340	.168
	CAUSE_6	.086	.044	.099
	CAUSE_7	.393	.524	.110
	CAUSE_8	.664	.797	.396
	CAUSE_9	.694	.760	.372
	CAUSE_10	1.000	.724	.544
	CAUSE_11	.724	1.000	.370
	CAUSE_12	.544	.370	1.000
Sig. (1-tailed)	SCP6	.065	.102	.162
	CAUSE_1	.031	.005	.034
	CAUSE_2	.011	.000	.217
	CAUSE_3	.088	.056	.251
	CAUSE_4	.004	.001	.263
	CAUSE_5	.007	.006	.110
	CAUSE_6	.267	.375	.236
	CAUSE_7	.001	.000	.212
	CAUSE_8	.000	.000	.001
	CAUSE_9	.000	.000	.003
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.003
	CAUSE_12	.000	.003	.
N	SCP6	55	55	55
	CAUSE_1	55	55	55
	CAUSE_2	55	55	55
	CAUSE_3	55	55	55
	CAUSE_4	55	55	55
	CAUSE_5	55	55	55
	CAUSE_6	55	55	55
	CAUSE_7	55	55	55
	CAUSE_8	55	55	55
	CAUSE_9	55	55	55

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE2	.459	2.177
	CAUSE3	.496	2.017
	CAUSE4	.443	2.256
	CAUSE7	.717	1.395
	CAUSE12	.926	1.080
9	(Constant)		
	CAUSE2	.590	1.694
	CAUSE3	.556	1.799
	CAUSE7	.724	1.380
	CAUSE12	.926	1.080
10	(Constant)		
	CAUSE3	.775	1.290
	CAUSE7	.749	1.335
	CAUSE12	.926	1.080
11	(Constant)		
	CAUSE3	.780	1.282
	CAUSE7	.780	1.282

a. Dependent Variable: SCP6

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP6	5.247	1.6403	55
CAUSE_1	5.391	2.2396	55
CAUSE_2	5.464	2.1897	55
CAUSE_3	5.400	2.2307	55
CAUSE_4	5.764	2.4092	55
CAUSE_5	5.500	2.2812	55
CAUSE_6	5.655	9.0615	55
CAUSE_7	4.600	2.4578	55
CAUSE_8	5.482	2.2770	55
CAUSE_9	4.809	2.1398	55
CAUSE_10	6.400	1.9940	55
CAUSE_11	4.891	2.3935	55
CAUSE_12	5.245	2.2564	55

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.509[a]	.259	.047	1.6011	.259	1.223	12	42	.300
2	.509[b]	.259	.069	1.5824	.000	.000	1	44	.998
3	.509[c]	.259	.091	1.5643	.000	.002	1	45	.964
4	.509[d]	.259	.110	1.5472	.000	.017	1	46	.897
5	.507[e]	.257	.127	1.5324	-.002	.125	1	47	.725
6	.496[f]	.246	.134	1.5266	-.010	.648	1	48	.425
7	.482[g]	.232	.136	1.5248	-.014	.882	1	49	.352
8	.467[h]	.218	.138	1.5228	-.014	.874	1	50	.355
9	.451[i]	.204	.140	1.5211	-.014	.887	1	51	.351
10	.436[j]	.190	.143	1.5189	-.014	.855	1	52	.359
11	.425[k]	.181	.149	1.5128	-.009	.582	1	53	.449
12	.419[l]	.176	.160	1.5033	-.005	.337	1	54	.564

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2

d. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2

e. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_2

f. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_2

g. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_2

h. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_2

i. Predictors: (Constant), CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_2

j. Predictors: (Constant), CAUSE_3, CAUSE_7, CAUSE_2

k. Predictors: (Constant), CAUSE_3, CAUSE_7

l. Predictors: (Constant), CAUSE_3

m. Dependent Variable: SCP6

ANOVA[m]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.627	12	3.136	1.223	.300[a]
	Residual	107.670	42	2.564		
	Total	145.297	54			

ANOVA[m]

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	37.627	11	3.421	1.366	.224[b]
	Residual	107.670	43	2.504		
	Total	145.297	54			
3	Regression	37.622	10	3.762	1.537	.159[c]
	Residual	107.675	44	2.447		
	Total	145.297	54			
4	Regression	37.581	9	4.176	1.744	.107[d]
	Residual	107.716	45	2.394		
	Total	145.297	54			
5	Regression	37.281	8	4.660	1.985	.070[e]
	Residual	108.016	46	2.348		
	Total	145.297	54			
6	Regression	35.759	7	5.108	2.192	.052[f]
	Residual	109.538	47	2.331		
	Total	145.297	54			
7	Regression	33.703	6	5.617	2.416	.040[g]
	Residual	111.594	48	2.325		
	Total	145.297	54			
8	Regression	31.671	5	6.334	2.732	.030[h]
	Residual	113.626	49	2.319		
	Total	145.297	54			
9	Regression	29.614	4	7.403	3.200	.020[i]
	Residual	115.684	50	2.314		
	Total	145.297	54			
10	Regression	27.634	3	9.211	3.993	.012[j]
	Residual	117.663	51	2.307		
	Total	145.297	54			
11	Regression	26.291	2	13.146	5.744	.006[k]
	Residual	119.006	52	2.289		
	Total	145.297	54			
12	Regression	25.521	1	25.521	11.293	.001[l]
	Residual	119.776	53	2.260		
	Total	145.297	54			

a. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

b. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2

c. Predictors: (Constant), CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2

d. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_8, CAUSE_2

e. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_2

f. Predictors: (Constant), CAUSE_4, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_2

g. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_5, CAUSE_2

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_4, CAUSE_6, CAUSE_11, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_10, CAUSE_5, CAUSE_9, CAUSE_8, CAUSE_2[a]	.	Enter
2	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
12	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP6

Analysis for Ca-SCP6-MC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	2.948	.829		3.555	.001	1.278	4.618			
	CAUSE_1	.175	.190	.239	.920	.362	-.208	.559	.282	.136	.118
	CAUSE_2	-.204	.239	-.272	-.851	.399	-.685	.278	.217	-.126	-.109
	CAUSE_3	.272	.139	.370	1.959	.056	-.008	.552	.419	.280	.251
	CAUSE_4	-.191	.187	-.281	-1.023	.312	-.568	.186	.199	-.151	-.131
	CAUSE_5	.194	.164	.270	1.185	.242	-.136	.524	.319	.174	.152
	CAUSE_6	-2.175E-02	.026	-.120	-.848	.401	-.073	.030	.016	-.125	-.109
	CAUSE_7	.146	.134	.219	1.087	.283	-.125	.417	.244	.160	.140
	CAUSE_8	-5.947E-02	.168	-.083	-.354	.725	-.398	.279	.223	-.053	-.045
	CAUSE_10	.127	.149	.154	.850	.400	-.173	.427	.207	.126	.109
5	(Constant)	2.982	.816		3.654	.001	1.339	4.624			
	CAUSE_1	.177	.189	.242	.939	.353	-.203	.557	.282	.137	.11[illegible]
	CAUSE_2	-.220	.232	-.294	-.950	.347	-.687	.247	.217	-.139	-.12[illegible]
	CAUSE_3	.270	.137	.367	1.962	.056	-.007	.546	.419	.278	.24[illegible]
	CAUSE_4	-.177	.181	-.259	-.977	.333	-.540	.187	.199	-.143	-.12[illegible]
	CAUSE_5	.189	.162	.263	1.171	.248	-.136	.514	.319	.170	.14[illegible]
	CAUSE_6	-2.287E-02	.025	-.126	-.907	.369	-.074	.028	.016	-.133	-.11[illegible]
	CAUSE_7	.122	.114	.182	1.065	.293	-.108	.352	.244	.155	.135
	CAUSE_10	9.488E-02	.118	.115	.805	.425	-.142	.332	.207	.118	.10[illegible]
6	(Constant)	3.390	.636		5.327	.000	2.110	4.671			
	CAUSE_1	.184	.188	.251	.980	.332	-.194	.562	.282	.142	.12[illegible]
	CAUSE_2	-.224	.231	-.299	-.971	.337	-.689	.240	.217	-.140	-.12[illegible]
	CAUSE_3	.255	.136	.347	1.879	.066	-.018	.528	.419	.264	.238
	CAUSE_4	-.169	.180	-.248	-.939	.352	-.530	.193	.199	-.136	-.119
	CAUSE_5	.209	.159	.290	1.311	.196	-.112	.529	.319	.188	.166
	CAUSE_6	-2.445E-02	.025	-.135	-.976	.334	-.075	.026	.016	-.141	-.124
	CAUSE_7	.148	.109	.221	1.349	.184	-.073	.368	.244	.193	.171
7	(Constant)	3.385	.636		5.325	.000	2.107	4.663			
	CAUSE_1	.207	.186	.283	1.116	.270	-.166	.581	.282	.159	.141
	CAUSE_2	-.317	.208	-.424	-1.522	.135	-.737	.102	.217	-.215	-.193
	CAUSE_3	.258	.135	.351	1.905	.063	-.014	.530	.419	.265	.241
	CAUSE_5	.119	.127	.165	.935	.355	-.137	.374	.319	.134	.118
	CAUSE_6	-2.732E-02	.025	-.151	-1.100	.277	-.077	.023	.016	-.157	-.139
	CAUSE_7	.128	.107	.191	1.191	.239	-.085	.343	.244	.169	.151

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	3.538	.613		5.769	.000	2.306	4.771			
	CAUSE_1	.198	.185	.271	1.070	.290	-.174	.571	.282	.151	.135
	CAUSE_2	-.269	.202	-.359	-1.334	.188	-.674	.136	.217	-.187	-.168
	CAUSE_3	.309	.124	.420	2.492	.016	.060	.558	.419	.335	.315
	CAUSE_6	-2.294E-02	.024	-.127	-.942	.351	-.072	.026	.016	-.133	-.119
	CAUSE_7	.124	.107	.186	1.163	.250	-.091	.339	.244	.164	.147
9	(Constant)	3.557	.612		5.809	.000	2.327	4.787			
	CAUSE_1	.169	.182	.230	.925	.359	-.198	.535	.282	.130	.117
	CAUSE_2	-.238	.199	-.318	-1.197	.237	-.637	.161	.217	-.167	-.151
	CAUSE_3	.300	.123	.408	2.432	.019	.052	.548	.419	.325	.307
	CAUSE_7	.100	.104	.150	.965	.339	-.108	.308	.244	.135	.12[illegible]
10	(Constant)	3.624	.607		5.968	.000	2.405	4.843			
	CAUSE_2	-.101	.133	-.135	-.763	.449	-.368	.166	.217	-.106	-.09[illegible]
	CAUSE_3	.329	.119	.448	2.765	.008	.090	.569	.419	.361	.34[illegible]
	CAUSE_7	8.676E-02	.103	.130	.846	.401	-.119	.293	.244	.118	.10[illegible]
11	(Constant)	3.472	.571		6.076	.000	2.325	4.619			
	CAUSE_3	.283	.102	.385	2.775	.008	.078	.488	.419	.359	.34[illegible]
	CAUSE_7	5.371E-02	.093	.080	.580	.564	-.132	.239	.244	.090	.07[illegible]
12	(Constant)	3.583	.535		6.696	.000	2.510	4.656			
	CAUSE_3	.308	.092	.419	3.360	.001	.124	.492	.419	.419	.41[illegible]

ANOVA[m]

h. Predictors: (Constant), CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_2
i. Predictors: (Constant), CAUSE_3, CAUSE_7, CAUSE_1, CAUSE_2
j. Predictors: (Constant), CAUSE_3, CAUSE_7, CAUSE_2
k. Predictors: (Constant), CAUSE_3, CAUSE_7
l. Predictors: (Constant), CAUSE_3
m. Dependent Variable: SCP6

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	2.975	.895		3.325	.002	1.170	4.780			
	CAUSE_1	.185	.211	.253	.879	.384	-.240	.610	.282	.134	.117
	CAUSE_2	-.212	.257	-.284	-.827	.413	-.731	.306	.217	-.127	-.110
	CAUSE_3	.271	.147	.368	1.839	.073	-.026	.568	.419	.273	.244
	CAUSE_4	-.197	.205	-.289	-.961	.342	-.610	.217	.199	-.147	-.128
	CAUSE_5	.197	.175	.274	1.130	.265	-.155	.550	.319	.172	.150
	CAUSE_6	-2.161E-02	.027	-.119	-.795	.431	-.076	.033	.016	-.122	-.106
	CAUSE_7	.145	.141	.217	1.023	.312	-.141	.430	.244	.156	.136
	CAUSE_8	-5.993E-02	.221	-.083	-.271	.788	-.507	.387	.223	-.042	-.036
	CAUSE_9	8.838E-03	.201	.012	.044	.965	-.397	.414	.180	.007	.006
	CAUSE_10	.133	.188	.162	.708	.483	-.247	.513	.207	.109	.09[illegible]
	CAUSE_11	-4.658E-04	.182	-.001	-.003	.998	-.368	.367	.174	.000	.00[illegible]
	CAUSE_12	-1.655E-02	.128	-.023	-.129	.898	-.275	.242	.135	-.020	-.01[illegible]
2	(Constant)	2.975	.876		3.398	.001	1.209	4.741			
	CAUSE_1	.185	.208	.253	.890	.378	-.235	.605	.282	.134	.11[illegible]
	CAUSE_2	-.212	.253	-.284	-.839	.406	-.723	.298	.217	-.127	-.11[illegible]
	CAUSE_3	.271	.142	.368	1.904	.064	-.016	.558	.419	.279	.25[illegible]
	CAUSE_4	-.197	.202	-.289	-.974	.336	-.604	.211	.199	-.147	-.12[illegible]
	CAUSE_5	.197	.171	.274	1.151	.256	-.148	.543	.319	.173	.15[illegible]
	CAUSE_6	-2.160E-02	.026	-.119	-.822	.416	-.075	.031	.016	-.124	-.10[illegible]
	CAUSE_7	.145	.140	.217	1.035	.307	-.137	.426	.244	.156	.13[illegible]
	CAUSE_8	-6.016E-02	.200	-.084	-.301	.764	-.463	.342	.223	-.046	-.04[illegible]
	CAUSE_9	8.722E-03	.193	.011	.045	.964	-.381	.399	.180	.007	.006
	CAUSE_10	.133	.176	.162	.754	.455	-.222	.488	.207	.114	.099
	CAUSE_12	-1.653E-02	.126	-.023	-.131	.896	-.271	.238	.135	-.020	-.017
3	(Constant)	2.969	.853		3.479	.001	1.249	4.688			
	CAUSE_1	.184	.205	.252	.900	.373	-.228	.597	.282	.134	.117
	CAUSE_2	-.211	.249	-.282	-.849	.400	-.712	.290	.217	-.127	-.110
	CAUSE_3	.271	.141	.369	1.927	.060	-.012	.554	.419	.279	.250
	CAUSE_4	-.194	.190	-.285	-1.019	.314	-.577	.189	.199	-.152	-.132
	CAUSE_5	.196	.166	.272	1.179	.245	-.139	.530	.319	.175	.153
	CAUSE_6	-2.164E-02	.026	-.120	-.834	.409	-.074	.031	.016	-.125	-.108
	CAUSE_7	.144	.137	.215	1.048	.300	-.133	.420	.244	.156	.136
	CAUSE_8	-5.578E-02	.172	-.077	-.324	.748	-.403	.291	.223	-.049	-.042
	CAUSE_10	.135	.165	.165	.819	.417	-.198	.469	.207	.123	.106
	CAUSE_12	-1.622E-02	.125	-.022	-.130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Model		Collinearity Statistics Tolerance	VIF
8	(Constant)		
	CAUSE_1	.249	4.010
	CAUSE_2	.220	4.543
	CAUSE_3	.562	1.779
	CAUSE_6	.882	1.134
	CAUSE_7	.621	1.610
9	(Constant)		
	CAUSE_1	.257	3.894
	CAUSE_2	.226	4.422
	CAUSE_3	.565	1.769
	CAUSE_7	.660	1.516
10	(Constant)		
	CAUSE_2	.504	1.985
	CAUSE_3	.605	1.653
	CAUSE_7	.673	1.487
11	(Constant)		
	CAUSE_3	.819	1.221
	CAUSE_7	.819	1.221
12	(Constant)		
	CAUSE_3	1.000	1.000

a. Dependent Variable: SCP6

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SCP6	5.551	1.3778	117
CAUSE_1	6.329	1.6945	117
CAUSE_2	5.368	1.7731	117
CAUSE_3	5.581	1.7665	117
CAUSE_4	5.350	1.6417	117
CAUSE_5	5.261	1.6976	117
CAUSE_6	5.171	1.7034	117
CAUSE_7	5.500	1.7145	117
CAUSE_8	6.444	1.6697	117
CAUSE_9	7.162	1.6646	117
CAUSE_10	5.615	1.5134	117
CAUSE_11	5.551	1.6287	117
CAUSE_12	5.765	1.2039	117

Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.150	6.668
	CAUSE_3	.440	2.272
	CAUSE_4	.195	5.125
	CAUSE_5	.299	3.343
	CAUSE_6	.783	1.277
	CAUSE_7	.394	2.541
	CAUSE_8	.187	5.351
	CAUSE_9	.257	3.897
	CAUSE_10	.337	2.964
	CAUSE_11	.250	3.995
	CAUSE_12	.568	1.761
2	(Constant)		
	CAUSE_1	.213	4.690
	CAUSE_2	.151	6.629
	CAUSE_3	.460	2.173
	CAUSE_4	.196	5.106
	CAUSE_5	.303	3.299
	CAUSE_6	.818	1.223
	CAUSE_7	.394	2.541
	CAUSE_8	.225	4.453
	CAUSE_9	.271	3.695
	CAUSE_10	.375	2.664
	CAUSE_12	.571	1.751
3	(Constant)		
	CAUSE_1	.215	4.641
	CAUSE_2	.153	6.541
	CAUSE_3	.461	2.171
	CAUSE_4	.216	4.630
	CAUSE_5	.316	3.165
	CAUSE_6	.819	1.221
	CAUSE_7	.399	2.509
	CAUSE_8	.295	3.394
	CAUSE_10	.417	2.400
	CAUSE_12	.573	1.745

Coefficients[a]

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE_1	.244	4.104
	CAUSE_2	.162	6.180
	CAUSE_3	.462	2.165
	CAUSE_4	.218	4.586
	CAUSE_5	.318	3.145
	CAUSE_6	.820	1.220
	CAUSE_7	.406	2.465
	CAUSE_8	.303	3.302
	CAUSE_10	.503	1.989
5	(Constant)		
	CAUSE_1	.244	4.101
	CAUSE_2	.169	5.933
	CAUSE_3	.463	2.159
	CAUSE_4	.230	4.355
	CAUSE_5	.320	3.122
	CAUSE_6	.833	1.201
	CAUSE_7	.550	1.817
	CAUSE_10	.788	1.270
6	(Constant)		
	CAUSE_1	.244	4.093
	CAUSE_2	.169	5.931
	CAUSE_3	.471	2.121
	CAUSE_4	.230	4.343
	CAUSE_5	.328	3.052
	CAUSE_6	.838	1.194
	CAUSE_7	.597	1.675
7	(Constant)		
	CAUSE_1	.249	4.021
	CAUSE_2	.207	4.841
	CAUSE_3	.472	2.120
	CAUSE_5	.514	1.947
	CAUSE_6	.850	1.176
	CAUSE_7	.620	1.612

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5	.	Enter
2	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_12	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_6	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: SCP6

Correlations

		SCP6	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP6	1.000	.238	.320	.304	.281	.264	.241	.487	.212	.306
	CAUSE_1	.238	1.000	.662	.486	.432	.520	.496	.329	.453	.384
	CAUSE_2	.320	.662	1.000	.607	.561	.516	.445	.355	.402	.390
	CAUSE_3	.304	.486	.607	1.000	.624	.565	.566	.500	.319	.473
	CAUSE_4	.281	.432	.561	.624	1.000	.644	.472	.420	.395	.386
	CAUSE_5	.264	.520	.516	.565	.644	1.000	.654	.405	.446	.376
	CAUSE_6	.241	.496	.445	.566	.472	.654	1.000	.481	.417	.464
	CAUSE_7	.487	.329	.355	.500	.420	.405	.481	1.000	.416	.331
	CAUSE_8	.212	.453	.402	.319	.395	.446	.417	.416	1.000	.478
	CAUSE_9	.306	.384	.390	.473	.386	.376	.464	.331	.478	1.000
	CAUSE_10	.223	.331	.265	.394	.487	.492	.348	.229	.339	.502
	CAUSE_11	.280	.288	.386	.406	.495	.429	.356	.418	.483	.537
	CAUSE_12	.099	.199	.112	.218	.237	.238	.278	.292	.350	.289
Sig. (1-tailed)	SCP6	.	.005	.000	.000	.001	.002	.004	.000	.011	.000
	CAUSE_1	.005	.	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_2	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	CAUSE_3	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	CAUSE_4	.001	.000	.000	.000	.	.000	.000	.000	.000	.000
	CAUSE_5	.002	.000	.000	.000	.000	.	.000	.000	.000	.000
	CAUSE_6	.004	.000	.000	.000	.000	.000	.	.000	.000	.000
	CAUSE_7	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
	CAUSE_8	.011	.000	.000	.000	.000	.000	.000	.000	.	.000
	CAUSE_9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.
	CAUSE_10	.008	.000	.002	.000	.000	.000	.000	.006	.000	.000
	CAUSE_11	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000
	CAUSE_12	.145	.016	.114	.009	.005	.005	.001	.001	.000	.001
N	SCP6	117	117	117	117	117	117	117	117	117	117
	CAUSE_1	117	117	117	117	117	117	117	117	117	117
	CAUSE_2	117	117	117	117	117	117	117	117	117	117
	CAUSE_3	117	117	117	117	117	117	117	117	117	117
	CAUSE_4	117	117	117	117	117	117	117	117	117	117
	CAUSE_5	117	117	117	117	117	117	117	117	117	117
	CAUSE_6	117	117	117	117	117	117	117	117	117	117
	CAUSE_7	117	117	117	117	117	117	117	117	117	117
	CAUSE_8	117	117	117	117	117	117	117	117	117	117
	CAUSE_9	117	117	117	117	117	117	117	117	117	117
	CAUSE_10	117	117	117	117	117	117	117	117	117	117
	CAUSE_11	117	117	117	117	117	117	117	117	117	117
	CAUSE_12	117	117	117	117	117	117	117	117	117	117

Correlations

		CAUSE_10	CAUSE_11	CAUSE_12
Pearson Correlation	SCP6	.223	.280	.099
	CAUSE_1	.331	.288	.199
	CAUSE_2	.265	.386	.112
	CAUSE_3	.394	.406	.218
	CAUSE_4	.487	.495	.237
	CAUSE_5	.492	.429	.238
	CAUSE_6	.348	.356	.278
	CAUSE_7	.229	.418	.292
	CAUSE_8	.339	.483	.350
	CAUSE_9	.502	.537	.289
	CAUSE_10	1.000	.506	.349
	CAUSE_11	.506	1.000	.392
	CAUSE_12	.349	.392	1.000
Sig. (1-tailed)	SCP6	.008	.001	.145
	CAUSE_1	.000	.001	.016
	CAUSE_2	.002	.000	.114
	CAUSE_3	.000	.000	.009
	CAUSE_4	.000	.000	.005
	CAUSE_5	.000	.000	.005
	CAUSE_6	.000	.000	.001
	CAUSE_7	.006	.000	.001
	CAUSE_8	.000	.000	.000
	CAUSE_9	.000	.000	.001
	CAUSE_10	.	.000	.000
	CAUSE_11	.000	.	.000
	CAUSE_12	.000	.000	.
N	SCP6	117	117	117
	CAUSE_1	117	117	117
	CAUSE_2	117	117	117
	CAUSE_3	117	117	117
	CAUSE_4	117	117	117
	CAUSE_5	117	117	117
	CAUSE_6	117	117	117
	CAUSE_7	117	117	117
	CAUSE_8	117	117	117
	CAUSE_9	117	117	117
	CAUSE_10	117	117	117
	CAUSE_11	[illegible]	[illegible]	[illegible]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	2.693	.636		4.236	.000	1.432	3.954			
	CAUSE_1	-1.182E-02	.098	-.015	-.121	.904	-.206	.183	.238	-.012	-.010
	CAUSE_2	.144	.101	.186	1.427	.157	-.056	.345	.320	.139	.117
	CAUSE_3	-5.938E-02	.101	-.076	-.590	.557	-.259	.140	.304	-.058	-.048
	CAUSE_4	-7.748E-03	.106	-.009	-.073	.942	-.219	.203	.281	-.007	-.006
	CAUSE_5	3.859E-02	.109	.048	.355	.723	-.177	.254	.264	.035	.029
	CAUSE_6	-7.976E-02	.100	-.099	-.800	.426	-.278	.118	.241	-.078	-.066
	CAUSE_7	.385	.085	.480	4.557	.000	.218	.553	.487	.408	.375
	CAUSE_8	-7.719E-02	.090	-.094	-.854	.395	-.256	.102	.212	-.083	-.070
	CAUSE_9	.141	.095	.170	1.490	.139	-.047	.329	.306	.145	.122
	CAUSE_10	7.740E-02	.102	.085	.759	.450	-.125	.280	.223	.074	.062
	CAUSE_11	6.127E-04	.098	.001	.006	.995	-.194	.195	.280	.001	.001
	CAUSE_12	-5.733E-02	.077	-.071	-.749	.455	-.209	.094	.099	-.073	[illegible]
2	(Constant)	2.693	.632		4.259	.000	1.439	3.947			
	CAUSE_1	-1.191E-02	.096	-.015	-.123	.902	-.203	.179	.238	-.012	[illegible]
	CAUSE_2	.144	.100	.186	1.450	.150	-.053	.342	.320	.140	[illegible]
	CAUSE_3	-5.941E-02	.100	-.076	-.593	.554	-.258	.139	.304	-.058	[illegible]
	CAUSE_4	-7.654E-03	.105	-.009	-.073	.942	-.215	.200	.281	-.007	[illegible]
	CAUSE_5	3.963E-02	.108	.048	.357	.722	-.176	.253	.264	.035	[illegible]
	CAUSE_6	-7.980E-02	.099	-.099	-.806	.422	-.276	.116	.241	-.078	-.066
	CAUSE_7	.386	.083	.480	4.649	.000	.221	.550	.487	.413	[illegible]
	CAUSE_8	-7.710E-02	.089	-.093	-.869	.387	-.253	.099	.212	-.084	[illegible]
	CAUSE_9	.141	.091	.171	1.549	.124	-.040	.322	.306	.149	[illegible]
	CAUSE_10	7.753E-02	.099	.085	.780	.437	-.120	.275	.223	.076	.064
	CAUSE_12	-5.724E-02	.075	-.071	-.765	.446	-.206	.091	.099	-.074	-.063
3	(Constant)	2.691	.628		4.282	.000	1.445	3.936			
	CAUSE_1	-1.124E-02	.096	-.014	-.118	.907	-.201	.178	.238	-.011	-.010
	CAUSE_2	.143	.096	.184	1.480	.142	-.049	.334	.320	.142	.120
	CAUSE_3	-6.126E-02	.096	-.079	-.636	.526	-.252	.130	.304	-.062	-.052
	CAUSE_5	3.625E-02	.103	.045	.353	.725	-.167	.240	.264	.034	.029
	CAUSE_6	-7.938E-02	.098	-.098	-.807	.421	-.274	.116	.241	-.078	-.066
	CAUSE_7	.385	.082	.479	4.684	.000	.222	.548	.487	.414	.381
	CAUSE_8	-7.752E-02	.088	-.094	-.880	.381	-.252	.097	.212	-.085	-.072
	CAUSE_9	.142	.091	.171	1.561	.121	-.038	.321	.306	.150	.127
	CAUSE_10	7.593E-02	.096	.083	.787	.433	-.115	.267	.223	.076	.064
	CAUSE_12	-5.735E-02	.075	-.071	-.770	.443	-.205	.090	.099	-.075	-.063

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
4	(Constant)	2.675	.612		4.372	.000	1.462	3.889			
	CAUSE_2	.138	.085	.177	1.615	.109	-.031	.306	.320	.154	.131
	CAUSE_3	-6.124E-02	.096	-.079	-.638	.525	-.251	.129	.304	-.062	-.052
	CAUSE_5	3.533E-02	.102	.044	.347	.729	-.167	.237	.264	.034	.028
	CAUSE_6	-8.111E-02	.097	-.100	-.838	.404	-.273	.111	.241	-.081	-.068
	CAUSE_7	.385	.082	.479	4.713	.000	.223	.547	.487	.415	.382
	CAUSE_8	-7.915E-02	.087	-.096	-.913	.363	-.251	.093	.212	-.088	-.074
	CAUSE_9	.142	.090	.171	1.569	.120	-.037	.320	.306	.150	.127
	CAUSE_10	7.515E-02	.096	.083	.784	.435	-.115	.265	.223	.076	.064
	CAUSE_12	-5.757E-02	.074	-.071	-.777	.439	-.205	.089	.099	-.075	-.063
5	(Constant)	2.676	.609		4.390	.000	1.468	3.884			
	CAUSE_2	.143	.083	.184	1.723	.088	-.022	.308	.320	.164	.139
	CAUSE_3	-5.632E-02	.094	-.072	-.596	.552	-.244	.131	.304	-.057	[illegible]
	CAUSE_6	-6.650E-02	.087	-.082	-.766	.445	-.239	.106	.241	-.074	[illegible]
	CAUSE_7	.386	.081	.480	4.736	.000	.224	.547	.487	.415	[illegible]
	CAUSE_8	-7.393E-02	.085	-.090	-.870	.386	-.242	.095	.212	-.083	[illegible]
	CAUSE_9	.136	.088	.164	1.538	.127	-.039	.311	.306	.146	[illegible]
	CAUSE_10	8.646E-02	.090	.095	.964	.337	-.091	.264	.223	.092	[illegible]
	CAUSE_12	-5.882E-02	.074	-.073	-.798	.427	-.205	.087	.099	-.077	[illegible]
6	(Constant)	2.678	.608		4.407	.000	1.474	3.882			
	CAUSE_2	.121	.074	.156	1.632	.106	-.026	.269	.320	.154	[illegible]
	CAUSE_6	-7.981E-02	.084	-.099	-.955	.342	-.246	.086	.241	-.091	[illegible]
	CAUSE_7	.372	.078	.463	4.773	.000	.218	.527	.487	.416	[illegible]
	CAUSE_8	-6.545E-02	.084	-.079	-.783	.435	-.231	.100	.212	-.075	-.065
	CAUSE_9	.128	.087	.154	1.468	.145	-.045	.300	.306	.139	.118
	CAUSE_10	7.753E-02	.088	.085	.879	.381	-.097	.252	.223	.084	.071
	CAUSE_12	-5.914E-02	.074	-.073	-.804	.423	-.205	.087	.099	-.077	-.065
7	(Constant)	2.598	.598		4.345	.000	1.413	3.783			
	CAUSE_2	.110	.073	.142	1.513	.133	-.034	.255	.320	.143	.122
	CAUSE_6	-8.482E-02	.083	-.105	-1.019	.310	-.250	.080	.241	-.097	-.082
	CAUSE_7	.361	.077	.449	4.717	.000	.209	.513	.487	.410	.379
	CAUSE_9	.112	.085	.135	1.324	.188	-.056	.279	.306	.125	.106
	CAUSE_10	7.452E-02	.088	.082	.847	.399	-.100	.249	.223	.081	.068
	CAUSE_12	-7.019E-02	.072	-.087	-.974	.332	-.213	.073	.099	-.092	-.078

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.545[a]	.297	.216	1.2198	.297	3.665	12	104	.000
2	.545[b]	.297	.224	1.2140	.000	.000	1	106	.995
3	.545[c]	.297	.231	1.2083	.000	.005	1	107	.942
4	.545[d]	.297	.238	1.2027	.000	.014	1	108	.907
5	.544[e]	.296	.244	1.1978	-.001	.120	1	109	.729
6	.542[f]	.294	.249	1.1943	-.002	.355	1	110	.552
7	.539[g]	.290	.251	1.1922	-.004	.614	1	111	.435
8	.534[h]	.285	.253	1.1906	-.005	.718	1	112	.399
9	.530[i]	.281	.256	1.1887	-.004	.642	1	113	.425
10	.524[j]	.274	.255	1.1892	-.007	1.090	1	114	.299
11	.512[k]	.262	.249	1.1940	-.012	1.918	1	115	.169

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_1, CAUSE_3, CAUSE_5
d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_3, CAUSE_5
e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_3
f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9
g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9
h. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_6, CAUSE_9
i. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_6, CAUSE_9
j. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_9
k. Predictors: (Constant), CAUSE_2, CAUSE_7
l. Dependent Variable: SCP6

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.442	12	5.453	3.665	.000[a]
	Residual	154.750	104	1.488		
	Total	220.192	116			
2	Regression	65.442	11	5.949	4.037	.000[b]
	Residual	154.751	105	1.474		
	Total	220.192	116			

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	65.434	10	6.543	4.482	.000[c]
	Residual	154.758	106	1.460		
	Total	220.192	116			
4	Regression	65.414	9	7.268	5.025	.000[d]
	Residual	154.779	107	1.447		
	Total	220.192	116			
5	Regression	65.240	8	8.155	5.684	.000[e]
	Residual	154.953	108	1.435		
	Total	220.192	116			
6	Regression	64.730	7	9.247	6.483	.000[f]
	Residual	155.462	109	1.426		
	Total	220.192	116			
7	Regression	63.854	6	10.642	7.488	.000[g]
	Residual	156.338	110	1.421		
	Total	220.192	116			
8	Regression	62.835	5	12.567	8.865	.000[h]
	Residual	157.358	111	1.418		
	Total	220.192	116			
9	Regression	61.925	4	15.481	10.955	.000[i]
	Residual	158.268	112	1.413		
	Total	220.192	116			
10	Regression	60.384	3	20.128	14.233	.000[j]
	Residual	159.808	113	1.414		
	Total	220.192	116			
11	Regression	57.671	2	28.836	20.227	.000[k]
	Residual	162.521	114	1.426		
	Total	220.192	116			

a. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_11, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
b. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_4, CAUSE_1, CAUSE_3, CAUSE_5
c. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_1, CAUSE_3, CAUSE_5
d. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_3, CAUSE_5
e. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9, CAUSE_3
f. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_8, CAUSE_6, CAUSE_9
g. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_10, CAUSE_7, CAUSE_6, CAUSE_9
h. Predictors: (Constant), CAUSE_12, CAUSE_2, CAUSE_7, CAUSE_6, CAUSE_9
i. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_6, CAUSE_9
j. Predictors: (Constant), CAUSE_2, CAUSE_7, CAUSE_9
k. Predictors: (Constant), CAUSE_2, CAUSE_7
l. Dependent Variable: SCP6

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
4	(Constant)		
	CAUSE_2	.547	1.828
	CAUSE_3	.434	2.303
	CAUSE_5	.417	2.398
	CAUSE_6	.459	2.179
	CAUSE_7	.635	1.576
	CAUSE_8	.596	1.678
	CAUSE_9	.553	1.809
	CAUSE_10	.593	1.687
	CAUSE_12	.781	1.280
5	(Constant)		
	CAUSE_2	.569	1.758
	CAUSE_3	.444	2.253
	CAUSE_6	.566	1.767
	CAUSE_7	.635	1.576
	CAUSE_8	.614	1.628
	CAUSE_9	.571	1.750
	CAUSE_10	.671	1.491
	CAUSE_12	.783	1.277
6	(Constant)		
	CAUSE_2	.707	1.415
	CAUSE_6	.606	1.650
	CAUSE_7	.688	1.453
	CAUSE_8	.632	1.582
	CAUSE_9	.585	1.709
	CAUSE_10	.690	1.450
	CAUSE_12	.783	1.277
7	(Constant)		
	CAUSE_2	.733	1.364
	CAUSE_6	.610	1.640
	CAUSE_7	.712	1.404
	CAUSE_9	.619	1.615
	CAUSE_10	.691	1.447
	CAUSE_12	.813	1.230

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_2	.736	1.359
	CAUSE_6	.615	1.626
	CAUSE_7	.713	1.403
	CAUSE_9	.711	1.406
	CAUSE_12	.859	1.164
9	(Constant)		
	CAUSE_2	.741	1.349
	CAUSE_6	.623	1.605
	CAUSE_7	.736	1.359
	CAUSE_9	.735	1.360
10	(Constant)		
	CAUSE_2	.790	1.265
	CAUSE_7	.830	1.204
	CAUSE_9	.806	1.241
11	(Constant)		
	CAUSE_2	.874	1.144
	CAUSE_7	.874	1.144

a. Dependent Variable: SCP6

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
8	(Constant)	2.706	.583		4.640	.000	1.550	3.862			
	CAUSE_2	.114	.073	.147	1.569	.119	-.030	.258	.320	.147	.126
	CAUSE_6	-7.825E-02	.083	-.097	-.946	.346	-.242	.086	.241	-.089	-.076
	CAUSE_7	.359	.076	.447	4.702	.000	.208	.510	.487	.408	.377
	CAUSE_9	.138	.079	.166	1.748	.083	-.018	.294	.306	.164	.140
	CAUSE_12	-5.608E-02	.070	-.069	-.801	.425	-.195	.083	.099	-.076	-.064
9	(Constant)	2.536	.542		4.676	.000	1.461	3.611			
	CAUSE_2	.119	.072	.153	1.648	.102	-.024	.262	.320	.154	.132
	CAUSE_6	-8.571E-02	.082	-.106	-1.044	.299	-.248	.077	.241	-.098	-.084
	CAUSE_7	.348	.075	.433	4.640	.000	.200	.497	.487	.402	.372
	CAUSE_9	.126	.077	.152	1.632	.105	-.027	.279	.306	.152	.131
10	(Constant)	2.510	.542		4.631	.000	1.436	3.584			
	CAUSE_2	.100	.070	.129	1.432	.155	-.038	.239	.320	.133	.11[illegible]
	CAUSE_7	.322	.071	.400	4.553	.000	.182	.462	.487	.394	.36[illegible]
	CAUSE_9	.102	.074	.124	1.385	.169	-.044	.249	.306	.129	.11[illegible]
11	(Constant)	2.962	.434		6.817	.000	2.101	3.823			
	CAUSE_2	.130	.067	.168	1.947	.054	-.002	.263	.320	.179	.15[illegible]
	CAUSE_7	.344	.069	.428	4.968	.000	.207	.481	.487	.422	.40[illegible]

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.465	2.152
	CAUSE_2	.399	2.507
	CAUSE_3	.406	2.466
	CAUSE_4	.421	2.378
	CAUSE_5	.376	2.657
	CAUSE_6	.444	2.250
	CAUSE_7	.610	1.639
	CAUSE_8	.564	1.774
	CAUSE_9	.516	1.938
	CAUSE_10	.538	1.859
	CAUSE_11	.502	1.991
	CAUSE_12	.754	1.326
2	(Constant)		
	CAUSE_1	.476	2.102
	CAUSE_2	.407	2.456
	CAUSE_3	.406	2.461
	CAUSE_4	.429	2.330
	CAUSE_5	.377	2.652
	CAUSE_6	.447	2.237
	CAUSE_7	.629	1.591
	CAUSE_8	.579	1.728
	CAUSE_9	.552	1.813
	CAUSE_10	.561	1.781
	CAUSE_12	.781	1.281
3	(Constant)		
	CAUSE_1	.480	2.083
	CAUSE_2	.430	2.325
	CAUSE_3	.434	2.303
	CAUSE_5	.415	2.412
	CAUSE_6	.449	2.230
	CAUSE_7	.634	1.578
	CAUSE_8	.581	1.721
	CAUSE_9	.553	1.809
	CAUSE_10	.590	1.695
	CAUSE_12	.781	1.281

	CAUSE_1	.617	.452	.323
	CAUSE_2	.624	.413	.325
	CAUSE_3	.500	.555	.316
	CAUSE_4	.631	.530	.221
	CAUSE_5	.424	.165	-.090
	CAUSE_6	.414	.315	.396
	CAUSE_7	.404	.508	.466
	CAUSE_8	.665	.669	.522
	CAUSE_9	.718	.736	.401
	CAUSE_10	1.000	.737	.394
	CAUSE_11	.737	1.000	.731
	CAUSE_12	.394	.731	1.000
Sig. (1-tailed)	SCP6	.012	.003	.000
	CAUSE_1	.001	.012	.058
	CAUSE_2	.000	.020	.057
	CAUSE_3	.006	.002	.062
	CAUSE_4	.000	.003	.144
	CAUSE_5	.017	.216	.335
	CAUSE_6	.020	.063	.025
	CAUSE_7	.023	.005	.009
	CAUSE_8	.000	.000	.004
	CAUSE_9	.000	.000	.023
	CAUSE_10	.	.000	.026
	CAUSE_11	.000	.	.000
	CAUSE_12	.026	.000	.
N	SCP6	25	25	25
	CAUSE_1	25	25	25
	CAUSE_2	25	25	25
	CAUSE_3	25	25	25
	CAUSE_4	25	25	25
	CAUSE_5	25	25	25
	CAUSE_6	25	25	25
	CAUSE_7	25	25	25
	CAUSE_8	25	25	25
	CAUSE_9	25	25	25
	CAUSE_10	25	25	25
	CAUSE_11	25	25	25
	CAUSE_12	25	25	25

	Mean	Std. Deviation	N
SCP6	5.520	1.6676	25
CAUSE_1	6.800	2.2913	25
CAUSE_2	6.680	2.1884	25
CAUSE_3	6.600	2.2913	25
CAUSE_4	6.820	2.3313	25
CAUSE_5	6.700	2.2638	25
CAUSE_6	6.200	2.2958	25
CAUSE_7	5.680	2.0355	25
CAUSE_8	6.400	1.8428	25
CAUSE_9	5.520	2.3826	25
CAUSE_10	6.440	2.0530	25
CAUSE_11	5.320	2.5612	25
CAUSE_12	5.600	2.3629	25

Analysis for Ca-SCP6-CC

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4[a]	.	Enter
2	.	CAUSE_9	Backward (criterion: Probability of F-to-remove >= .100).
3	.	CAUSE_2	Backward (criterion: Probability of F-to-remove >= .100).
4	.	CAUSE_4	Backward (criterion: Probability of F-to-remove >= .100).
5	.	CAUSE_11	Backward (criterion: Probability of F-to-remove >= .100).
6	.	CAUSE_10	Backward (criterion: Probability of F-to-remove >= .100).

Analysis for Ca-SCP6-CC

Correlations

		SCP6	CAUSE_1	CAUSE_2	CAUSE_3	CAUSE_4	CAUSE_5	CAUSE_6	CAUSE_7	CAUSE_8	CAUSE_9
Pearson Correlation	SCP6	1.000	.454	.459	.340	.331	.131	.510	.358	.533	.364
	CAUSE_1	.454	1.000	.942	.571	.835	.651	.440	.316	.405	.386
	CAUSE_2	.459	.942	1.000	.597	.829	.621	.442	.294	.452	.385
	CAUSE_3	.340	.571	.597	1.000	.746	.442	.202	.472	.528	.498
	CAUSE_4	.331	.835	.829	.746	1.000	.747	.281	.251	.388	.389
	CAUSE_5	.131	.651	.621	.442	.747	1.000	.423	-.080	.210	.088
	CAUSE_6	.510	.440	.442	.202	.281	.423	1.000	.277	.510	.155
	CAUSE_7	.358	.316	.294	.472	.251	-.080	.277	1.000	.530	.611
	CAUSE_8	.533	.405	.452	.528	.388	.210	.510	.530	1.000	.748
	CAUSE_9	.364	.386	.385	.498	.389	.088	.155	.611	.748	1.000
	CAUSE_10	.448	.617	.624	.500	.631	.424	.414	.404	.665	.718
	CAUSE_11	.535	.452	.413	.555	.530	.165	.315	.508	.669	.736
	CAUSE_12	.637	.323	.325	.316	.221	-.090	.396	.466	.522	.401
Sig. (1-tailed)	SCP6	.	.011	.011	.048	.053	.266	.005	.039	.003	.037
	CAUSE_1	.011	.	.000	.001	.000	.000	.014	.062	.022	.028
	CAUSE_2	.011	.000	.	.001	.000	.000	.013	.077	.012	.029
	CAUSE_3	.048	.001	.001	.	.000	.014	.166	.009	.003	.006
	CAUSE_4	.053	.000	.000	.000	.	.000	.086	.113	.028	.027
	CAUSE_5	.266	.000	.000	.014	.000	.	.018	.351	.157	.338
	CAUSE_6	.005	.014	.013	.166	.086	.018	.	.090	.005	.229
	CAUSE_7	.039	.062	.077	.009	.113	.351	.090	.	.003	.001
	CAUSE_8	.003	.022	.012	.003	.028	.157	.005	.003	.	.000
	CAUSE_9	.037	.028	.029	.006	.027	.338	.229	.001	.000	.
	CAUSE_10	.012	.001	.000	.006	.000	.017	.020	.023	.000	.000
	CAUSE_11	.003	.012	.020	.002	.003	.216	.063	.005	.000	.000
	CAUSE_12	.000	.058	.057	.062	.144	.335	.025	.009	.004	.023
N	SCP6	25	25	25	25	25	25	25	25	25	25
	CAUSE_1	25	25	25	25	25	25	25	25	25	25
	CAUSE_2	25	25	25	25	25	25	25	25	25	25
	CAUSE_3	25	25	25	25	25	25	25	25	25	25
	CAUSE_4	25	25	25	25	25	25	25	25	25	25
	CAUSE_5	25	25	25	25	25	25	25	25	25	25
	CAUSE_6	25	25	25	25	25	25	25	25	25	25
	CAUSE_7	25	25	25	25	25	25	25	25	25	25
	CAUSE_8	25	25	25	25	25	25	25	25	25	25
	CAUSE_9	25	25	25	25	25	25	25	25	25	25
	CAUSE_10	25	25	25	25	25	25	25	25	25	25
	CAUSE_11	25	25	25	25	25	25	25	25	25	25
	CAUSE_12	25	25	25	25	25	25	25	25	25	25

Analysis for Ca-SCP6-CC

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	35.998	10	3.600	1.639	.193[c]
	Residual	30.742	14	2.196		
	Total	66.740	24			
4	Regression	35.978	9	3.998	1.949	.122[d]
	Residual	30.762	15	2.051		
	Total	66.740	24			
5	Regression	35.967	8	4.496	2.338	.071[e]
	Residual	30.773	16	1.923		
	Total	66.740	24			
6	Regression	35.949	7	5.136	2.835	.037[f]
	Residual	30.791	17	1.811		
	Total	66.740	24			
7	Regression	35.835	6	5.972	3.478	.018[g]
	Residual	30.905	18	1.717		
	Total	66.740	24			
8	Regression	35.563	5	7.113	4.335	.008[h]
	Residual	31.177	19	1.641		
	Total	66.740	24			
9	Regression	35.101	4	8.775	5.547	.004[i]
	Residual	31.639	20	1.582		
	Total	66.740	24			
10	Regression	34.321	3	11.440	7.411	.001[j]
	Residual	32.419	21	1.544		
	Total	66.740	24			
11	Regression	32.337	2	16.169	10.340	.001[k]
	Residual	34.403	22	1.564		
	Total	66.740	24			

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
d. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
e. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_8, CAUSE_1
f. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_8, CAUSE_1
g. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_7, CAUSE_8, CAUSE_1
h. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_8, CAUSE_1
i. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_8, CAUSE_1
j. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_1
k. Predictors: (Constant), CAUSE_12, CAUSE_6
l. Dependent Variable: SCP6

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
7	.	CAUSE_3	Backward (criterion: Probability of F-to-remove >= .100).
8	.	CAUSE_7	Backward (criterion: Probability of F-to-remove >= .100).
9	.	CAUSE_5	Backward (criterion: Probability of F-to-remove >= .100).
10	.	CAUSE_8	Backward (criterion: Probability of F-to-remove >= .100).
11	.	CAUSE_1	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.
b. Dependent Variable: SCP6

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	1.687	1.737		.971	.351	-2.097	5.471			
	CAUSE_1	.187	.492	.257	.380	.711	-.885	1.258	.454	.109	.074
	CAUSE_2	-1.232E-02	.571	-.016	-.022	.983	-1.256	1.231	.459	-.006	-.004
	CAUSE_3	4.026E-02	.268	.055	.150	.883	-.544	.624	.340	.043	.029
	CAUSE_4	4.284E-02	.509	.060	.084	.934	-1.066	1.152	.331	.024	.016
	CAUSE_5	-.163	.324	-.222	-.503	.624	-.870	.544	.131	-.144	-.099
	CAUSE_6	.192	.249	.264	.770	.456	-.351	.735	.510	.217	.151
	CAUSE_7	-8.643E-02	.257	-.105	-.336	.742	-.646	.473	.358	-.097	-.066
	CAUSE_8	.139	.369	.154	.376	.713	-.666	.944	.533	.108	.074
	CAUSE_9	-2.784E-03	.345	-.004	-.008	.994	-.754	.749	.364	-.002	-.002
	CAUSE_10	3.462E-02	.340	.043	.102	.921	-.707	.776	.448	.029	.020
	CAUSE_11	-3.147E-02	.421	-.048	-.075	.942	-.948	.885	.535	-.022	-.015
	CAUSE_12	.277	.304	.393	.913	.379	-.385	.939	.637	.255	[illegible]
2	(Constant)	1.687	1.669		1.011	.330	-1.918	5.291			
	CAUSE_1	.186	.471	.256	.396	.699	-.832	1.205	.454	.109	[illegible]
	CAUSE_2	-1.303E-02	.542	-.017	-.024	.981	-1.183	1.157	.459	-.007	[illegible]
	CAUSE_3	4.031E-02	.257	.055	.157	.878	-.516	.596	.340	.043	[illegible]
	CAUSE_4	4.408E-02	.466	.062	.095	.926	-.963	1.051	.331	.026	[illegible]
	CAUSE_5	-.164	.311	-.222	-.527	.607	-.835	.508	.131	-.145	[illegible]
	CAUSE_6	.193	.212	.256	.910	.379	-.265	.651	.510	.245	[illegible]
	CAUSE_7	-8.731E-02	.224	-.107	-.391	.702	-.570	.396	.358	-.108	[illegible]
	CAUSE_8	.138	.302	.152	.455	.657	-.515	.790	.533	.125	[illegible]
	CAUSE_10	3.402E-02	.319	.042	.107	.917	-.655	.723	.448	.030	[illegible]
	CAUSE_11	-3.306E-02	.357	-.051	-.093	.928	-.804	.738	.535	-.026	-.017
	CAUSE_12	.278	.268	.394	1.037	.319	-.301	.858	.637	.276	.195
3	(Constant)	1.691	1.597		1.059	.308	-1.734	5.117			
	CAUSE_1	.178	.293	.244	.608	.553	-.450	.805	.454	.160	.110
	CAUSE_3	3.976E-02	.247	.055	.161	.874	-.490	.570	.340	.043	.029
	CAUSE_4	3.971E-02	.414	.056	.096	.925	-.848	.927	.331	.026	.017
	CAUSE_5	-.162	.289	-.219	-.560	.584	-.781	.457	.131	-.148	-.102
	CAUSE_6	.192	.203	.265	.946	.360	-.244	.628	.510	.245	.172
	CAUSE_7	-8.630E-02	.212	-.105	-.408	.690	-.540	.368	.358	-.108	-.074
	CAUSE_8	.136	.281	.150	.482	.637	-.467	.738	.533	.128	.088
	CAUSE_10	3.166E-02	.292	.039	.108	.915	-.595	.659	.448	.029	.020
	CAUSE_11	-2.864E-02	.295	-.044	-.097	.924	-.661	.603	.535	-.026	-.018
	CAUSE_12	.276	.245	.391	1.126	.279	-.250	.802	.637	.298	.204

Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.734[a]	.539	.079	1.6005	.539	1.171	12	12	.394
2	.734[b]	.539	.150	1.5377	.000	.000	1	14	.994
3	.734[c]	.539	.210	1.4818	.000	.001	1	15	.981
4	.734[d]	.539	.263	1.4321	.000	.009	1	16	.925
5	.734[e]	.539	.308	1.3868	.000	.005	1	17	.943
6	.734[f]	.539	.349	1.3458	.000	.009	1	18	.924
7	.733[g]	.537	.383	1.3103	-.002	.063	1	19	.804
8	.730[h]	.533	.410	1.2810	-.004	.158	1	20	.696
9	.725[i]	.526	.431	1.2578	-.007	.282	1	21	.602
10	.717[j]	.514	.445	1.2425	-.012	.493	1	22	.491
11	.696[k]	.485	.438	1.2505	-.030	1.285	1	23	.270

a. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_9, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
b. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_2, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
c. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1, CAUSE_4
d. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_8, CAUSE_11, CAUSE_1
e. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_10, CAUSE_8, CAUSE_1
f. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_3, CAUSE_7, CAUSE_8, CAUSE_1
g. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_7, CAUSE_8, CAUSE_1
h. Predictors: (Constant), CAUSE_12, CAUSE_5, CAUSE_6, CAUSE_8, CAUSE_1
i. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_8, CAUSE_1
j. Predictors: (Constant), CAUSE_12, CAUSE_6, CAUSE_1
k. Predictors: (Constant), CAUSE_12, CAUSE_6
l. Dependent Variable: SCP6

ANOVA[l]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.000	12	3.000	1.171	.394[a]
	Residual	30.740	12	2.562		
	Total	66.740	24			
2	Regression	36.000	11	3.273	1.384	.285[b]
	Residual	30.740	13	2.365		
	Total	66.740	24			

Model		Tolerance	VIF
1	(Constant)		
	CAUSE_1	.084	11.893
	CAUSE_2	.068	14.614
	CAUSE_3	.283	3.532
	CAUSE_4	.076	13.197
	CAUSE_5	.198	5.056
	CAUSE_6	.326	3.070
	CAUSE_7	.390	2.561
	CAUSE_8	.230	4.342
	CAUSE_9	.158	6.328
	CAUSE_10	.219	4.569
	CAUSE_11	.092	10.874
	CAUSE_12	.207	4.827
2	(Constant)		
	CAUSE_1	.084	11.839
	CAUSE_2	.070	14.263
	CAUSE_3	.283	3.529
	CAUSE_4	.083	11.984
	CAUSE_5	.199	5.021
	CAUSE_6	.416	2.401
	CAUSE_7	.476	2.102
	CAUSE_8	.318	3.148
	CAUSE_10	.230	4.348
	CAUSE_11	.118	8.474
	CAUSE_12	.245	4.081
3	(Constant)		
	CAUSE_1	.204	4.910
	CAUSE_3	.286	3.501
	CAUSE_4	.098	10.166
	CAUSE_5	.214	4.665
	CAUSE_6	.420	2.381
	CAUSE_7	.493	2.029
	CAUSE_8	.341	2.932
	CAUSE_10	.254	3.936
	CAUSE_11	.161	6.226
	CAUSE_12	.272	3.670

Model		Collinearity Statistics Tolerance	VIF
4	(Constant)		
	CAUSE_1	.325	3.072
	CAUSE_3	.389	2.572
	CAUSE_5	.288	3.468
	CAUSE_6	.449	2.228
	CAUSE_7	.494	2.023
	CAUSE_8	.353	2.833
	CAUSE_10	.255	3.920
	CAUSE_11	.179	5.575
	CAUSE_12	.276	3.620
5	(Constant)		
	CAUSE_1	.340	2.943
	CAUSE_3	.411	2.431
	CAUSE_5	.292	3.430
	CAUSE_6	.478	2.092
	CAUSE_7	.496	2.016
	CAUSE_8	.356	2.806
	CAUSE_10	.400	2.501
	CAUSE_12	.514	1.945
6	(Constant)		
	CAUSE_1	.374	2.675
	CAUSE_3	.414	2.413
	CAUSE_5	.300	3.328
	CAUSE_6	.485	2.062
	CAUSE_7	.500	1.999
	CAUSE_8	.463	2.160
	CAUSE_12	.518	1.932
7	(Constant)		
	CAUSE_1	.381	2.623
	CAUSE_5	.361	2.774
	CAUSE_6	.577	1.733
	CAUSE_7	.582	1.719
	CAUSE_8	.516	1.939
	CAUSE_12	.531	1.894

Coefficients[a]

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
4	(Constant)	1.695	1.543		1.098	.289	-1.594	4.984			
	CAUSE_1	.195	.224	.268	.872	.397	-.282	.672	.454	.220	.153
	CAUSE_3	5.197E-02	.205	.071	.254	.803	-.384	.488	.340	.065	.045
	CAUSE_5	-.148	.240	-.200	-.614	.549	-.660	.365	.131	-.156	-.108
	CAUSE_6	.187	.190	.258	.986	.340	-.218	.592	.510	.247	.173
	CAUSE_7	-8.739E-02	.204	-.107	-.428	.675	-.523	.348	.358	-.110	-.075
	CAUSE_8	.131	.267	.144	.489	.632	-.438	.700	.533	.125	.086
	CAUSE_10	3.344E-02	.282	.041	.119	.907	-.567	.634	.448	.031	.021
	CAUSE_11	-1.950E-02	.269	-.030	-.072	.943	-.594	.555	.535	-.019	-.013
	CAUSE_12	.273	.235	.388	1.162	.263	-.228	.775	.637	.287	.204
5	(Constant)	1.743	1.346		1.296	.213	-1.109	4.596			
	CAUSE_1	.198	.212	.272	.936	.363	-.251	.648	.454	.228	[illegible]
	CAUSE_3	4.850E-02	.193	.067	.252	.804	-.360	.457	.340	.063	[illegible]
	CAUSE_5	-.149	.232	-.203	-.645	.528	-.640	.342	.131	-.159	[illegible]
	CAUSE_6	.191	.178	.263	1.070	.300	-.187	.569	.510	.258	[illegible]
	CAUSE_7	-8.825E-02	.197	-.108	-.447	.661	-.507	.330	.358	-.111	[illegible]
	CAUSE_8	.129	.257	.142	.500	.624	-.417	.674	.533	.124	[illegible]
	CAUSE_10	2.117E-02	.218	.026	.097	.924	-.441	.483	.448	.024	[illegible]
	CAUSE_12	.262	.167	.371	1.567	.137	-.092	.616	.637	.365	[illegible]
6	(Constant)	1.741	1.305		1.333	.200	-1.014	4.495			
	CAUSE_1	.205	.196	.281	1.043	.312	-.209	.618	.454	.245	[illegible]
	CAUSE_3	4.683E-02	.186	.064	.252	.804	-.346	.440	.340	.061	[illegible]
	CAUSE_5	-.146	.221	-.198	-.657	.520	-.613	.322	.131	-.157	[illegible]
	CAUSE_6	.189	.172	.260	1.099	.287	-.174	.551	.510	.257	.181
	CAUSE_7	-8.646E-02	.191	-.106	-.453	.656	-.489	.316	.358	-.109	-.075
	CAUSE_8	.141	.219	.156	.642	.529	-.321	.603	.533	.154	.106
	CAUSE_12	.263	.162	.373	1.629	.122	-.078	.604	.637	.367	.268
7	(Constant)	1.707	1.265		1.350	.194	-.949	4.364			
	CAUSE_1	.211	.189	.290	1.118	.278	-.186	.609	.454	.255	.179
	CAUSE_5	-.123	.197	-.167	-.624	.540	-.536	.291	.131	-.146	-.100
	CAUSE_6	.171	.153	.236	1.118	.278	-.151	.494	.510	.255	.179
	CAUSE_7	-6.849E-02	.172	-.084	-.398	.696	-.430	.293	.358	-.093	-.064
	CAUSE_8	.158	.202	.175	.784	.443	-.266	.583	.533	.182	.126
	CAUSE_12	.270	.155	.382	1.735	.100	-.057	.596	.637	.379	.278

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part
8	(Constant)	1.537	1.163		1.322	.202	-.898	3.972			
	CAUSE_1	.188	.175	.258	1.070	.298	-.179	.554	.454	.238	.168
	CAUSE_5	-9.582E-02	.181	-.130	-.531	.602	-.474	.282	.131	-.121	-.083
	CAUSE_6	.168	.150	.231	1.121	.276	-.145	.481	.510	.249	.176
	CAUSE_8	.128	.183	.142	.701	.492	-.255	.512	.533	.159	.110
	CAUSE_12	.266	.152	.376	1.752	.096	-.052	.583	.637	.373	.275
9	(Constant)	1.282	1.040		1.233	.232	-.887	3.452			
	CAUSE_1	.126	.129	.173	.977	.340	-.143	.395	.454	.213	.150
	CAUSE_6	.140	.137	.192	1.017	.321	-.147	.427	.510	.222	.157
	CAUSE_8	.126	.180	.140	.702	.491	-.249	.502	.533	.155	.108
	CAUSE_12	.305	.130	.432	2.344	.030	.034	.576	.637	.464	.361
10	(Constant)	1.598	.926		1.725	.099	-.328	3.525			
	CAUSE_1	.142	.125	.195	1.134	.270	-.119	.403	.454	.240	[illegible]
	CAUSE_6	.170	.129	.234	1.322	.200	-.098	.438	.510	.277	[illegible]
	CAUSE_12	.339	.119	.481	2.855	.009	.092	.586	.637	.529	[illegible]
11	(Constant)	2.103	.818		2.572	.017	.407	3.799			
	CAUSE_6	.223	.121	.307	1.840	.079	-.028	.474	.510	.365	[illegible]
	CAUSE_12	.364	.118	.515	3.092	.005	.120	.608	.637	.550	[illegible]

Analysis for Ca-SCP6-CC

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
8	(Constant)		
	CAUSE_1	.424	2.360
	CAUSE_5	.409	2.444
	CAUSE_6	.579	1.726
	CAUSE_8	.599	1.670
	CAUSE_12	.533	1.876
9	(Constant)		
	CAUSE_1	.756	1.324
	CAUSE_6	.662	1.512
	CAUSE_8	.599	1.669
	CAUSE_12	.699	1.431
10	(Constant)		
	CAUSE_1	.780	1.282
	CAUSE_6	.735	1.361
	CAUSE_12	.816	1.226
11	(Constant)		
	CAUSE_6	.844	1.185
	CAUSE_12	.844	1.185

a. Dependent Variable: SCP6

APPENDIX R

Neural network analysis outputs for the causes to the site coordination problems analysis

Neural network output of Ca-SCP1-AR-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.07691431	0.42308569
2	3	3.828403711	-0.828403711
3	3.5	4.381679058	-0.881679058
4	5	4.468717098	0.531282902
5	6	3.828403711	2.171596289
6	8	5.849462986	2.150537014
7	8.5	6.717654705	1.782345295
8	5.5	4.88835001	0.61164999
9	6	6.59949255	-0.59949255
10	4	5.432518959	-1.432518959
11	6	5.275869846	0.724130154
12	7	4.3800807	2.6199193
13	3	3.828403711	-0.828403711
14	4	3.660653591	0.339346409
15	4.5	3.454020739	1.045979261
16	4.5	4.347862244	0.152137756
17	6	6.625629902	-0.625629902
18	4	4.034658432	-0.034658432
19	4	3.783781767	0.216218233
20	7	3.660653591	3.339346409
21	8	7.868601799	0.131398201
22	2	4.014099121	-2.014099121
23	6	5.603452682	0.396547318
24	4.5	4.300260544	0.199739456
25	5.5	5.727348804	-0.227348804
26	5.5	4.759337425	0.740662575
27	5.5	3.930811167	1.569188833
28	6	5.80358839	0.19641161
29	5.5	6.242172241	-0.742172241
30	4.5	4.534541607	-0.034541607
31	4	3.868234634	0.131765366
32	5.5	4.865708351	0.634291649
33	8	7.019786358	0.980213642
34	7	6.211081505	0.788918495
35	5.5	6.232952595	-0.732952595
36	3	4.564575672	-1.564575672
37	7	6.153251171	0.846748829
38	5	5.881575108	-0.881575108
39	10	6.35013628	3.64986372
40	5.5	6.138149261	-0.638149261
41	6	6.281237602	-0.281237602

42	6.5	6.750239849	-0.250239849
43	5	5.88468504	-0.88468504
44	6.5	5.841594696	0.658405304
45	3	4.002323151	-1.002323151
46	6	5.084234715	0.915765285
47	6	5.084234715	0.915765285
48	4	5.75360775	-1.75360775
49	4	4.551624298	-0.551624298
50	6	5.42246151	0.57753849
51	4	5.066853523	-1.066853523
52	3	3.473022699	-0.473022699
53	7	7.650784969	-0.650784969
54	3	4.943635464	-1.943635464
55	3	5.42246151	-2.42246151
56	6	6.822966576	-0.822966576
57	7	7.650784969	-0.650784969
58	4	5.932788372	-1.932788372
59	1	3.681824446	-2.681824446
60	5	6.407808304	-1.407808304
61	3	3.791001797	-0.791001797
62	6	5.762895107	0.237104893
63	3	4.641020775	-1.641020775
64	5	6.567374229	-1.567374229
65	6.5	5.127837181	1.372162819
66	7	7.06997776	-0.06997776
67	6	5.023880005	0.976119995
68	5.5	5.603452682	-0.103452682
69	4.5	5.559782505	-1.059782505
70	7	6.567374229	0.432625771
71	4	4.911297798	-0.911297798
72	4	5.066853523	-1.066853523
73	6	5.016934395	0.983065605
74	8	7.830144882	0.169855118
75	6.5	6.652713299	-0.152713299
76	7.5	6.516901016	0.983098984
77	6.5	6.841931343	-0.341931343
78	4	5.644864082	-1.644864082
79	5	6.686009884	-1.686009884
80	4	4.943635464	-0.943635464
81	5.5	4.464291573	1.035708427
82	5	5.762895107	-0.762895107
83	5	5.620375156	-0.620375156
84	3	5.238035202	-2.238035202
85	5	5.251217365	-0.251217365

86	5	5.567474365	-0.567474365
87	6	5.665632248	0.334367752
88	6	5.762895107	0.237104893
89	5	5.147759914	-0.147759914
90	6	5.269696236	0.730303764
91	4	5.695134163	-1.695134163
92	5	5.332587242	-0.332587242
93	5	5.025410175	-0.025410175
94	4	5.354754448	-1.354754448
95	5.5	5.251217365	0.248782635
96	6.5	5.92114687	0.57885313
97	3	4.575924397	-1.575924397
98	4.5	4.498464108	0.001535892
99	7	5.700944901	1.299055099
100	4	6.567374229	-2.567374229
101	5	5.24929285	-0.24929285
102	4	4.714236259	-0.714236259
103	2	4.226775646	-2.226775646
104	7	5.371834755	1.628165245
105	7	4.836798191	2.163201809
106	5	4.203698158	0.796301842
107	7	5.363753319	1.636246681
108	3	3.453892946	-0.453892946
109	9	5.666967869	3.333032131
110	4	4.564575672	-0.564575672
111	5	3.788686275	1.211313725
112	3	4.339149475	-1.339149475
113	3	4.640492439	-1.640492439
114	6.5	5.272386074	1.227613926
115	5	4.436934948	0.563065052
116	5	5.020186901	-0.020186901
117	4	4.907984734	-0.907984734
118	4	3.98063302	0.01936698
119	5	4.666623592	0.333376408
120	4.5	4.791265488	-0.291265488
121	4.5	4.285047054	0.214952946
122	3	4.742293358	-1.742293358
123	3	4.453016281	-1.453016281
124	5	5.762895107	-0.762895107
125	5	5.720389366	-0.720389366
126	5	5.526572704	-0.526572704
127	5	4.959992886	0.040007114
128	3	4.85826683	-1.85826683
129	6	5.425867081	0.574132919

130	5	5.332587242	-0.332587242
131	5.5	5.251217365	0.248782635
132	5	4.926557064	0.073442936
133	5	5.762895107	-0.762895107
134	4.5	5.144394398	-0.644394398
135	5	5.033098698	-0.033098698
136	5	5.508043289	-0.508043289
137	4.5	5.371834755	-0.871834755
138	5	4.943635464	0.056364536
139	4	5.145452023	-1.145452023
140	5	5.352808952	-0.352808952
141	5	5.302939892	-0.302939892
142	7	5.992907047	1.007092953
143	5	5.050529957	-0.050529957
144	4	5.56563282	-1.56563282
145	5	6.041603088	-1.041603088
146	5	5.414660931	-0.414660931
147	4.5	5.430523872	-0.930523872
148	5	5.547374725	-0.547374725
149	3	3.858296156	-0.858296156
150	4	6.058650017	-2.058650017
151	5	4.490427494	0.509572506
152	7.5	4.759337425	2.740662575
153	4	4.666800022	-0.666800022
154	4.5	5.463713646	-0.963713646
155	8.5	4.121291161	4.378708839
156	2	4.852812767	-2.852812767
157	1	3.660653591	-2.660653591
158	2	3.775623798	-1.775623798
159	1	4.213211536	-3.213211536
160	5	5.649042606	-0.649042606
161	5.5	5.642882347	-0.142882347
162	6	5.827336311	0.172663689
163	5.5	5.422783375	0.077216625
164	5	4.921658516	0.078341484
165	6	5.56563282	0.43436718
166	5	5.644864082	-0.644864082
167	7	5.762363911	1.237636089
168	5	5.559782505	-0.559782505
169	5	5.354754448	-0.354754448
170	4	5.776724815	-1.776724815
171	6	5.476445198	0.523554802
172	5.5	5.637670994	-0.137670994
173	6.5	6.004254818	0.495745182

174	5.5	5.476445198	0.023554802
175	5	5.285458565	-0.285458565
176	5	5.628871441	-0.628871441
177	4.5	5.531198025	-1.031198025
178	5	5.372784615	-0.372784615
179	4	4.322140694	-0.322140694
180	7	6.509223938	0.490776062
181	7	4.997348309	2.002651691
182	6	5.221764565	0.778235435
183	5	5.42246151	-0.42246151
184	2	3.472475767	-1.472475767
185	4	5.016934395	-1.016934395
186	6	5.228559971	0.771440029
187	6	5.481532574	0.518467426
188	5	6.254105091	-1.254105091
189	3.5	3.635151625	-0.135151625
190	8	6.35013628	1.64986372
191	5	4.305543423	0.694456577
192	5	5.084234715	-0.084234715
193	4	3.807290316	0.192709684
194	5	3.807290316	1.192709684
195	8	6.232952595	1.767047405
196	3	4.917127609	-1.917127609
197	7	4.464291573	2.535708427

Neural network output of Ca-SCP1-AR-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	3.834539413	0.665460587
2	3	3.601975441	-0.601975441
3	3.5	4.239492416	-0.739492416
4	5	4.534487724	0.465512276
5	6	4.008879662	1.991120338
6	8	6.441146851	1.558853149
7	8.5	6.788043976	1.711956024
8	5.5	5.364781857	0.135218143
9	6	6.652636528	-0.652636528
10	4	5.23118782	-1.23118782
11	6	5.1452775	0.8547225
12	7	5.423746109	1.576253891
13	3	3.486235857	-0.486235857
14	4	3.610060692	0.389939308
15	4.5	3.206361055	1.293638945
16	4.5	4.521072865	-0.021072865
17	6	6.602045059	-0.602045059
18	4	3.901880741	0.098119259
19	4	3.59445262	0.40554738
20	7	3.768090963	3.231909037
21	8	7.677997589	0.322002411
22	2	4.644546509	-2.644546509
23	6	5.90747261	0.09252739
24	4.5	3.606713533	0.893286467
25	5.5	5.710269451	-0.210269451
26	5.5	4.911800385	0.588199615
27	5.5	3.814383984	1.685616016
28	6	5.725121975	0.274878025
29	5.5	6.386885643	-0.886885643
30	4.5	4.417686939	0.082313061
31	4	3.640757561	0.359242439
32	5.5	5.112279415	0.387720585
33	8	7.037583351	0.962416649
34	7	6.373610973	0.626389027
35	5.5	6.260994434	-0.760994434
36	3	4.812043667	-1.812043667
37	7	6.881937981	0.118062019
38	5	6.161071777	-1.161071777
39	10	6.584045887	3.415954113
40	5.5	6.295330048	-0.795330048
41	6	6.456028461	-0.456028461

42	6.5	6.682763577	-0.182763577
43	5	5.986295223	-0.986295223
44	6.5	6.524164677	-0.024164677
45	3	3.973739147	-0.973739147
46	6	5.209518433	0.790481567
47	6	5.481466293	0.518533707
48	4	5.650520802	-1.650520802
49	4	4.497632027	-0.497632027
50	6	5.483691216	0.516308784
51	4	5.135707855	-1.135707855
52	3	3.764050961	-0.764050961
53	7	7.003359318	-0.003359318
54	3	4.771690369	-1.771690369
55	3	5.445531368	-2.445531368
56	6	6.910124302	-0.910124302
57	7	7.975348473	-0.975348473
58	4	5.748865604	-1.748865604
59	1	3.445415497	-2.445415497
60	5	6.224830151	-1.224830151
61	3	3.20675683	-0.20675683
62	6	5.798559189	0.201440811
63	3	4.604965687	-1.604965687
64	5	6.625731945	-1.625731945
65	6.5	5.038610458	1.461389542
66	7	7.441948891	-0.441948891
67	6	5.626206398	0.373793602
68	5.5	5.945224762	-0.445224762
69	4.5	5.962449551	-1.462449551
70	7	6.61332798	0.38667202
71	4	4.898539066	-0.898539066
72	4	4.631759167	-0.631759167
73	6	5.052081108	0.947918892
74	8	7.22050333	0.77949667
75	6.5	6.61604023	-0.11604023
76	7.5	5.960336208	1.539663792
77	6.5	6.733515739	-0.233515739
78	4	5.711940289	-1.711940289
79	5	7.001634598	-2.001634598
80	4	4.786885738	-0.786885738
81	5.5	4.569930077	0.930069923
82	5	5.516786575	-0.516786575
83	5	5.658553123	-0.658553123
84	3	5.325266361	-2.325266361
85	5	5.037067413	-0.037067413

86	5	5.558041096	-0.558041096
87	6	5.687648296	0.312351704
88	6	5.936135769	0.063864231
89	5	5.25139761	-0.25139761
90	6	5.335121155	0.664878845
91	4	6.259588718	-2.259588718
92	5	5.41920805	-0.41920805
93	5	4.771522045	0.228477955
94	4	5.335576534	-1.335576534
95	5.5	5.034899235	0.465100765
96	6.5	5.762748718	0.737251282
97	3	5.020241261	-2.020241261
98	4.5	4.423054695	0.076945305
99	7	5.702142715	1.297857285
100	4	6.78168726	-2.78168726
101	5	5.011079311	-0.011079311
102	4	4.661090851	-0.661090851
103	2	3.569127321	-1.569127321
104	7	5.584769249	1.415230751
105	7	5.26566267	1.73433733
106	5	4.646937847	0.353062153
107	7	5.362696648	1.637303352
108	3	4.298987389	-1.298987389
109	9	5.822114944	3.177885056
110	4	4.472941399	-0.472941399
111	5	3.802003384	1.197996616
112	3	3.884445906	-0.884445906
113	3	4.145517826	-1.145517826
114	6.5	5.238687515	1.261312485
115	5	4.903161049	0.096838951
116	5	4.992769241	0.007230759
117	4	4.871521473	-0.871521473
118	4	3.629784346	0.370215654
119	5	4.835861683	0.164138317
120	4.5	4.534332275	-0.034332275
121	4.5	4.287097454	0.212902546
122	3	4.669136524	-1.669136524
123	3	4.8282547	-1.8282547
124	5	5.865481377	-0.865481377
125	5	6.101934433	-1.101934433
126	5	5.406337738	-0.406337738
127	5	5.13445425	-0.13445425
128	3	4.102403164	-1.102403164
129	6	5.509902954	0.490097046

130	5	5.111120224	-0.111120224
131	5.5	5.168012142	0.331987858
132	5	5.182499886	-0.182499886
133	5	5.920605659	-0.920605659
134	4.5	5.254962921	-0.754962921
135	5	5.065310955	-0.065310955
136	5	5.314482689	-0.314482689
137	4.5	5.54521656	-1.04521656
138	5	5.315047264	-0.315047264
139	4	5.487260818	-1.487260818
140	5	5.497627258	-0.497627258
141	5	5.018959522	-0.018959522
142	7	6.270445824	0.729554176
143	5	5.186611652	-0.186611652
144	4	5.630034447	-1.630034447
145	5	5.897065163	-0.897065163
146	5	5.477042198	-0.477042198
147	4.5	5.385046959	-0.885046959
148	5	5.487203121	-0.487203121
149	3	3.787641525	-0.787641525
150	4	6.190672874	-2.190672874
151	5	4.778308392	0.221691608
152	7.5	4.884274483	2.615725517
153	4	4.000555992	-0.000555992
154	4.5	5.318244934	-0.818244934
155	8.5	4.527324677	3.972675323
156	2	4.803845882	-2.803845882
157	1	3.87485218	-2.87485218
158	2	3.652634144	-1.652634144
159	1	3.863803625	-2.863803625
160	5	6.022220612	-1.022220612
161	5.5	5.604941845	-0.104941845
162	6	5.785904408	0.214095592
163	5.5	5.576463699	-0.076463699
164	5	5.091519356	-0.091519356
165	6	5.751199722	0.248800278
166	5	5.4516716	-0.4516716
167	7	6.246901035	0.753098965
168	5	5.639733315	-0.639733315
169	5	5.26864481	-0.26864481
170	4	5.48692894	-1.48692894
171	6	5.850766182	0.149233818
172	5.5	5.86694622	-0.36694622
173	6.5	6.070007324	0.429992676

174	5.5	5.26313591	0.23686409
175	5	5.401152134	-0.401152134
176	5	5.76592207	-0.76592207
177	4.5	5.699860573	-1.199860573
178	5	6.024675369	-1.024675369
179	4	4.004262924	-0.004262924
180	7	6.566257	0.433743
181	7	5.525979042	1.474020958
182	6	5.129974842	0.870025158
183	5	5.407452106	-0.407452106
184	2	3.014759302	-1.014759302
185	4	5.116139889	-1.116139889
186	6	5.246771336	0.753228664
187	6	5.472651482	0.527348518
188	5	6.130567551	-1.130567551
189	3.5	3.173277617	0.326722383
190	8	6.640258789	1.359741211
191	5	4.242139816	0.757860184
192	5	4.840325832	0.159674168
193	4	3.43144536	0.56855464
194	5	3.454949379	1.545050621
195	8	6.531142235	1.468857765
196	3	4.787133217	-1.787133217
197	7	4.809681416	2.190318584

Neural network output of Ca-SCP1-SC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5.5	4.149231911	1.350768089
2	5	5.117958546	-0.117958546
3	5	5.019765854	-0.019765854
4	3	4.548175812	-1.548175812
5	5	4.727169514	0.272830486
6	5	4.991176605	0.008823395
7	6	4.890583038	1.109416962
8	6	5.117958546	0.882041454
9	5	4.616878033	0.383121967
10	6	4.715612411	1.284387589
11	4	5.179959297	-1.179959297
12	5	4.715612411	0.284387589
13	5	4.684858322	0.315141678
14	4	4.684858322	-0.684858322
15	5.5	4.727169514	0.772830486
16	6.5	4.794406414	1.705593586
17	3	4.123225689	-1.123225689
18	4.5	4.224894524	0.275105476
19	7	4.788444996	2.211555004
20	4	5.42690897	-1.42690897
21	5	4.860840797	0.139159203
22	4	4.366512775	-0.366512775
23	2	3.970868826	-1.970868826
24	7	4.919921398	2.080078602
25	7	4.4414258	2.5585742
26	5	4.012584209	0.987415791
27	7	4.890583038	2.109416962
28	3	3.126245022	-0.126245022
29	9	5.012719154	3.987280846
30	4	4.157355785	-0.157355785
31	5	3.4915061	1.5084939
32	3	4.081338406	-1.081338406
33	3	4.216189384	-1.216189384
34	6.5	4.812144756	1.687855244
35	5	4.012584209	0.987415791
36	5	4.548175812	0.451824188
37	4	4.51101017	-0.51101017
38	4	3.713862181	0.286137819
39	5	4.081338406	0.918661594
40	4.5	4.224894524	0.275105476
41	4.5	3.929257393	0.570742607

42	3	4.366512775	-1.366512775
43	3	4.073521137	-1.073521137
44	5	5.117958546	-0.117958546
45	5	4.955613613	0.044386387
46	5	5.117958546	-0.117958546
47	5	4.408768177	0.591231823
48	3	4.157355785	-1.157355785
49	6	4.788444996	1.211555004
50	5	4.715612411	0.284387589
51	5.5	4.727169514	0.772830486
52	5	4.50579977	0.49420023
53	5	5.117958546	-0.117958546
54	4.5	4.51101017	-0.01101017
55	5	4.516086102	0.483913898
56	5	4.788444996	0.211555004
57	4.5	4.919921398	-0.419921398
58	5	4.4414258	0.5585742
59	4	4.648142338	-0.648142338
60	5	4.788444996	0.211555004
61	5	4.991176605	0.008823395
62	7	5.090141773	1.909858227
63	5	4.752079487	0.247920513
64	4	4.854602337	-0.854602337
65	5	5.152756214	-0.152756214
66	5	4.884108067	0.115891933
67	4.5	4.548175812	-0.048175812
68	5	4.984373569	0.015626431
69	3	3.488942146	-0.488942146
70	4	5.309114933	-1.309114933
71	5	4.233265877	0.766734123
72	7.5	4.4414258	3.0585742
73	4	4.295971394	-0.295971394
74	4.5	4.848179817	-0.348179817
75	8.5	3.783847332	4.716152668
76	2	4.50579977	-2.50579977
77	1	3.345570087	-2.345570087
78	2	3.418465614	-1.418465614
79	1	3.860003948	-2.860003948
80	5	4.932741165	0.067258835
81	5.5	5.187401772	0.312598228
82	6	4.991176605	1.008823395
83	5.5	4.919921398	0.580078602
84	5	4.366512775	0.633487225
85	6	4.854602337	1.145397663

86	5	4.991176605	0.008823395
87	7	5.214428425	1.785571575
88	5	4.75799799	0.24200201
89	5	4.684858322	0.315141678
90	4	4.926440239	-0.926440239
91	6	4.818506718	1.181493282
92	5.5	5.090141773	0.409858227
93	6.5	4.926440239	1.573559761
94	5.5	4.818506718	0.681493282
95	5	4.782301903	0.217698097
96	5	5.117958546	-0.117958546
97	4.5	4.860840797	-0.360840797
98	5	4.860840797	0.139159203
99	4	4.005282402	-0.005282402
100	7	5.376556396	1.623443604
101	7	4.653739452	2.346260548
102	6	4.450920582	1.549079418
103	5	4.727169514	0.272830486
104	2	3.20046401	-1.20046401
105	4	4.642403126	-0.642403126
106	6	4.653739452	1.346260548
107	6	4.919921398	1.080078602
108	5	5.309114933	-0.309114933
109	3.5	3.345570087	0.154429913
110	8	5.42690897	2.57309103
111	5	3.929257393	1.070742607
112	5	4.4414258	0.5585742
113	4	3.567345858	0.432654142
114	5	3.567345858	1.432654142
115	8	5.241008759	2.758991241
116	3	4.548175812	-1.548175812
117	7	4.149231911	2.850768089

Neural network output of Ca-SCP1-SC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5.5	3.917281628	1.582718372
2	5	5.022014141	-0.022014141
3	5	5.021278858	-0.021278858
4	3	4.570822239	-1.570822239
5	5	4.57212162	0.42787838
6	5	4.910902023	0.089097977
7	6	4.82679224	1.17320776
8	6	5.195596695	0.804403305
9	5	4.441923141	0.558076859
10	6	4.559606075	1.440393925
11	4	5.047578812	-1.047578812
12	5	4.667279243	0.332720757
13	5	4.427899361	0.572100639
14	4	4.745349884	-0.745349884
15	5.5	4.443550587	1.056449413
16	6.5	4.885596275	1.614403725
17	3	4.01456213	-1.01456213
18	4.5	3.867930174	0.632069826
19	7	4.958799362	2.041200638
20	4	5.829636574	-1.829636574
21	5	4.667276382	0.332723618
22	4	4.09939146	-0.09939146
23	2	3.303741217	-1.303741217
24	7	4.841669559	2.158330441
25	7	4.2008214	2.7991786
26	5	3.897466183	1.102533817
27	7	4.938503265	2.061496735
28	3	2.973790169	0.026209831
29	9	5.238014698	3.761985302
30	4	3.728948832	0.271051168
31	5	3.053287029	1.946712971
32	3	3.557204008	-0.557204008
33	3	3.462746382	-0.462746382
34	6.5	4.605958462	1.894041538
35	5	3.967979193	1.032020807
36	5	4.454782486	0.545217514
37	4	4.475345612	-0.475345612
38	4	3.025846958	0.974153042
39	5	4.227778435	0.772221565
40	4.5	3.874097109	0.625902891
41	4.5	3.770399094	0.729600906

42	3	4.261273861	-1.261273861
43	3	3.992155552	-0.992155552
44	5	5.257711887	-0.257711887
45	5	5.075682163	-0.075682163
46	5	5.090843678	-0.090843678
47	5	4.470458031	0.529541969
48	3	3.61349988	-0.61349988
49	6	4.956889153	1.043110847
50	5	4.498444557	0.501555443
51	5.5	4.673595905	0.826404095
52	5	4.466954231	0.533045769
53	5	5.221735477	-0.221735477
54	4.5	4.445707321	0.054292679
55	5	4.545145988	0.454854012
56	5	4.644574642	0.355425358
57	4.5	4.933734417	-0.433734417
58	5	4.54402256	0.45597744
59	4	4.70004034	-0.70004034
60	5	4.780043125	0.219956875
61	5	4.778876781	0.221123219
62	7	5.20919323	1.79080677
63	5	4.810224056	0.189775944
64	4	4.894505024	-0.894505024
65	5	5.200512409	-0.200512409
66	5	4.935984135	0.064015865
67	4.5	4.434431553	0.065568447
68	5	4.949698448	0.050301552
69	3	3.061730385	-0.061730385
70	4	5.630025864	-1.630025864
71	5	4.383594036	0.616405964
72	7.5	4.467776299	3.032223701
73	4	3.693557978	0.306442022
74	4.5	4.584660053	-0.084660053
75	8.5	3.572829485	4.927170515
76	2	4.411577225	-2.411577225
77	1	3.313678503	-2.313678503
78	2	3.014253855	-1.014253855
79	1	3.200802326	-2.200802326
80	5	4.880195618	0.119804382
81	5.5	5.099908829	0.400091171
82	6	4.950122833	1.049877167
83	5.5	5.076031685	0.423968315
84	5	4.341298103	0.658701897
85	6	4.950258732	1.049741268

86	5	4.880356312	0.119643688
87	7	5.469101906	1.530898094
88	5	4.805494785	0.194505215
89	5	4.567625046	0.432374954
90	4	5.05655098	-1.05655098
91	6	5.061890602	0.938109398
92	5.5	5.276704311	0.223295689
93	6.5	5.076957226	1.423042774
94	5.5	4.670499802	0.829500198
95	5	4.61810112	0.38189888
96	5	5.236358643	-0.236358643
97	4.5	4.917748928	-0.417748928
98	5	5.27491188	-0.27491188
99	4	3.652132273	0.347867727
100	7	5.237965107	1.762034893
101	7	4.243434429	2.756565571
102	6	4.642915249	1.357084751
103	5	4.796919823	0.203080177
104	2	2.394713402	-0.394713402
105	4	4.801609993	-0.801609993
106	6	4.741246223	1.258753777
107	6	4.934619904	1.065380096
108	5	5.49013567	-0.49013567
109	3.5	2.759728193	0.740271807
110	8	5.534020424	2.465979576
111	5	3.742187023	1.257812977
112	5	4.237840652	0.762159348
113	4	2.922842264	1.077157736
114	5	3.030380964	1.969619036
115	8	5.507766724	2.492233276
116	3	4.302959442	-1.302959442
117	7	3.932018995	3.067981005

Neural network output of Ca-SCP1-MC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.464281082	0.035718918
2	3	4.401668072	-1.401668072
3	3.5	4.931308746	-1.431308746
4	5	5.22587204	-0.22587204
5	6	4.994033813	1.005966187
6	8	6.590456963	1.409543037
7	8.5	7.076079845	1.423920155
8	5.5	5.962384224	-0.462384224
9	6	6.742831707	-0.742831707
10	4	5.455254555	-1.455254555
11	6	6.311785698	-0.311785698
12	7	5.340929031	1.659070969
13	3	4.401668072	-1.401668072
14	4	4.339142323	-0.339142323
15	4.5	3.87812233	0.62187767
16	4.5	5.920304775	-1.420304775
17	6	7.408416748	-1.408416748
18	4	4.697896481	-0.697896481
19	4	3.87812233	0.12187767
20	7	4.635026932	2.364973068
21	8	7.253638268	0.746361732
22	2	4.635026932	-2.635026932
23	6	6.769248486	-0.769248486
24	4.5	4.107466698	0.392533302
25	5.5	5.620316982	-0.120316982
26	5.5	5.22587204	0.27412796
27	5.5	4.424205303	1.075794697
28	6	6.119744301	-0.119744301
29	5.5	6.959119797	-1.459119797
30	4.5	4.931308746	-0.431308746
31	4	4.931308746	-0.931308746
32	5.5	4.994033813	0.505966187
33	8	7.300761223	0.699238777
34	7	6.83914566	0.16085434
35	5.5	6.64471674	-1.14471674
36	3	5.455254555	-2.455254555
37	7	6.698253632	0.301746368
38	5	5.558980942	-0.558980942
39	10	6.443275928	3.556724072
40	5.5	6.64471674	-1.14471674
41	6	6.235263348	-0.235263348

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42	6.5	7.076079845	-0.576079845
43	5	5.681252956	-0.681252956
44	6.5	6.698253632	-0.198253632
45	3	5.269024849	-2.269024849
46	6	5.620316982	0.379683018
47	6	6.443275928	-0.443275928
48	4	6.235263348	-2.235263348
49	4	5.577692986	-1.577692986
50	6	6.498519897	-0.498519897
51	4	4.931308746	-0.931308746
52	3	3.87812233	-0.87812233
53	7	7.670966148	-0.670966148
54	3	5.393483162	-2.393483162
55	3	5.681252956	-2.681252956

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Neural network output of Ca-SCP1-MC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.773617744	-0.273617744
2	3	4.58317852	-1.58317852
3	3.5	5.085490227	-1.585490227
4	5	5.194595814	-0.194595814
5	6	5.030376911	0.969623089
6	8	6.464046955	1.535953045
7	8.5	6.538719654	1.961280346
8	5.5	5.654652119	-0.154652119
9	6	6.447291851	-0.447291851
10	4	5.549125195	-1.549125195
11	6	5.844924927	0.155075073
12	7	5.468904018	1.531095982
13	3	4.792307377	-1.792307377
14	4	4.704149246	-0.704149246
15	4.5	4.425019741	0.074980259
16	4.5	5.775793552	-1.275793552
17	6	6.573404312	-0.573404312
18	4	4.932808399	-0.932808399
19	4	4.460197926	-0.460197926
20	7	4.686625004	2.313374996
21	8	6.806356907	1.193643093
22	2	4.696218014	-2.696218014
23	6	6.03098917	-0.03098917
24	4.5	4.976108074	-0.476108074
25	5.5	6.01082468	-0.51082468
26	5.5	5.022091866	0.477908134
27	5.5	4.993169308	0.506830692
28	6	6.053659916	-0.053659916
29	5.5	6.460316181	-0.960316181
30	4.5	5.395450115	-0.895450115
31	4	5.452426434	-1.452426434
32	5.5	5.263092995	0.236907005
33	8	6.576278687	1.423721313
34	7	6.665292263	0.334707737
35	5.5	6.514471531	-1.014471531
36	3	5.317122936	-2.317122936
37	7	6.26839304	0.73160696
38	5	6.06883049	-1.06883049
39	10	6.22621727	3.77378273
40	5.5	6.220292568	-0.720292568
41	6	6.406641483	-0.406641483

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42	6.5	6.563976288	-0.063976288
43	5	6.232317448	-1.232317448
44	6.5	5.716614246	0.783385754
45	3	5.384508133	-2.384508133
46	6	5.931331635	0.068668365
47	6	5.768014431	0.231985569
48	4	5.954479218	-1.954479218
49	4	5.613107681	-1.613107681
50	6	5.940789223	0.059210777
51	4	5.527078629	-1.527078629
52	3	4.477903843	-1.477903843
53	7	6.532481194	0.467518806
54	3	5.664883137	-2.664883137
55	3	5.778846741	-2.778846741

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Neural network output of Ca-SCP1-CC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	5.935964584	0.064035416
2	7	6.223902702	0.776097298
3	4	5.379684925	-1.379684925
4	1	4.171934128	-3.171934128
5	5	5.987324238	-0.987324238
6	3	3.929526091	-0.929526091
7	6	5.784950256	0.215049744
8	3	4.713801861	-1.713801861
9	5	6.061558723	-1.061558723
10	6.5	5.183104038	1.316895962
11	7	6.179848671	0.820151329
12	6	5.70613718	0.29386282
13	5.5	5.067548752	0.432451248
14	4.5	5.009153366	-0.509153366
15	7	6.345228672	0.654771328
16	4	5.436724186	-1.436724186
17	4	5.268569946	-1.268569946
18	6	5.464209557	0.535790443
19	8	6.622394562	1.377605438
20	6.5	5.987324238	0.512675762
21	7.5	6.2763381	1.2236619
22	6.5	6.034450531	0.465549469
23	4	5.626158237	-1.626158237
24	5	6.134487629	-1.134487629
25	4	5.183104038	-1.183104038

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Neural network output of Ca-SCP1-CC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	5.550621986	0.449378014
2	7	5.604353905	1.395646095
3	4	5.513953209	-1.513953209
4	1	5.453352451	-4.453352451
5	5	5.587263107	-0.587263107
6	3	5.42206049	-2.42206049
7	6	5.599052906	0.400947094
8	3	5.598065853	-2.598065853
9	5	5.594827652	-0.594827652
10	6.5	5.500203609	0.999796391
11	7	5.594642162	1.405357838
12	6	5.436061859	0.563938141
13	5.5	5.513371944	-0.013371944
14	4.5	5.471082687	-0.971082687
15	7	5.604401588	1.395598412
16	4	5.520974636	-1.520974636
17	4	5.492034435	-1.492034435
18	6	5.622940063	0.377059937
19	8	5.667084217	2.332915783
20	6.5	5.565607071	0.934392929
21	7.5	5.682452679	1.817547321
22	6.5	5.605175018	0.894824982
23	4	5.519219398	-1.519219398
24	5	5.614183426	-0.614183426
25	4	5.572461605	-1.572461605

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Neural network outputs of the SCP2 analysis

Neural network output of Ca-SCP2-AR-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	3.321290016	1.678709984
2	3.5	3.343508482	0.156491518
3	4	3.650762081	0.349237919
4	5.5	3.935154676	1.564845324
5	6.5	3.992750168	2.507249832
6	8.5	5.13615799	3.36384201
7	5	4.688570499	0.311429501
8	6	4.199240685	1.800759315
9	7.5	4.833525658	2.666474342
10	4.5	3.895442486	0.604557514
11	6	4.412961483	1.587038517
12	7	4.172646523	2.827353477
13	3.5	3.454605103	0.045394897
14	4.5	3.799328566	0.700671434
15	5	3.630405426	1.369594574
16	5	4.19514513	0.80485487
17	6.5	4.572299004	1.927700996
18	3.5	3.454605103	0.045394897
19	4	3.383439779	0.616560221
20	7	3.626183033	3.373816967
21	9	5.281079769	3.718920231
22	3	3.996146441	-0.996146441
23	5.5	5.019539833	0.480460167
24	3	3.430232525	-0.430232525
25	5	5.022633553	-0.022633553
26	3	3.650762081	-0.650762081
27	4.5	4.238213539	0.261786461
28	6	4.761283875	1.238716125
29	4	5.010736942	-1.010736942
30	3	4.04576683	-1.04576683
31	5	4.204527855	0.795472145
32	3	3.862568378	-0.862568378
33	8	4.982834816	3.017165184
34	6	5.060078621	0.939921379
35	6	4.942162037	1.057837963
36	4.5	4.043342113	0.456657887
37	7	4.637080669	2.362919331
38	5	4.743901253	0.256098747
39	6	4.365437508	1.634562492
40	5	4.680609703	0.319390297
41	6.5	4.510234356	1.989765644

42	7	5.114487171	1.885512829
43	5	4.696820259	0.303179741
44	5	4.370956421	0.629043579
45	4.5	5.019539833	-0.519539833
46	5	4.820974827	0.179025173
47	6	4.741305828	1.258694172
48	5	4.427621841	0.572378159
49	5	4.065945625	0.934054375
50	2	4.386000156	-2.386000156
51	4	4.131168842	-0.131168842
52	3	3.58097744	-0.58097744
53	7	4.918095112	2.081904888
54	4	4.23558712	-0.23558712
55	3	4.3441782	-1.3441782
56	6	5.021599293	0.978400707
57	7	5.174467564	1.825532436
58	4.5	4.464875698	0.035124302
59	2.5	3.566006899	-1.066006899
60	5.5	5.117863178	0.382136822
61	2	3.017516375	-1.017516375
62	7	4.302165985	2.697834015
63	3.5	4.784079552	-1.284079552
64	5.5	4.958385468	0.541614532
65	4	4.238213539	-0.238213539
66	7	5.13615799	1.86384201
67	6.5	4.478431702	2.021568298
68	5	4.863659382	0.136340618
69	3.5	4.572626114	-1.072626114
70	8	5.019539833	2.980460167
71	4.5	4.155805111	0.344194889
72	5	3.699705124	1.300294876
73	7	3.935154676	3.064845324
74	8	5.338404655	2.661595345
75	6	4.229728699	1.770271301
76	5	5.016161919	-0.016161919
77	5	4.761283875	0.238716125
78	4.5	4.534393311	-0.034393311
79	6	4.882505417	1.117494583
80	5	4.475718498	0.524281502
81	5.5	3.630405426	1.869594574
82	2.5	4.338346958	-1.838346958
83	4	4.314282417	-0.314282417
84	5	4.596345901	0.403654099
85	3.5	4.232428074	-0.732428074

86	4	4.399474144	-0.399474144
87	5	4.448898792	0.551101208
88	5	4.368355751	0.631644249
89	5	4.451793671	0.548206329
90	5.5	4.420734406	1.079265594
91	4.5	4.006233692	0.493766308
92	5	4.472771168	0.527228832
93	4.5	3.737574816	0.762425184
94	5	4.660612583	0.339387417
95	4.5	3.871006966	0.628993034
96	4	4.657433987	-0.657433987
97	3.5	4.104011536	-0.604011536
98	5	3.677535057	1.322464943
99	7.5	4.721071243	2.778928757
100	4	4.942162037	-0.942162037
101	5	3.570498943	1.429501057
102	4.5	3.970914841	0.529085159
103	2	3.400041819	-1.400041819
104	7	4.067890644	2.932109356
105	3	3.784265757	-0.784265757
106	4	3.407841921	0.592158079
107	7	4.34682703	2.65317297
108	4	4.32691288	-0.32691288
109	8.5	4.832571983	3.667428017
110	2	4.006233692	-2.006233692
111	3.5	3.628364325	-0.128364325
112	3	3.652981758	-0.652981758
113	1	3.062819719	-2.062819719
114	8	4.231098175	3.768901825
115	5	4.067890644	0.932109356
116	5.5	4.206798077	1.293201923
117	2.5	4.067890644	-1.567890644
118	4	3.367720604	0.632279396
119	5	4.741305828	0.258694172
120	4	4.22019577	-0.22019577
121	2	3.53933835	-1.53933835
122	3	3.93275857	-0.93275857
123	4	4.240629673	-0.240629673
124	4.5	4.229716778	0.270283222
125	5	4.578949928	0.421050072
126	3	4.131168842	-1.131168842
127	4.5	4.611081123	-0.111081123
128	5	4.196297169	0.803702831
129	4	4.609650612	-0.609650612

130	5.5	4.172184944	1.327815056
131	5	4.177770138	0.822229862
132	3.5	4.315653324	-0.815653324
133	5.5	4.314282417	1.185717583
134	4	4.526012897	-0.526012897
135	5.5	4.423555851	1.076444149
136	5	4.28121233	0.71878767
137	4	4.147222996	-0.147222996
138	4	4.475718498	-0.475718498
139	5.5	4.451793671	1.048206329
140	5	4.368355751	0.631644249
141	4.5	3.875738382	0.624261618
142	5	4.643157482	0.356842518
143	6	4.090756893	1.909243107
144	5	4.555377483	0.444622517
145	5	4.514182568	0.485817432
146	4	4.277772903	-0.277772903
147	4	4.534552574	-0.534552574
148	5	4.326343536	0.673656464
149	3	3.475635052	-0.475635052
150	4.5	4.58191824	-0.08191824
151	2	3.912535667	-1.912535667
152	7	4.604282379	2.395717621
153	5	4.0004282	0.9995718
154	3	4.328766823	-1.328766823
155	8.5	3.799328566	4.700671434
156	4.5	3.824135303	0.675864697
157	2	3.935154676	-1.935154676
158	4.5	3.889650583	0.610349417
159	1	3.735213041	-2.735213041
160	3	4.315653324	-1.315653324
161	5	3.53933835	1.46066165
162	4	4.448898792	-0.448898792
163	5	4.559659004	0.440340996
164	4	4.608158588	-0.608158588
165	5	4.578949928	0.421050072
166	5	4.193230152	0.806769848
167	4	4.286872864	-0.286872864
168	5	4.555377483	0.444622517
169	4	4.472771168	-0.472771168
170	4	4.514182568	-0.514182568
171	4	4.804415703	-0.804415703
172	5.5	4.329056263	1.170943737
173	5	4.697922707	0.302077293

174	4.5	4.472771168	0.027228832
175	5	4.065233707	0.934766293
176	4	4.250455379	-0.250455379
177	5.5	4.368355751	1.131644249
178	5	4.454457283	0.545542717
179	4	3.848849297	0.151150703
180	4	4.196297169	-0.196297169
181	5	3.588184357	1.411815643
182	5	4.259971619	0.740028381
183	5	4.284147739	0.715852261
184	1	3.017516375	-2.017516375
185	3	4.131168842	-1.131168842
186	3	4.302165985	-1.302165985
187	5	4.175075054	0.824924946
188	5.5	4.764481068	0.735518932
189	3	3.454605103	-0.454605103
190	4	4.578949928	-0.578949928
191	4	4.0004282	-0.0004282
192	6	4.514182568	1.485817432
193	2	3.234873295	-1.234873295
194	5	3.234873295	1.765126705
195	8	4.919514179	3.080485821
196	3	3.970914841	-0.970914841
197	1	3.605705976	-2.605705976

Neural network output of Ca-SCP2-AR-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	3.876683474	1.123316526
2	3.5	3.760709286	-0.260709286
3	4	3.9678123	0.0321877
4	5.5	4.03409481	1.46590519
5	6.5	3.82435894	2.67564106
6	8.5	4.507126808	3.992873192
7	5	4.496229649	0.503770351
8	6	4.136411667	1.863588333
9	7.5	4.672330379	2.827669621
10	4.5	4.293633461	0.206366539
11	6	4.3943367	1.6056633
12	7	4.139686108	2.860313892
13	3.5	3.799674988	-0.299674988
14	4.5	3.865029573	0.634970427
15	5	3.659567595	1.340432405
16	5	4.077286243	0.922713757
17	6.5	4.56004858	1.93995142
18	3.5	3.87443018	-0.37443018
19	4	3.630314827	0.369685173
20	7	3.75984621	3.24015379
21	9	4.719362736	4.280637264
22	3	3.819633961	-0.819633961
23	5.5	4.492673874	1.007326126
24	3	3.89063549	-0.89063549
25	5	4.4097085	0.5902915
26	3	3.933763266	-0.933763266
27	4.5	3.911054134	0.588945866
28	6	4.41014719	1.58985281
29	4	4.639895916	-0.639895916
30	3	4.117100239	-1.117100239
31	5	4.097548962	0.902451038
32	3	3.947583914	-0.947583914
33	8	4.711641312	3.288358688
34	6	4.71680975	1.28319025
35	6	4.636891842	1.363108158
36	4.5	4.012868881	0.487131119
37	7	4.492428303	2.507571697
38	5	4.453339577	0.546660423
39	6	4.552334785	1.447665215
40	5	4.550035954	0.449964046
41	6.5	4.596738338	1.903261662

42	7	4.65335083	2.34664917
43	5	4.399458885	0.600541115
44	5	4.289422035	0.710577965
45	4.5	3.951385021	0.548614979
46	5	4.32204628	0.67795372
47	6	4.20927	1.79073
48	5	4.268004894	0.731995106
49	5	4.08813858	0.91186142
50	2	4.288188934	-2.288188934
51	4	4.137106895	-0.137106895
52	3	3.549838543	-0.549838543
53	7	4.604429722	2.395570278
54	4	4.221418381	-0.221418381
55	3	4.270308495	-1.270308495
56	6	4.674385548	1.325614452
57	7	4.692965508	2.307034492
58	4.5	4.347748756	0.152251244
59	2.5	3.798424959	-1.298424959
60	5.5	4.582507133	0.917492867
61	2	3.627970457	-1.627970457
62	7	4.487101078	2.512898922
63	3.5	4.344355583	-0.844355583
64	5.5	4.666371346	0.833628654
65	4	4.245215893	-0.245215893
66	7	4.775977612	2.224022388
67	6.5	4.338568211	2.161431789
68	5	4.389532566	0.610467434
69	3.5	4.40516901	-0.90516901
70	8	4.666835308	3.333164692
71	4.5	4.3320117	0.1679883
72	5	4.256317139	0.743682861
73	7	4.295329571	2.704670429
74	8	4.83577776	3.16422224
75	6	4.403878689	1.596121311
76	5	4.526873112	0.473126888
77	5	4.679665565	0.320334435
78	4.5	4.34799099	0.15200901
79	6	4.70732832	1.29267168
80	5	4.328512192	0.671487808
81	5.5	4.203557491	1.296442509
82	2.5	4.487573147	-1.987573147
83	4	4.497833252	-0.497833252
84	5	4.398020267	0.601979733
85	3.5	4.426970005	-0.926970005

86	4	4.499021053	-0.499021053
87	5	4.438917637	0.561082363
88	5	4.51322031	0.48677969
89	5	4.400136948	0.599863052
90	5.5	4.467130661	1.032869339
91	4.5	4.50932312	-0.00932312
92	5	4.398512363	0.601487637
93	4.5	4.267726898	0.232273102
94	5	4.457604885	0.542395115
95	4.5	4.3459692	0.1540308
96	4	4.515854359	-0.515854359
97	3.5	3.948563337	-0.448563337
98	5	4.191148758	0.808851242
99	7.5	4.485352993	3.014647007
100	4	4.738297939	-0.738297939
101	5	3.976947546	1.023052454
102	4.5	4.248158455	0.251841545
103	2	4.093539238	-2.093539238
104	7	4.288310528	2.711689472
105	3	4.083687782	-1.083687782
106	4	4.093415737	-0.093415737
107	7	4.44425106	2.55574894
108	4	4.004533291	-0.004533291
109	8.5	4.561662197	3.938337803
110	2	4.20963335	-2.20963335
111	3.5	3.745630026	-0.245630026
112	3	4.054831505	-1.054831505
113	1	3.965351343	-2.965351343
114	8	4.416258812	3.583741188
115	5	4.030554295	0.969445705
116	5.5	4.317948341	1.182051659
117	2.5	4.082798004	-1.582798004
118	4	3.892411232	0.107588768
119	5	4.332148552	0.667851448
120	4	4.393195629	-0.393195629
121	2	3.800185303	-1.800185303
122	3	4.180497646	-1.180497646
123	4	4.134836674	-0.134836674
124	4.5	4.469591141	0.030408859
125	5	4.562331676	0.437668324
126	3	4.445332527	-1.445332527
127	4.5	4.365384579	0.134615421
128	5	4.394147396	0.605852604
129	4	4.458117485	-0.458117485

130	5.5	4.379634857	1.120365143
131	5	4.44140625	0.55859375
132	3.5	4.402943611	-0.902943611
133	5.5	4.4850173	1.0149827
134	4	4.385038853	-0.385038853
135	5.5	4.371397018	1.128602982
136	5	4.46268034	0.53731966
137	4	4.509841919	-0.509841919
138	4	4.357115269	-0.357115269
139	5.5	4.40980196	1.09019804
140	5	4.48256731	0.51743269
141	4.5	4.399076939	0.100923061
142	5	4.558922768	0.441077232
143	6	4.32778883	1.67221117
144	5	4.503302574	0.496697426
145	5	4.470114708	0.529885292
146	4	4.311314583	-0.311314583
147	4	4.500330925	-0.500330925
148	5	4.47878933	0.52121067
149	3	3.810942888	-0.810942888
150	4.5	4.588596344	-0.088596344
151	2	4.165231705	-2.165231705
152	7	4.432901382	2.567098618
153	5	4.25608778	0.74391222
154	3	4.391747475	-1.391747475
155	8.5	3.919684172	4.580315828
156	4.5	4.087164402	0.412835598
157	2	3.949093819	-1.949093819
158	4.5	3.903130531	0.596869469
159	1	4.113666534	-3.113666534
160	3	4.471689701	-1.471689701
161	5	4.370924473	0.629075527
162	4	4.533969879	-0.533969879
163	5	4.383038521	0.616961479
164	4	4.321953773	-0.321953773
165	5	4.508850574	0.491149426
166	5	4.389158726	0.610841274
167	4	4.525638103	-0.525638103
168	5	4.456212997	0.543787003
169	4	4.420072079	-0.420072079
170	4	4.374187946	-0.374187946
171	4	4.539958	-0.539958
172	5.5	4.519639969	0.980360031
173	5	4.475421906	0.524578094

174	4.5	4.467597961	0.032402039
175	5	4.402391434	0.597608566
176	4	4.451865673	-0.451865673
177	5.5	4.511536598	0.988463402
178	5	4.386698723	0.613301277
179	4	4.101391315	-0.101391315
180	4	4.487140179	-0.487140179
181	5	4.32268858	0.67731142
182	5	4.346656799	0.653343201
183	5	4.457356453	0.542643547
184	1	3.647927284	-2.647927284
185	3	4.233489513	-1.233489513
186	3	4.294149876	-1.294149876
187	5	4.38677454	0.61322546
188	5.5	4.628465652	0.871534348
189	3	3.865126848	-0.865126848
190	4	4.743555069	-0.743555069
191	4	4.053605556	-0.053605556
192	6	4.385575294	1.614424706
193	2	3.803445101	-1.803445101
194	5	3.788939953	1.211060047
195	8	4.660535812	3.339464188
196	3	4.266760349	-1.266760349
197	1	3.970560789	-2.970560789

Neural network output of Ca-SCP2-SC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5.5	4.238517761	1.261482239
2	2.5	4.273983955	-1.773983955
3	4	4.480284691	-0.480284691
4	5	4.472913742	0.527086258
5	3.5	4.276747227	-0.776747227
6	4	4.3519454	-0.3519454
7	5	4.481908321	0.518091679
8	5	4.436159134	0.563840866
9	5	4.418087006	0.581912994
10	5.5	4.367674351	1.132325649
11	4.5	4.313454151	0.186545849
12	5	4.343603611	0.656396389
13	4.5	4.279364109	0.220635891
14	5	4.481908321	0.518091679
15	4.5	4.272476673	0.227523327
16	4	4.501047611	-0.501047611
17	3.5	4.219478607	-0.719478607
18	5	4.158247471	0.841752529
19	7.5	4.488006115	3.011993885
20	4	4.613388062	-0.613388062
21	5	4.187272072	0.812727928
22	4.5	4.241574764	0.258425236
23	2	4.205605507	-2.205605507
24	7	4.367410183	2.632589817
25	3	4.129641533	-1.129641533
26	4	4.099364758	-0.099364758
27	7	4.330623627	2.669376373
28	4	4.362523556	-0.362523556
29	8.5	4.542758942	3.957241058
30	2	4.222308636	-2.222308636
31	3.5	4.049536228	-0.549536228
32	3	4.115957737	-1.115957737
33	1	3.894042253	-2.894042253
34	8	4.477004528	3.522995472
35	5	4.276747227	0.723252773
36	5.5	4.370416164	1.129583836
37	2.5	4.137821674	-1.637821674
38	4	4.013707161	-0.013707161
39	5	4.351425171	0.648574829
40	4	4.398042679	-0.398042679
41	2	4.206220627	-2.206220627

42	3	4.349178314	-1.349178314
43	4	4.333285809	-0.333285809
44	4.5	4.364832401	0.135167599
45	5	4.499623775	0.500376225
46	3	4.241679668	-1.241679668
47	4.5	4.327796936	0.172203064
48	5	4.335246563	0.664753437
49	4	4.394270897	-0.394270897
50	5.5	4.316788673	1.183211327
51	5	4.276747227	0.723252773
52	3.5	4.415212631	-0.915212631
53	5.5	4.458283901	1.041716099
54	4	4.477697849	-0.477697849
55	5.5	4.32516861	1.17483139
56	5	4.451324463	0.548675537
57	4	4.249592304	-0.249592304
58	4	4.436159134	-0.436159134
59	5.5	4.418087006	1.081912994
60	5	4.391547203	0.608452797
61	4.5	4.23176384	0.26823616
62	5	4.442442417	0.557557583
63	6	4.230817795	1.769182205
64	5	4.437599182	0.562400818
65	5	4.402037144	0.597962856
66	4	4.453535557	-0.453535557
67	4	4.4396348	-0.4396348
68	5	4.378211021	0.621788979
69	3	4.085589886	-1.085589886
70	4.5	4.391547203	0.108452797
71	2	4.335784435	-2.335784435
72	7	4.346667767	2.653332233
73	5	4.151508808	0.848491192
74	3	4.216763496	-1.216763496
75	8.5	4.241679668	4.258320332
76	4.5	4.214541435	0.285458565
77	2	4.306400299	-2.306400299
78	4.5	4.198117733	0.301882267
79	1	4.276747227	-3.276747227
80	3	4.459531784	-1.459531784
81	5	4.297757149	0.702242851
82	4	4.547429562	-0.547429562
83	5	4.397048473	0.602951527
84	4	4.370252609	-0.370252609
85	5	4.477697849	0.522302151

Neural network output of Ca-SCP2-CC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	5.71349287	0.28650713
2	7	5.796800137	1.203199863
3	4.5	5.556740284	-1.056740284
4	2.5	5.239964008	-2.739964008
5	5.5	5.731204033	-0.231204033
6	2	5.177359581	-3.177359581
7	7	5.674499512	1.325500488
8	3.5	5.38909626	-1.88909626
9	5.5	5.754004955	-0.254004955
10	4	5.510095119	-1.510095119
11	7	5.786825657	1.213174343
12	6.5	5.651201725	0.848798275
13	5	5.47323513	-0.47323513
14	3.5	5.454713345	-1.954713345
15	8	5.84371233	2.15628767
16	4.5	5.581914902	-1.081914902
17	5	5.534150124	-0.534150124
18	7	5.594297409	1.405702591
19	8	5.928441525	2.071558475
20	6	5.731204033	0.268795967
21	5	5.821516991	-0.821516991
22	5	5.741539955	-0.741539955
23	4.5	5.627771854	-1.127771854
24	6	5.776659966	0.223340034
25	5	5.510095119	-0.510095119

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Neural network output of Ca-SCP2-CC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	5.712975979	0.287024021
2	7	5.761324883	1.238675117
3	4.5	5.678721428	-1.178721428
4	2.5	5.628976822	-3.128976822
5	5.5	5.746278763	-0.246278763
6	2	5.600618839	-3.600618839
7	7	5.759531498	1.240468502
8	3.5	5.766597271	-2.266597271
9	5.5	5.752684593	-0.252684593
10	4	5.67000103	-1.67000103
11	7	5.752336502	1.247663498
12	6.5	5.599414825	0.900585175
13	5	5.674375534	-0.674375534
14	3.5	5.636272907	-2.136272907
15	8	5.76296854	2.23703146
16	4.5	5.68996048	-1.18996048
17	5	5.666946888	-0.666946888
18	7	5.792816639	1.207183361
19	8	5.820088387	2.179911613
20	6	5.728962898	0.271037102
21	5	5.836587906	-0.836587906
22	5	5.763689041	-0.763689041
23	4.5	5.681760311	-1.181760311
24	6	5.777042866	0.222957134
25	5	5.739675999	-0.739675999

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86	5	4.382396221	0.617603779
87	4	4.389797211	-0.389797211
88	5	4.459814548	0.540185452
89	4	4.343603611	-0.343603611
90	4	4.356949806	-0.356949806
91	4	4.472913742	-0.472913742
92	5.5	4.335755825	1.164244175
93	5	4.557600498	0.442399502
94	4.5	4.477697849	0.022302151
95	5	4.409593105	0.590406895
96	4	4.407461643	-0.407461643
97	5.5	4.436159134	1.063840866
98	5	4.238838196	0.761161804
99	4	4.233507156	-0.233507156
100	4	4.289818764	-0.289818764
101	5	4.151313782	0.848686218
102	5	4.391547203	0.608452797
103	5	4.409593105	0.590406895
104	1	3.857331753	-2.857331753
105	3	4.423178196	-1.423178196
106	3	4.404839516	-1.404839516
107	5	4.319620132	0.680379868
108	5.5	4.415264606	1.084735394
109	3	3.994204998	-0.994204998
110	4	4.521420956	-0.521420956
111	4	4.335755825	-0.335755825
112	6	4.490812778	1.509187222
113	2	3.949643373	-1.949643373
114	5	3.997008562	1.002991438
115	8	4.638717651	3.361282349
116	3	4.218546391	-1.218546391
117	1	4.079906464	-3.079906464

Neural network output of Ca-SCP2-SC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5.5	3.917281628	1.582718372
2	5	5.022014141	-0.022014141
3	5	5.021278858	-0.021278858
4	3	4.570822239	-1.570822239
5	5	4.57212162	0.42787838
6	5	4.910902023	0.089097977
7	6	4.82679224	1.17320776
8	6	5.195596695	0.804403305
9	5	4.441923141	0.558076859
10	6	4.559606075	1.440393925
11	4	5.047578812	-1.047578812
12	5	4.667279243	0.332720757
13	5	4.427899361	0.572100639
14	4	4.745349884	-0.745349884
15	5.5	4.443550587	1.056449413
16	6.5	4.885596275	1.614403725
17	3	4.01456213	-1.01456213
18	4.5	3.867930174	0.632069826
19	7	4.958799362	2.041200638
20	4	5.829636574	-1.829636574
21	5	4.667276382	0.332723618
22	4	4.09939146	-0.09939146
23	2	3.303741217	-1.303741217
24	7	4.841669559	2.158330441
25	7	4.2008214	2.7991786
26	5	3.897466183	1.102533817
27	7	4.938503265	2.061496735
28	3	2.973790169	0.026209831
29	9	5.238014698	3.761985302
30	4	3.728948832	0.271051168
31	5	3.053287029	1.946712971
32	3	3.557204008	-0.557204008
33	3	3.462746382	-0.462746382
34	6.5	4.605958462	1.894041538
35	5	3.967979193	1.032020807
36	5	4.454782486	0.545217514
37	4	4.475345612	-0.475345612
38	4	3.025846958	0.974153042
39	5	4.227778435	0.772221565
40	4.5	3.874097109	0.625902891
41	4.5	3.770399094	0.729600906

42	3	4.261273861	-1.261273861
43	3	3.992155552	-0.992155552
44	5	5.257711887	-0.257711887
45	5	5.075682163	-0.075682163
46	5	5.090843678	-0.090843678
47	5	4.470458031	0.529541969
48	3	3.61349988	-0.61349988
49	6	4.956889153	1.043110847
50	5	4.498444557	0.501555443
51	5.5	4.673595905	0.826404095
52	5	4.466954231	0.533045769
53	5	5.221735477	-0.221735477
54	4.5	4.445707321	0.054292679
55	5	4.545145988	0.454854012
56	5	4.644574642	0.355425358
57	4.5	4.933734417	-0.433734417
58	5	4.54402256	0.45597744
59	4	4.70004034	-0.70004034
60	5	4.780043125	0.219956875
61	5	4.778876781	0.221123219
62	7	5.20919323	1.79080677
63	5	4.810224056	0.189775944
64	4	4.894505024	-0.894505024
65	5	5.200512409	-0.200512409
66	5	4.935984135	0.064015865
67	4.5	4.434431553	0.065568447
68	5	4.949698448	0.050301552
69	3	3.061730385	-0.061730385
70	4	5.630025864	-1.630025864
71	5	4.383594036	0.616405964
72	7.5	4.467776299	3.032223701
73	4	3.693557978	0.306442022
74	4.5	4.584660053	-0.084660053
75	8.5	3.572829485	4.927170515
76	2	4.411577225	-2.411577225
77	1	3.313678503	-2.313678503
78	2	3.014253855	-1.014253855
79	1	3.200802326	-2.200802326
80	5	4.880195618	0.119804382
81	5.5	5.099908829	0.400091171
82	6	4.950122833	1.049877167
83	5.5	5.076031685	0.423968315
84	5	4.341298103	0.658701897
85	6	4.950258732	1.049741268

86	5	4.880356312	0.119643688
87	7	5.469101906	1.530898094
88	5	4.805494785	0.194505215
89	5	4.567625046	0.432374954
90	4	5.05655098	-1.05655098
91	6	5.061890602	0.938109398
92	5.5	5.276704311	0.223295689
93	6.5	5.076957226	1.423042774
94	5.5	4.670499802	0.829500198
95	5	4.61810112	0.38189888
96	5	5.236358643	-0.236358643
97	4.5	4.917748928	-0.417748928
98	5	5.27491188	-0.27491188
99	4	3.652132273	0.347867727
100	7	5.237965107	1.762034893
101	7	4.243434429	2.756565571
102	6	4.642915249	1.357084751
103	5	4.796919823	0.203080177
104	2	2.394713402	-0.394713402
105	4	4.801609993	-0.801609993
106	6	4.741246223	1.258753777
107	6	4.934619904	1.065380096
108	5	5.49013567	-0.49013567
109	3.5	2.759728193	0.740271807
110	8	5.534020424	2.465979576
111	5	3.742187023	1.257812977
112	5	4.237840652	0.762159348
113	4	2.922842264	1.077157736
114	5	3.030380964	1.969619036
115	8	5.507766724	2.492233276
116	3	4.302959442	-1.302959442
117	7	3.932018995	3.067981005

Neural network output of Ca-SCP2-MC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	4.293058395	0.706941605
2	3.5	4.341364384	-0.841364384
3	4	4.66576767	-0.66576767
4	5.5	4.88390398	0.61609602
5	6.5	5.303518295	1.196481705
6	8.5	9.221738815	-0.721738815
7	5	6.530391693	-1.530391693
8	6	6.02233839	-0.02233839
9	7.5	6.504724503	0.995275497
10	4.5	5.182524681	-0.682524681
11	6	6.217688084	-0.217688084
12	7	7.511956692	-0.511956692
13	3.5	4.494027615	-0.994027615
14	4.5	4.511539936	-0.011539936
15	5	4.779440403	0.220559597
16	5	5.901299953	-0.901299953
17	6.5	6.574862003	-0.074862003
18	3.5	4.494453907	-0.994453907
19	4	3.837106466	0.162893534
20	7	4.311426163	2.688573837
21	9	7.611145496	1.388854504
22	3	4.445394039	-1.445394039
23	5.5	6.081647873	-0.581647873
24	3	4.420683384	-1.420683384
25	5	5.923782825	-0.923782825
26	3	4.427091599	-1.427091599
27	4.5	4.842337132	-0.342337132
28	6	5.41597414	0.58402586
29	4	6.367607117	-2.367607117
30	3	4.989655972	-1.989655972
31	5	5.427398205	-0.427398205
32	3	3.514756918	-0.514756918
33	8	8.599168777	-0.599168777
34	6	6.743541718	-0.743541718
35	6	6.191482067	-0.191482067
36	4.5	4.933865547	-0.433865547
37	7	6.783011913	0.216988087
38	5	6.331875801	-1.331875801
39	6	5.383623123	0.616376877
40	5	6.293119907	-1.293119907
41	6.5	5.346396923	1.153603077
42	7	6.832728386	0.167271614
43	5	5.081877708	-0.081877708
44	5	7.050038815	-2.050038815
45	4.5	5.3391819	-0.8391819
46	5	5.308277607	-0.308277607
47	6	6.424276829	-0.424276829
48	5	4.83198452	0.16801548
49	5	4.842782974	0.157217026
50	2	5.653926373	-3.653926373
51	4	4.594177246	-0.594177246
52	3	3.750021458	-0.750021458
53	7	7.435573578	-0.435573578
54	4	4.797694683	-0.797694683
55	3	5.062400818	-2.062400818

Neural network output of Ca-SCP2-MC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	4.491574764	0.508425236
2	3.5	4.169234753	-0.669234753
3	4	4.123645306	-0.123645306
4	5.5	4.63032341	0.86967659
5	6.5	5.969498634	0.530501366
6	8.5	9.492678642	-0.992678642
7	5	5.663510323	-0.663510323
8	6	5.772244453	0.227755547
9	7.5	7.446295738	0.053704262
10	4.5	4.787216187	-0.287216187
11	6	5.921733856	0.078266144
12	7	7.047059059	-0.047059059
13	3.5	4.585804462	-1.085804462
14	4.5	4.190251827	0.309748173
15	5	5.938800812	-0.938800812
16	5	5.607142925	-0.607142925
17	6.5	6.715775013	-0.215775013
18	3.5	4.402433395	-0.902433395
19	4	3.976962805	0.023037195
20	7	4.05804348	2.94195652
21	9	9.192745209	-0.192745209
22	3	4.117562771	-1.117562771
23	5.5	5.795461178	-0.295461178
24	3	3.453380346	-0.453380346
25	5	5.95975399	-0.95975399
26	3	3.592434168	-0.592434168
27	4.5	4.696132183	-0.196132183
28	6	5.042081833	0.957918167
29	4	5.911933899	-1.911933899
30	3	4.590631485	-1.590631485
31	5	6.022047043	-1.022047043
32	3	3.971999645	-0.971999645
33	8	8.167107582	-0.167107582
34	6	6.897839546	-0.897839546
35	6	6.298901081	-0.298901081
36	4.5	4.375507832	0.124492168
37	7	7.639278412	-0.639278412
38	5	5.502245903	-0.502245903
39	6	5.150155544	0.849844456
40	5	6.160236835	-1.160236835
41	6.5	5.586530685	0.913469315
42	7	6.582741737	0.417258263
43	5	5.494076252	-0.494076252
44	5	5.807442665	-0.807442665
45	4.5	4.829954147	-0.329954147
46	5	5.361980438	-0.361980438
47	6	6.36964798	-0.36964798
48	5	5.041052818	-0.041052818
49	5	4.592137814	0.407862186
50	2	5.130429268	-3.130429268
51	4	3.963189602	0.036810398
52	3	4.016609669	-1.016609669
53	7	7.071434975	-0.071434975
54	4	4.342784882	-0.342784882
55	3	5.40277338	-2.40277338

Neural network output of Ca-SCP3-AR-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	3	3.81485343	-0.81485343
2	5	3.699543715	1.300456285
3	5.5	4.040014267	1.459985733
4	4.5	4.088050365	0.411949635
5	4	3.871392965	0.128607035
6	7	5.311870098	1.688129902
7	6	5.991714001	0.008285999
8	6	4.537544727	1.462455273
9	5	5.369289875	-0.369289875
10	4	4.256575108	-0.256575108
11	6.5	4.734554291	1.765445709
12	5.5	4.401826859	1.098173141
13	5	3.915664673	1.084335327
14	6	3.725972891	2.274027109
15	6	3.659484148	2.340515852
16	5	5.585894585	-0.585894585
17	7	6.186297894	0.813702106
18	3	4.140994072	-1.140994072
19	4.5	3.720898628	0.779101372
20	5	3.720898628	1.279101372
21	8	6.120841503	1.879158497
22	4	3.601592541	0.398407459
23	5	4.536879063	0.463120937
24	5	4.099514961	0.900485039
25	5	4.939558983	0.060441017
26	4	3.978849649	0.021150351
27	3	3.812706232	-0.812706232
28	3	4.741550922	-1.741550922
29	4	5.581946373	-1.581946373
30	5.5	4.298002243	1.201997757
31	6	4.442418575	1.557581425
32	7	4.122135639	2.877864361
33	5.5	5.924065113	-0.424065113
34	7	6.271979809	0.728020191
35	6.5	6.043489933	0.456510067
36	4	4.256575108	-0.256575108
37	7.5	5.375813961	2.124186039
38	6.5	5.34083128	1.15916872
39	7	5.776157856	1.223842144
40	6	5.160810471	0.839189529
41	6	6.53268528	-0.53268528

42	5.5	6.03843689	-0.53843689
43	7	5.781611443	1.218388557
44	5	4.442775249	0.557224751
45	5	3.943367243	1.056632757
46	6.5	4.635532379	1.864467621
47	6.5	4.122135639	2.377864361
48	5	5.1510005	-0.1510005
49	5.5	5.112071991	0.387928009
50	2	4.961997032	-2.961997032
51	5	4.48377037	0.51622963
52	3.5	3.637806654	-0.137806654
53	6	5.727898121	0.272101879
54	4	4.557278633	-0.557278633
55	4.5	4.799178123	-0.299178123
56	5	6.054597855	-1.054597855
57	8	6.692628384	1.307371616
58	5	4.823564053	0.176435947
59	4	3.804075003	0.195924997
60	4.5	5.876656532	-1.376656532
61	2	3.720898628	-1.720898628
62	5.5	5.392802238	0.107197762
63	3	4.666034698	-1.666034698
64	6.5	5.978699684	0.521300316
65	5	4.453053951	0.546946049
66	5.5	6.127039909	-0.627039909
67	5	3.973364115	1.026635885
68	4.5	4.442903996	0.057096004
69	6	4.449197292	1.550802708
70	9	6.149982929	2.850017071
71	5	4.821354389	0.178645611
72	6	4.692042828	1.307957172
73	8	5.065613747	2.934386253
74	9	7.348791122	1.651208878
75	6	5.626060009	0.373939991
76	7	6.304572105	0.695427895
77	5.5	5.924065113	-0.424065113
78	5	5.009606838	-0.009606838
79	7	6.348368168	0.651631832
80	6	4.635532379	1.364467621
81	5	4.323122501	0.676877499
82	4	5.190159798	-1.190159798
83	4	5.655924797	-1.655924797
84	5	4.956459045	0.043540955
85	5	5.227742672	-0.227742672

86	5.5	5.34083128	0.15916872
87	5	5.367000103	-0.367000103
88	4	4.874116421	-0.874116421
89	5	5.290803909	-0.290803909
90	5	4.829566956	0.170433044
91	4.5	5.454627991	-0.954627991
92	5	4.718342304	0.281657696
93	5.5	4.956459045	0.543540955
94	6.5	5.031598091	1.468401909
95	5	5.082491398	-0.082491398
96	6	5.160810471	0.839189529
97	3	4.177425861	-1.177425861
98	5	4.019111156	0.980888844
99	8.5	4.950672626	3.549327374
100	5.5	6.304572105	-0.804572105
101	5	4.687601566	0.312398434
102	7	4.216891289	2.783108711
103	3	4.227656364	-1.227656364
104	4	4.883871555	-0.883871555
105	6.5	3.892792702	2.607207298
106	5.5	3.925203562	1.574796438
107	8	5.233521461	2.766478539
108	4.5	3.727224588	0.772775412
109	8.5	5.466965199	3.033034801
110	3.5	4.453053951	-0.953053951
111	5	3.720898628	1.279101372
112	4	4.386463165	-0.386463165
113	5	3.937256098	1.062743902
114	8	4.889025688	3.110974312
115	5	3.973008633	1.026991367
116	5.5	4.850611687	0.649388313
117	4.5	4.401826859	0.098173141
118	5	3.701145887	1.298854113
119	5	4.323121548	0.676878452
120	4	4.694719315	-0.694719315
121	2	3.757728338	-1.757728338
122	4	4.570936203	-0.570936203
123	2	3.796394587	-1.796394587
124	5.5	5.048788548	0.451211452
125	6	5.189712048	0.810287952
126	4.5	5.298926353	-0.798926353
127	5	4.618849754	0.381150246
128	5.5	5.035065651	0.464934349
129	5	4.528206348	0.471793652

130	3.5	4.538237572	-1.038237572
131	4	5.34083128	-1.34083128
132	4.5	4.694719315	-0.194719315
133	4.5	5.427273273	-0.927273273
134	4	4.894271851	-0.894271851
135	5	4.815841675	0.184158325
136	4.5	5.107406139	-0.607406139
137	5	4.815841675	0.184158325
138	4.5	4.894271851	-0.394271851
139	4	4.463396072	-0.463396072
140	4	4.741550922	-0.741550922
141	5	5.483046055	-0.483046055
142	5	5.601831436	-0.601831436
143	5.5	4.924136639	0.575863361
144	4	5.093914509	-1.093914509
145	5.5	5.335381985	0.164618015
146	5	4.922144413	0.077855587
147	5	4.685269833	0.314730167
148	3	5.171217442	-2.171217442
149	4	3.537397861	0.462602139
150	4.5	5.626060009	-1.126060009
151	3	4.671955585	-1.671955585
152	8	5.18221283	2.81778717
153	2	4.915299416	-2.915299416
154	4.5	4.304265499	0.195734501
155	9	3.852980614	5.147019386
156	4	4.081027031	-0.081027031
157	2.5	3.935578823	-1.435578823
158	3	3.721570253	-0.721570253
159	1	4.155478954	-3.155478954
160	5	5.519970894	-0.519970894
161	6	5.325562	0.674438
162	5.5	6.043489933	-0.543489933
163	5	4.950672626	0.049327374
164	4.5	4.555024147	-0.055024147
165	4.5	5.223301411	-0.723301411
166	5	5.193733215	-0.193733215
167	5	5.064817905	-0.064817905
168	4	5.280471802	-1.280471802
169	6	4.902072906	1.097927094
170	5	4.880188465	0.119811535
171	6.5	4.850611687	1.649388313
172	5	5.043635368	-0.043635368
173	5.5	5.454627991	0.045372009

174	4.5	5.346216679	-0.846216679
175	5	4.683012009	0.316987991
176	5.5	5.454627991	0.045372009
177	4	5.214551449	-1.214551449
178	2.5	4.593417645	-2.093417645
179	1	3.93646884	-2.93646884
180	6.5	5.501419544	0.998580456
181	7	4.815841675	2.184158325
182	8	4.939558983	3.060441017
183	5.5	5.333374023	0.166625977
184	1	3.637080669	-2.637080669
185	4	4.426136494	-0.426136494
186	5	4.741550922	0.258449078
187	4	5.022048473	-1.022048473
188	5	5.932445526	-0.932445526
189	3	3.622735023	-0.622735023
190	7	6.572113037	0.427886963
191	5	3.935578823	1.064421177
192	5	4.894271851	0.105728149
193	4.5	3.699543715	0.800456285
194	3	3.701145887	-0.701145887
195	9	6.043489933	2.956510067
196	3	4.487223625	-1.487223625
197	3	3.701145887	-0.701145887

Neural network output of Ca-SCP3-AR-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	3	2.408972263	0.591027737
2	5	3.648751736	1.351248264
3	5.5	3.893423796	1.606576204
4	4.5	4.042811871	0.457188129
5	4	3.343150139	0.656849861
6	7	6.397488594	0.602511406
7	6	5.626853466	0.373146534
8	6	5.158049107	0.841950893
9	5	4.317740917	0.682259083
10	4	3.973896503	0.026103497
11	6.5	5.420863152	1.079136848
12	5.5	6.157964706	-0.657964706
13	5	3.19016695	1.80983305
14	6	3.889614105	2.110385895
15	6	3.951760769	2.048239231
16	5	4.50334692	0.49665308
17	7	6.059905529	0.940094471
18	3	4.689979076	-1.689979076
19	4.5	4.013197422	0.486802578
20	5	4.377824306	0.622175694
21	8	7.712209225	0.287790775
22	4	4.387117386	-0.387117386
23	5	5.083650589	-0.083650589
24	5	3.089476824	1.910523176
25	5	4.760396957	0.239603043
26	4	4.570244312	-0.570244312
27	3	3.282308102	-0.282308102
28	3	4.955511093	-1.955511093
29	4	5.377923965	-1.377923965
30	5.5	4.115558624	1.384441376
31	6	5.155492306	0.844507694
32	7	6.302705765	0.697294235
33	5.5	5.492996216	0.007003784
34	7	6.878097057	0.121902943
35	6.5	6.379113197	0.120886803
36	4	4.643969059	-0.643969059
37	7.5	6.033338547	1.466661453
38	6.5	5.897772789	0.602227211
39	7	5.297712803	1.702287197
40	6	4.860608578	1.139391422
41	6	7.05059576	-1.05059576

42	5.5	6.092271805	-0.592271805
43	7	8.865308762	-1.865308762
44	5	5.770199299	-0.770199299
45	5	4.751446724	0.248553276
46	6.5	7.003913403	-0.503913403
47	6.5	4.686542511	1.813457489
48	5	5.210384369	-0.210384369
49	5.5	4.572566986	0.927433014
50	2	4.317096233	-2.317096233
51	5	5.059056282	-0.059056282
52	3.5	2.913959026	0.586040974
53	6	5.222606182	0.777393818
54	4	4.234520912	-0.234520912
55	4.5	4.343842506	0.156157494
56	5	5.753542423	-0.753542423
57	8	7.50564003	0.49435997
58	5	4.302632332	0.697367668
59	4	4.368326187	-0.368326187
60	4.5	5.01598835	-0.51598835
61	2	3.425409555	-1.425409555
62	5.5	5.442577362	0.057422638
63	3	3.144622326	-0.144622326
64	6.5	6.163099766	0.336900234
65	5	4.173744202	0.826255798
66	5.5	6.144073486	-0.644073486
67	5	4.855964184	0.144035816
68	4.5	4.419892788	0.080107212
69	6	4.712516308	1.287483692
70	9	7.316061497	1.683938503
71	5	4.594480038	0.405519962
72	6	5.27502346	0.72497654
73	8	6.263721466	1.736278534
74	9	8.435612679	0.564387321
75	6	6.33655262	-0.33655262
76	7	8.062016487	-1.062016487
77	5.5	5.026726723	0.473273277
78	5	4.483241081	0.516758919
79	7	6.710769176	0.289230824
80	6	4.521503925	1.478496075
81	5	4.364799023	0.635200977
82	4	4.600482464	-0.600482464
83	4	5.172102451	-1.172102451
84	5	5.185681343	-0.185681343
85	5	4.610660553	0.389339447

86	5.5	4.543418407	0.956581593
87	5	5.125565529	-0.125565529
88	4	4.366947174	-0.366947174
89	5	5.161177635	-0.161177635
90	5	4.595143795	0.404856205
91	4.5	5.914098263	-1.414098263
92	5	4.735952854	0.264047146
93	5.5	4.440937042	1.059062958
94	6.5	5.568456173	0.931543827
95	5	4.710763931	0.289236069
96	6	5.166054249	0.833945751
97	3	3.92453599	-0.92453599
98	5	4.67694664	0.32305336
99	8.5	5.762838364	2.737161636
100	5.5	6.749717712	-1.249717712
101	5	4.201146126	0.798853874
102	7	4.744496822	2.255503178
103	3	3.473675251	-0.473675251
104	4	4.808172226	-0.808172226
105	6.5	4.940090179	1.559909821
106	5.5	4.122469902	1.377530098
107	8	4.867003441	3.132996559
108	4.5	5.393424988	-0.893424988
109	8.5	8.0906353	0.4093647
110	3.5	4.522895813	-1.022895813
111	5	4.440364838	0.559635162
112	4	4.367560863	-0.367560863
113	5	4.082349777	0.917650223
114	8	4.715153217	3.284846783
115	5	4.00761652	0.99238348
116	5.5	4.383069038	1.116930962
117	4.5	4.27726078	0.22273922
118	5	4.116919041	0.883080959
119	5	5.304513454	-0.304513454
120	4	4.615249157	-0.615249157
121	2	2.433938026	-0.433938026
122	4	4.38125658	-0.38125658
123	2	4.982047081	-2.982047081
124	5.5	4.824409485	0.675590515
125	6	5.168203831	0.831796169
126	4.5	4.361301899	0.138698101
127	5	4.448416233	0.551583767
128	5.5	4.423000336	1.076999664
129	5	4.341962337	0.658037663

130	3.5	4.464857101	-0.964857101
131	4	4.80880022	-0.80880022
132	4.5	4.909213066	-0.409213066
133	4.5	4.962009907	-0.462009907
134	4	4.669752598	-0.669752598
135	5	4.550446987	0.449553013
136	4.5	4.760869026	-0.260869026
137	5	4.453427315	0.546572685
138	4.5	4.714885235	-0.214885235
139	4	4.363442421	-0.363442421
140	4	4.460866451	-0.460866451
141	5	4.822751522	0.177248478
142	5	5.430745602	-0.430745602
143	5.5	4.707532406	0.792467594
144	4	4.88284111	-0.88284111
145	5.5	4.621973515	0.878026485
146	5	5.761818886	-0.761818886
147	5	4.707924366	0.292075634
148	3	4.967991829	-1.967991829
149	4	3.067247152	0.932752848
150	4.5	4.704160213	-0.204160213
151	3	4.116308689	-1.116308689
152	8	5.12122345	2.87877655
153	2	4.155851364	-2.155851364
154	4.5	4.415020943	0.084979057
155	9	6.080271721	2.919728279
156	4	4.982090473	-0.982090473
157	2.5	2.605751514	-0.105751514
158	3	3.313406944	-0.313406944
159	1	3.457891226	-2.457891226
160	5	4.978632927	0.021367073
161	6	4.269350052	1.730649948
162	5.5	5.546138763	-0.046138763
163	5	4.993078709	0.006921291
164	4.5	4.905632973	-0.405632973
165	4.5	5.237102032	-0.737102032
166	5	4.796435833	0.203564167
167	5	4.780758381	0.219241619
168	4	5.3173666	-1.3173666
169	6	4.726514816	1.273485184
170	5	4.916108131	0.083891869
171	6.5	4.972427845	1.527572155
172	5	4.482156277	0.517843723
173	5.5	5.508740902	-0.008740902

174	4.5	4.611562252	-0.111562252
175	5	4.616611958	0.383388042
176	5.5	4.970313549	0.529686451
177	4	4.811536312	-0.811536312
178	2.5	4.637277603	-2.137277603
179	1	2.336385489	-1.336385489
180	6.5	5.363250256	1.136749744
181	7	5.487773895	1.512226105
182	8	4.827795029	3.172204971
183	5.5	4.91915226	0.58084774
184	1	3.268201351	-2.268201351
185	4	4.54745245	-0.54745245
186	5	4.71242094	0.28757906
187	4	5.181856155	-1.181856155
188	5	5.086976051	-0.086976051
189	3	2.12297821	0.87702179
190	7	5.807072163	1.192927837
191	5	3.034526825	1.965473175
192	5	4.659682751	0.340317249
193	4.5	3.407237053	1.092762947
194	3	2.466796398	0.533203602
195	9	6.808396816	2.191603184
196	3	4.335789204	-1.335789204
197	3	4.331441402	-1.331441402

Neural network output of Ca-SCP3-SC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	4.156024933	0.843975067
2	4	5.167985916	-1.167985916
3	4	4.952153206	-0.952153206
4	5	4.869663239	0.130336761
5	5	5.167985916	-0.167985916
6	5.5	5.098738194	0.401261806
7	5	4.879868984	0.120131016
8	4	5.098738194	-1.098738194
9	5	4.869663239	0.130336761
10	5	4.79119873	0.20880127
11	4.5	5.098738194	-0.598738194
12	5	4.79119873	0.20880127
13	5.5	4.41789484	1.08210516
14	6.5	5.013465405	1.486534595
15	5	4.811790943	0.188209057
16	6	5.098738194	0.901261806
17	3	4.41789484	-1.41789484
18	5	4.478997231	0.521002769
19	8.5	5.088860989	3.411139011
20	5.5	5.507008553	-0.007008553
21	5	4.433907509	0.566092491
22	7	4.478997231	2.521002769
23	3	4.082349777	-1.082349777
24	4	4.80152607	-0.80152607
25	6.5	4.489682674	2.010317326
26	5.5	4.177843094	1.322156906
27	8	5.023478985	2.976521015
28	4.5	4.291436195	0.208563805
29	8.5	5.083895206	3.416104794
30	3.5	4.79119873	-1.29119873
31	5	3.826970339	1.173029661
32	4	4.323997021	-0.323997021
33	5	3.667304277	1.332695723
34	8	4.711767197	3.288232803
35	5	4.641970158	0.358029842
36	5.5	4.722206593	0.777793407
37	4.5	4.641970158	-0.141970158
38	5	3.99742794	1.00257206
39	5	4.780816078	0.219183922
40	4	4.631426811	-0.631426811
41	2	3.667304277	-1.667304277

42	4	4.166944981	-0.166944981
43	2	4.302308083	-2.302308083
44	5.5	5.028459072	0.471540928
45	6	5.163109779	0.836890221
46	4.5	4.957182884	-0.457182884
47	5	5.083895206	-0.083895206
48	5.5	4.641970158	0.858029842
49	5	5.088860989	-0.088860989
50	3.5	4.489682674	-0.989682674
51	4	5.098738194	-1.098738194
52	4.5	4.631426811	-0.131426811
53	4.5	5.028459072	-0.528459072
54	4	4.864536762	-0.864536762
55	5	5.088860989	-0.088860989
56	4.5	4.80152607	-0.30152607
57	5	5.018481255	-0.018481255
58	4.5	4.936962128	-0.436962128
59	4	4.79119873	-0.79119873
60	4	4.947106838	-0.947106838
61	5	5.098738194	-0.098738194
62	5	5.4387784	-0.4387784
63	5.5	4.869663239	0.630336761
64	4	4.947106838	-0.947106838
65	5.5	5.172842503	0.327157497
66	5	4.571472645	0.428527355
67	5	4.869663239	0.130336761
68	3	4.947106838	-1.947106838
69	4	3.656323195	0.343676805
70	4.5	5.507008553	-1.007008553
71	3	4.65246439	-1.65246439
72	8	5.216760635	2.783239365
73	2	4.323997021	-2.323997021
74	4.5	4.936962128	-0.436962128
75	9	3.667304277	5.332695723
76	4	4.166944981	-0.166944981
77	2.5	3.986442089	-1.486442089
78	3	3.826970339	-0.826970339
79	1	3.837976217	-2.837976217
80	5	5.245758057	-0.245758057
81	6	4.673279285	1.326720715
82	5.5	4.957182884	0.542817116
83	5	5.158213139	-0.158213139
84	4.5	4.706528664	-0.206528664
85	4.5	5.088860989	-0.588860989

86	5	4.811790943	0.188209057
87	5	5.308025837	-0.308025837
88	4	5.023478985	-1.023478985
89	6	4.869663239	1.130336761
90	5	5.098738194	-0.098738194
91	6.5	5.153297901	1.346702099
92	5	5.308025837	-0.308025837
93	5.5	5.098738194	0.401261806
94	4.5	4.869663239	-0.369663239
95	5	4.489682674	0.510317326
96	5.5	5.028459072	0.471540928
97	4	5.098738194	-1.098738194
98	2.5	5.236174583	-2.736174583
99	1	4.156024933	-3.156024933
100	6.5	5.255250931	1.244749069
101	7	4.65246439	2.34753561
102	8	4.957182884	3.042817116
103	5.5	5.098738194	0.401261806
104	1	3.508089542	-2.508089542
105	4	4.478997231	-0.478997231
106	5	4.80152607	0.19847393
107	4	4.80152607	-0.80152607
108	5	5.507008553	-0.507008553
109	3	3.826970339	-0.826970339
110	7	5.37863636	1.62136364
111	5	3.986442089	1.013557911
112	5	4.79119873	0.20880127
113	4.5	3.837976217	0.662023783
114	3	3.837976217	-0.837976217
115	9	5.236174583	3.763825417
116	3	4.722206593	-1.722206593
117	3	3.99742794	-0.99742794

Neural network output of Ca-SCP3-SC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	4.328832626	0.671167374
2	4	5.329625607	-1.329625607
3	4	5.307975769	-1.307975769
4	5	4.970715046	0.029284954
5	5	4.872251987	0.127748013
6	5.5	5.046033382	0.453966618
7	5	5.240664482	-0.240664482
8	4	4.980110168	-0.980110168
9	5	4.697273731	0.302726269
10	5	4.946176052	0.053823948
11	4.5	5.170548439	-0.670548439
12	5	4.926225185	0.073774815
13	5.5	4.729602337	0.770397663
14	6.5	5.009590626	1.490409374
15	5	4.698011875	0.301988125
16	6	5.170447826	0.829552174
17	3	3.761240959	-0.761240959
18	5	3.996541739	1.003458261
19	8.5	5.076414108	3.423585892
20	5.5	5.867573261	-0.367573261
21	5	4.56306839	0.43693161
22	7	4.522056103	2.477943897
23	3	3.886403561	-0.886403561
24	4	4.841125965	-0.841125965
25	6.5	3.966646671	2.533353329
26	5.5	3.830610514	1.669389486
27	8	5.168522358	2.831477642
28	4.5	4.146341324	0.353658676
29	8.5	5.482074261	3.017925739
30	3.5	4.215174198	-0.715174198
31	5	3.437301159	1.562698841
32	4	4.199183941	-0.199183941
33	5	3.563229799	1.436770201
34	8	4.824305534	3.175694466
35	5	3.87583518	1.12416482
36	5.5	4.648494244	0.851505756
37	4.5	4.573099136	-0.073099136
38	5	3.23510766	1.76489234
39	5	4.705509663	0.294490337
40	4	4.891911983	-0.891911983
41	2	3.642163515	-1.642163515

42	4	4.574167252	-0.574167252
43	2	4.129445076	-2.129445076
44	5.5	5.031158447	0.468841553
45	6	5.102806091	0.897193909
46	4.5	5.183236122	-0.683236122
47	5	4.62672472	0.37327528
48	5.5	4.791236877	0.708763123
49	5	5.040421009	-0.040421009
50	3.5	4.778286934	-1.278286934
51	4	5.117500782	-1.117500782
52	4.5	4.906980991	-0.406980991
53	4.5	5.179430008	-0.679430008
54	4	4.860957623	-0.860957623
55	5	4.721354008	0.278645992
56	4.5	4.992391586	-0.492391586
57	5	4.887850285	0.112149715
58	4.5	4.998405933	-0.498405933
59	4	4.798052311	-0.798052311
60	4	5.080847263	-1.080847263
61	5	4.943109989	0.056890011
62	5	5.244701862	-0.244701862
63	5.5	4.822061062	0.677938938
64	4	5.264206886	-1.264206886
65	5.5	5.298259735	0.201740265
66	5	4.825160503	0.174839497
67	5	4.840237617	0.159762383
68	3	5.16459322	-2.16459322
69	4	3.153486967	0.846513033
70	4.5	5.551700115	-1.051700115
71	3	4.418226719	-1.418226719
72	8	5.224045277	2.775954723
73	2	4.576372623	-2.576372623
74	4.5	4.695077896	-0.195077896
75	9	3.847058773	5.152941227
76	4	4.196965218	-0.196965218
77	2.5	4.206229687	-1.706229687
78	3	3.558134317	-0.558134317
79	1	3.762354374	-2.762354374
80	5	4.650914192	0.349085808
81	6	4.670958042	1.329041958
82	5.5	5.445854664	0.054145336
83	5	4.860761642	0.139238358
84	4.5	4.910570145	-0.410570145
85	4.5	5.179276943	-0.679276943

86	5	4.790659428	0.209340572
87	5	4.925002098	0.074997902
88	4	5.003987789	-1.003987789
89	6	4.984265327	1.015734673
90	5	5.01412487	-0.01412487
91	6.5	5.307106495	1.192893505
92	5	4.839503288	0.160496712
93	5.5	5.289427757	0.210572243
94	4.5	5.046753883	-0.546753883
95	5	4.772870064	0.227129936
96	5.5	5.113760948	0.386239052
97	4	4.96394968	-0.96394968
98	2.5	5.072290897	-2.572290897
99	1	3.671313763	-2.671313763
100	6.5	5.168349743	1.331650257
101	7	4.555456161	2.444543839
102	8	5.122549534	2.877450466
103	5.5	5.134168625	0.365831375
104	1	2.611963749	-1.611963749
105	4	4.661714077	-0.661714077
106	5	4.805136681	0.194863319
107	4	4.860991001	-0.860991001
108	5	5.618516922	-0.618516922
109	3	3.025059462	-0.025059462
110	7	5.7147789	1.2852211
111	5	3.942656517	1.057343483
112	5	4.685135841	0.314864159
113	4.5	3.050779581	1.449220419
114	3	3.010075092	-0.010075092
115	9	5.631507874	3.368492126
116	3	4.42184639	-1.42184639
117	3	3.762219906	-0.762219906

Neural network output of Ca-SCP3-MC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	3	5.169679642	-2.169679642
2	5	4.678852081	0.321147919
3	5.5	5.12833643	0.37166357
4	4.5	5.069547653	-0.569547653
5	4	5.055580139	-1.055580139
6	7	7.456942558	-0.456942558
7	6	6.349377155	-0.349377155
8	6	5.753267288	0.246732712
9	5	5.555145741	-0.555145741
10	4	4.732582092	-0.732582092
11	6.5	5.57516861	0.92483139
12	5.5	5.557366848	-0.057366848
13	5	5.152535915	-0.152535915
14	6	5.35677433	0.64322567
15	6	4.818558216	1.181441784
16	5	6.556116581	-1.556116581
17	7	7.037482262	-0.037482262
18	3	5.351644993	-2.351644993
19	4.5	5.121603489	-0.621603489
20	5	4.807114124	0.192885876
21	8	6.834561825	1.165438175
22	4	4.744282722	-0.744282722
23	5	5.558862209	-0.558862209
24	5	5.30785656	-0.30785656
25	5	5.15463686	-0.15463686
26	4	4.631206036	-0.631206036
27	3	5.507087231	-2.507087231
28	3	5.34860754	-2.34860754
29	4	5.765348911	-1.765348911
30	5.5	5.590360165	-0.090360165
31	6	6.161810875	-0.161810875
32	7	5.976561069	1.023438931
33	5.5	5.90405798	-0.40405798
34	7	7.060392857	-0.060392857
35	6.5	6.810961246	-0.310961246
36	4	5.536175251	-1.536175251
37	7.5	5.948648453	1.551351547
38	6.5	6.501117706	-0.001117706
39	7	6.313911438	0.686088562
40	6	5.57041502	0.42958498
41	6	7.2213521	-1.2213521
42	5.5	6.291018963	-0.791018963
43	7	6.834561825	0.165438175
44	5	5.105004787	-0.105004787
45	5	5.536175251	-0.536175251
46	6.5	6.444657326	0.055342674
47	6.5	5.386374474	1.113625526
48	5	5.948648453	-0.948648453
49	5.5	5.712132454	-0.212132454
50	2	6.053985596	-4.053985596
51	5	5.71130991	-0.71130991
52	3.5	4.775494576	-1.275494576
53	6	6.563185692	-0.563185692
54	4	6.201059818	-2.201059818
55	4.5	6.088547707	-1.588547707

Neural network output of Ca-SCP3-MC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	3	4.801446438	-1.801446438
2	5	4.458590508	0.541409492
3	5.5	5.084562778	0.415437222
4	4.5	4.94229269	-0.44229269
5	4	5.031860828	-1.031860828
6	7	7.028741837	-0.028741837
7	6	6.471922874	-0.471922874
8	6	5.662673473	0.337326527
9	5	6.05767107	-1.05767107
10	4	5.085643291	-1.085643291
11	6.5	5.459332943	1.040667057
12	5.5	5.540979385	-0.040979385
13	5	4.906471252	0.093528748
14	6	4.858219147	1.141780853
15	6	4.60884285	1.39115715
16	5	5.832116127	-0.832116127
17	7	6.594049454	0.405950546
18	3	5.018727303	-2.018727303
19	4.5	4.725746632	-0.225746632
20	5	4.531447887	0.468552113
21	8	6.852762222	1.147237778
22	4	4.557111263	-0.557111263
23	5	5.649094582	-0.649094582
24	5	5.114989281	-0.114989281
25	5	5.637613297	-0.637613297
26	4	4.646736145	-0.646736145
27	3	5.340496063	-2.340496063
28	3	5.774681568	-2.774681568
29	4	6.053649426	-2.053649426
30	5.5	5.455468178	0.044531822
31	6	5.575733185	0.424266815
32	7	5.584438801	1.415561199
33	5.5	6.109226227	-0.609226227
34	7	6.839438915	0.160561085
35	6.5	6.562421799	-0.062421799
36	4	5.411777496	-1.411777496
37	7.5	6.284277439	1.215722561
38	6.5	6.398846149	0.101153851
39	7	6.21668911	0.78331089
40	6	5.912778378	0.087221622
41	6	6.608784676	-0.608784676
42	5.5	6.380013943	-0.880013943
43	7	6.478112698	0.521887302
44	5	5.194410324	-0.194410324
45	5	5.70709753	-0.70709753
46	6.5	6.108580112	0.391419888
47	6.5	5.71627903	0.78372097
48	5	5.790477753	-0.790477753
49	5.5	5.323859215	0.176140785
50	2	5.792524338	-3.792524338
51	5	5.656672001	-0.656672001
52	3.5	4.499864578	-0.999864578
53	6	6.253128052	-0.253128052
54	4	5.907909393	-1.907909393
55	4.5	5.876730919	-1.376730919

[illegible]

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	5.733769894	-0.733769894
2	8	6.042209625	1.957790375
3	5	5.702223301	-0.702223301
4	4	4.709185123	-0.709185123
5	4.5	6.316431999	-1.816431999
6	2	4.67982769	-2.67982769
7	5.5	6.017012596	-0.517012596
8	3	5.151432514	-2.151432514
9	6.5	6.263014317	0.236985683
10	5	5.568341732	-0.568341732
11	5.5	6.030770779	-0.530770779
12	5	5.670891285	-0.670891285
13	4.5	5.553237915	-1.053237915
14	6	5.297353745	0.702646255
15	9	6.503873825	2.496126175
16	5	5.636946678	-0.636946678
17	6	5.410057545	0.589942455
18	8	6.008711815	1.991288185
19	9	6.756093979	2.243906021
20	6	6.200129986	-0.200129986
21	7	6.579986095	0.420013905
22	5.5	6.014787197	-0.514787197
23	5	5.960962772	-0.960962772
24	7	5.964780331	1.035219669
25	6	5.570474148	0.429525852

Neural network output of [illegible]

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	5.519373417	-0.519373417
2	8	6.198174	1.801826
3	5	5.531716824	-0.531716824
4	4	3.322005749	0.677994251
5	4.5	6.357288837	-1.857288837
6	2	3.137819767	-1.137819767
7	5.5	6.288928986	-0.788928986
8	3	5.079883099	-2.079883099
9	6.5	6.444246769	0.055753231
10	5	4.835865498	0.164134502
11	5.5	6.179928303	-0.679928303
12	5	4.718912601	0.281087399
13	4.5	5.334686756	-0.834686756
14	6	4.959083557	1.040916443
15	9	6.708417416	2.291582584
16	5	5.19475174	-0.19475174
17	6	4.907470226	1.092529774
18	8	6.111553669	1.888446331
19	9	7.301620007	1.698379993
20	6	6.031924248	-0.031924248
21	7	6.927867889	0.072132111
22	5.5	6.274784088	-0.774784088
23	5	5.553359985	-0.553359985
24	7	6.100313663	0.899686337
25	6	5.348135948	0.651864052

Neural network outputs of the SCP4 analysis

Neural network output of Ca-SCP4-AR-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	2	2.488104343	-0.488104343
2	3	2.15960741	0.84039259
3	4	3.143908501	0.856091499
4	4	3.632353306	0.367646694
5	3	4.118792057	-1.118792057
6	9	6.984706879	2.015293121
7	9	5.74878931	3.25121069
8	6	4.500607967	1.499392033
9	8.5	7.048196793	1.451803207
10	5	5.359220028	-0.359220028
11	7	5.207282066	1.792717934
12	4.5	5.557957172	-1.057957172
13	3	2.683953524	0.316046476
14	4	2.46758604	1.53241396
15	2	3.15807724	-1.15807724
16	2	4.563107967	-2.563107967
17	9	4.834342003	4.165657997
18	3	2.683953524	0.316046476
19	2	1.92607224	0.07392776
20	4	2.235422611	1.764577389
21	10	7.262577057	2.737422943
22	4	3.140810251	0.859189749
23	8	6.629525661	1.370474339
24	3	2.835280418	0.164719582
25	7	6.787238598	0.212761402
26	4	3.231189728	0.768810272
27	5	4.085457802	0.914542198
28	8	6.262061596	1.737938404
29	9	7.113912582	1.886087418
30	4	4.74930191	-0.74930191
31	4	5.799556255	-1.799556255
32	3	3.381513119	-0.381513119
33	9	6.854436398	2.145563602
34	9	7.648539543	1.351460457
35	8	7.105352402	0.894647598
36	5	3.546093702	1.453906298
37	7	6.210813999	0.789186001
38	8	6.194466591	1.805533409
39	7	5.556892395	1.443107605
40	8	6.262061596	1.737938404
41	6	5.91496706	0.08503294
42	9	6.877275467	2.122724533
43	6	6.166265488	-0.166265488
44	7	5.080974579	1.919025421
45	8	5.639582634	2.360417366
46	7	6.09991169	0.90008831
47	7	5.871323109	1.128676891
48	6	4.614834309	1.385165691
49	3	4.312118053	-1.312118053
50	6	4.529005051	1.470994949
51	4	5.265957355	-1.265957355
52	2	1.973590255	0.026409745
53	10	5.621686935	4.378313065
54	6	4.333589554	1.666410446
55	6	4.700042725	1.299957275
56	9	6.648736	2.351264
57	10	6.960356712	3.039643288
58	7.5	5.836023808	1.663976192
59	3	3.029385328	-0.029385328
60	8	7.084946156	0.915053844
61	1	1.854302168	-0.854302168
62	6	5.428450108	0.571549892
63	8	6.455603123	1.544396877
64	8	6.657582283	1.342417717
65	5	5.183261871	-0.183261871
66	9	7.207570076	1.792429924
67	5	5.720127106	-0.720127106
68	8	6.383704662	1.616295338
69	7	6.409743786	0.590256214
70	8	7.105352402	0.894647598
71	4	5.613817692	-1.613817692
72	4	4.929923534	-0.929923534
73	4	5.156398296	-1.156398296
74	10	7.507909775	2.492090225
75	8	4.123702526	3.876297474
76	9	5.541676044	3.458323956
77	8	6.477600098	1.522399902
78	6	5.533521175	0.466478825
79	9	6.704837799	2.295162201
80	6	5.948732376	0.051267624
81	2	4.68157053	-2.68157053
82	6	6.192888737	-0.192888737
83	6	5.742810249	0.257189751
84	7	5.526332378	1.473667622
85	5	5.594216824	-0.594216824
86	5.5	5.771096706	-0.271096706
87	7	5.175984383	1.824015617
88	6	5.933374405	0.066625595
89	6	5.469659328	0.530340672
90	6.5	5.933374405	0.566625595
91	5	5.956369877	-0.956369877
92	7	5.856661797	1.143338203
93	4	4.093692303	-0.093692303
94	7	6.327543259	0.672456741
95	5	4.112119675	0.887880325
96	8	5.541676521	2.458323479
97	5	2.806135178	2.193864822
98	3	4.834342003	-1.834342003
99	8	6.255384922	1.744615078
100	8	7.195770741	0.804229259
101	4	2.683442354	1.316557646
102	4.5	5.134749889	-0.634749889
103	2.5	3.483277559	-0.983277559
104	5	5.141571045	-0.141571045
105	5	4.03103447	0.96896553
106	2	2.745864868	-0.745864868
107	5	5.848015785	-0.848015785
108	3	5.207282066	-2.207282066
109	7	7.094339848	-0.094339848
110	5	4.850152969	0.149847031
111	3	3.015316248	-0.015316248
112	3	3.98277688	-0.98277688
113	2	3.517830849	-1.517830849
114	5.5	6.151842594	-0.651842594
115	5	3.955093384	1.044906616
116	5.5	4.960500717	0.539499283
117	5	4.730553627	0.269446373
118	3	3.015316248	-0.015316248
119	7	6.0160532	0.9839468
120	7	5.526332378	1.473667622
121	4	3.086788177	0.913211823
122	5	4.093692303	0.906307697
123	4	5.933374405	-1.933374405
124	6	5.742810249	0.257189751
125	7	6.420695305	0.579304695
126	4	5.547626019	-1.547626019
127	6	6.0507617	-0.0507617
128	7	4.607368469	2.392631531
129	6.5	6.363134384	0.136865616
130	7	4.8997612	2.1002388
131	5	5.397255421	-0.397255421
132	5.5	5.971280098	-0.471280098
133	6	5.664797783	0.335202217
134	7	5.822060108	1.177939892
135	5.5	5.864414215	-0.364414215
136	7	5.257761002	1.742238998
137	5	6.265663147	-1.265663147
138	6	5.986986637	0.013013363
139	6	5.833404064	0.166595936
140	6	5.80970335	0.19029665
141	3	5.732202053	-2.732202053
142	7	6.670900345	0.329099655
143	3	5.833404064	-2.833404064
144	7	5.909925461	1.090074539
145	7	5.755705833	1.244294167
146	6	4.924904823	1.075095177
147	8	5.605669975	2.394330025
148	6	6.106519222	-0.106519222
149	2	3.506933928	-1.506933928
150	6	6.9096632	-0.9096632
151	3	3.798869371	-0.798869371
152	4	7.078801632	-3.078801632
153	5	4.486838818	0.513161182
154	7	6.413068295	0.586931705
155	4	3.292523623	0.707476377
156	4	4.314507008	-0.314507008
157	4	3.884223461	0.115776539
158	5	3.076326132	1.923673868
159	5	2.914675713	2.085324287
160	5.5	5.151386261	0.348613739
161	4	3.508366585	0.491633415
162	7	5.257761002	1.742238998
163	5.5	6.543822289	-1.043822289
164	7	5.922282219	1.077717781
165	7	6.349671364	0.650328636
166	6	4.597001076	1.402998924
167	5	6.442499638	-1.442499638
168	7	5.526332378	1.473667622
169	7	5.693021297	1.306978703
170	7	5.629823685	1.370176315
171	7	6.973411083	0.026588917
172	5	6.327543259	-1.327543259
173	8	5.629823685	2.370176315

174	7	6.008881092	0.991118908
175	6	4.924904823	1.075095177
176	5	5.664797783	-0.664797783
177	6	5.605669975	0.394330025
178	5	6.136930466	-1.136930466
179	4	4.290660381	-0.290660381
180	7	5.009717941	1.990282059
181	4	4.290660381	-0.290660381
182	6	4.514038086	1.485961914
183	6	5.397255421	0.602744579
184	1	1.578328133	-0.578328133
185	4	5.675061703	-1.675061703
186	6	4.960500717	1.039499283
187	6	5.38820219	0.61179781
188	7	6.9096632	0.0903368
189	3	2.970795631	0.029204369
190	7	6.691168785	0.308831215
191	5	4.511800289	0.488199711
192	7	5.526332378	1.473667622
193	2	2.350667477	-0.350667477
194	2	2.350667477	-0.350667477
195	8	6.691168785	1.308831215
196	4.5	4.876588345	-0.376588345
197	2	4.008132458	-2.008132458

Neural network output of Ca-SCP4-AR-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	2	2.329360485	-0.329360485
2	3	3.967605829	-0.967605829
3	4	4.660852432	-0.660852432
4	4	4.615161419	-0.615161419
5	3	4.616951466	-1.616951466
6	9	8.579371452	0.420628548
7	9	8.804923534	0.195076466
8	6	5.246086121	0.753913879
9	8.5	7.874646187	0.625353813
10	5	4.655293465	0.344706535
11	7	9.896929741	-2.896929741
12	4.5	5.456876278	-0.956876278
13	3	4.489160538	-1.489160538
14	4	4.223106861	-0.223106861
15	2	3.313777447	-1.313777447
16	2	2.465226173	-0.465226173
17	9	8.893649101	0.106350899
18	3	4.585238457	-1.585238457
19	2	4.648387432	-2.648387432
20	4	3.861584902	0.138415098
21	10	9.31573391	0.68426609
22	4	4.100912094	-0.100912094
23	8	8.153902531	-0.153902531
24	3	4.049757004	-1.049757004
25	7	5.023276329	1.976723671
26	4	4.497732162	-0.497732162
27	5	5.145868301	-0.145868301
28	8	5.552003384	2.447996616
29	9	8.1337924	0.8662076
30	4	5.456968784	-1.456968784
31	4	5.631089687	-1.631089687
32	3	4.100451469	-1.100451469
33	9	8.566944599	0.433055401
34	9	7.881279469	1.118720531
35	8	7.637458324	0.362541676
36	5	5.178966045	-0.178966045
37	7	6.421062946	0.578937054
38	8	6.27687788	1.72312212
39	7	6.379367828	0.620632172
40	8	7.752322674	0.247677326
41	6	6.316992283	-0.316992283

42	9	8.018166065	0.981833935
43	6	6.567749023	-0.567749023
44	7	6.963712692	0.036287308
45	8	7.715932369	0.284067631
46	7	5.887620449	1.112379551
47	7	7.728320122	-0.728320122
48	6	5.432368755	0.567631245
49	3	4.952997684	-1.952997684
50	6	5.244026661	0.755973339
51	4	5.115374565	-1.115374565
52	2	4.059049606	-2.059049606
53	10	8.97615242	1.02384758
54	6	5.64586544	0.35413456
55	6	5.775204182	0.224795818
56	9	7.626089573	1.373910427
57	10	8.627042294	1.372957706
58	7.5	4.843493462	2.656506538
59	3	4.574891567	-1.574891567
60	8	7.733854771	0.266145229
61	1	2.951357603	-1.951357603
62	6	6.259697437	-0.259697437
63	8	6.16117239	1.83882761
64	8	6.433905602	1.566094398
65	5	5.624804974	-0.624804974
66	9	8.289372444	0.710627556
67	5	3.676509857	1.323490143
68	8	7.811020851	0.188979149
69	7	7.133015156	-0.133015156
70	8	6.526623249	1.473376751
71	4	5.650923252	-1.650923252
72	4	4.908976078	-0.908976078
73	4	5.35052824	-1.35052824
74	10	8.697814465	1.302185535
75	8	7.132069588	0.867930412
76	9	8.689215183	0.310784817
77	8	6.484510422	1.515489578
78	6	7.557957649	-1.557957649
79	9	8.449860096	0.550139904
80	6	5.858806133	0.141193867
81	2	4.961288452	-2.961288452
82	6	6.476975918	-0.476975918
83	6	6.237617493	-0.237617493
84	7	5.903934956	1.096065044
85	5	5.918220043	-0.918220043

86	5.5	6.037264824	-0.537264824
87	7	6.180941582	0.819058418
88	6	6.059157372	-0.059157372
89	6	5.711173058	0.288826942
90	6.5	6.125759125	0.374240875
91	5	6.218644619	-1.218644619
92	7	6.125669479	0.874330521
93	4	5.234479427	-1.234479427
94	7	6.277083874	0.722916126
95	5	5.440400124	-0.440400124
96	8	5.970770359	2.029229641
97	5	4.862761021	0.137238979
98	3	5.283582687	-2.283582687
99	8	6.076000214	1.923999786
100	8	6.773476601	1.226523399
101	4	6.752809525	-2.752809525
102	4.5	5.874427319	-1.374427319
103	2.5	3.926029205	-1.426029205
104	5	6.064295292	-1.064295292
105	5	5.347568989	-0.347568989
106	2	2.919985294	-0.919985294
107	5	6.260540962	-1.260540962
108	3	4.305344105	-1.305344105
109	7	6.77183342	0.22816658
110	5	5.379214764	-0.379214764
111	3	3.899765491	-0.899765491
112	3	4.195999622	-1.195999622
113	2	4.456410885	-2.456410885
114	5.5	5.14977026	0.35022974
115	5	4.66348362	0.33651638
116	5.5	5.83324194	-0.33324194
117	5	5.321102142	-0.321102142
118	3	4.631363869	-1.631363869
119	7	6.897473335	0.102526665
120	7	6.896674633	0.103325367
121	4	4.817281246	-0.817281246
122	5	5.793899059	-0.793899059
123	4	4.912213326	-0.912213326
124	6	6.367350101	-0.367350101
125	7	6.30927372	0.69072628
126	4	5.03150177	-1.03150177
127	6	5.661562443	0.338437557
128	7	6.427640915	0.572359085
129	6.5	6.057017803	0.442982197

130	7	7.072031975	-0.072031975
131	5	6.011824131	-1.011824131
132	5.5	6.150415421	-0.650415421
133	6	6.254056454	-0.254056454
134	7	6.993757725	0.006242275
135	5.5	5.947341442	-0.447341442
136	7	7.017940998	-0.017940998
137	5	5.217858791	-0.217858791
138	6	5.946644306	0.053355694
139	6	5.874258518	0.125741482
140	6	6.046937943	-0.046937943
141	3	4.465653896	-1.465653896
142	7	6.33966732	0.66033268
143	3	4.114925861	-1.114925861
144	7	6.258206367	0.741793633
145	7	6.143045902	0.856954098
146	6	6.272431374	-0.272431374
147	8	7.920110226	0.079889774
148	6	6.381011486	-0.381011486
149	2	2.853432655	-0.853432655
150	6	6.518023968	-0.518023968
151	3	3.255613804	-0.255613804
152	4	4.304696083	-0.304696083
153	5	4.619112492	0.380887508
154	7	7.905896664	-0.905896664
155	4	4.428763866	-0.428763866
156	4	5.023873806	-1.023873806
157	4	4.213873386	-0.213873386
158	5	5.150232792	-0.150232792
159	5	3.183134556	1.816865444
160	5.5	5.48026228	0.01973772
161	4	4.956140995	-0.956140995
162	7	7.148925781	-0.148925781
163	5.5	5.165224075	0.334775925
164	7	7.025052547	-0.025052547
165	7	7.290182114	-0.290182114
166	6	6.82098341	-0.82098341
167	5	5.290654659	-0.290654659
168	7	7.017260551	-0.017260551
169	7	7.085013866	-0.085013866
170	7	7.130770206	-0.130770206
171	7	7.295049667	-0.295049667
172	5	5.236763	-0.236763
173	8	7.099528313	0.900471687

174	7	6.192700863	0.807299137
175	6	5.899285793	0.100714207
176	5	5.248065472	-0.248065472
177	6	5.995157719	0.004842281
178	5	5.328946114	-0.328946114
179	4	5.14930439	-1.14930439
180	7	6.103969097	0.896030903
181	4	5.185345173	-1.185345173
182	6	5.533980846	0.466019154
183	6	5.973358154	0.026641846
184	1	2.346706629	-1.346706629
185	4	5.343857765	-1.343857765
186	6	5.944374084	0.055625916
187	6	6.234769821	-0.234769821
188	7	6.63206768	0.36793232
189	3	4.644745827	-1.644745827
190	7	6.630834103	0.369165897
191	5	5.745554447	-0.745554447
192	7	5.866823673	1.133176327
193	2	2.441495895	-0.441495895
194	2	2.259683609	-0.259683609
195	8	7.560185432	0.439814568
196	4.5	5.652994156	-1.152994156
197	2	3.460845947	-1.460845947

Neural network output of Ca-SCP4-SC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	4.881914616	0.118085384
2	6	6.049001694	-0.049001694
3	6	6.049001694	-0.049001694
4	6	5.885736942	0.114263058
5	7	5.200054169	1.799945831
6	6	5.729009628	0.270990372
7	6	6.085855007	-0.085855007
8	6.5	6.049001694	0.450998306
9	5.5	5.747867107	-0.247867107
10	6	6.166490078	-0.166490078
11	5	5.911092758	-0.911092758
12	6.5	6.282650948	0.217349052
13	5.5	5.366095543	0.133904457
14	5.5	6.085855007	-0.585855007
15	4.5	5.200054169	-0.700054169
16	6	6.021696568	-0.021696568
17	4.5	4.7919631	-0.2919631
18	7	4.920544147	2.079455853
19	8	6.317889214	1.682110786
20	5	6.697998047	-1.697998047
21	8.5	5.162168026	3.337831974
22	5.5	5.487415791	0.012584209
23	3	4.600137711	-1.600137711
24	7.5	5.810758114	1.689241886
25	6	5.404618263	0.595381737
26	6.5	4.093462467	2.406537533
27	7.5	5.608454227	1.891545773
28	5	4.32141304	0.67858696
29	9.5	6.57010746	2.92989254
30	4	4.995569706	-0.995569706
31	5.5	4.518829823	0.981170177
32	5	4.718774796	0.281225204
33	3.5	5.286015987	-1.786015987
34	9.5	6.2269907	3.2730093
35	5	4.7919631	0.2080369
36	6	5.525664806	0.474335194
37	5	5.506676674	-0.506676674
38	5	4.518829823	0.481170177
39	5	5.683046341	-0.683046341
40	6	5.885736942	0.114263058
41	7	5.366095543	1.633904457

42	4	5.608454227	-1.608454227
43	6	5.569420338	0.430579662
44	5	6.049001694	-1.049001694
45	5	6.184713364	-1.184713364
46	5	5.569420338	-0.569420338
47	6	5.442111492	0.557888508
48	6	5.478574276	0.521425724
49	6.5	5.967899799	0.532100201
50	7.5	6.282650948	1.217349052
51	6	5.200054169	0.799945831
52	5	5.930363178	-0.930363178
53	8	6.049001694	1.950998306
54	6	5.986165524	0.013834476
55	7	5.321125984	1.678874016
56	7	6.085855007	0.914144993
57	7	5.810758114	1.189241886
58	5	5.646330357	-0.646330357
59	6	5.949298859	0.050701141
60	6	5.84888792	0.15111208
61	5	5.123393536	-0.123393536
62	4	6.085855007	-2.085855007
63	6	5.224983692	0.775016308
64	6.5	6.184713364	0.315286636
65	6.5	6.184713364	0.315286636
66	7.5	6.14790535	1.35209465
67	6.5	6.121317863	0.378682137
68	4	6.14790535	-2.14790535
69	4.5	4.581611633	-0.081611633
70	7	6.049001694	0.950998306
71	4	4.32141304	-0.32141304
72	8.5	5.162168026	3.337831974
73	5	5.506676674	-0.506676674
74	5	6.475426674	-1.475426674
75	9	5.162168026	3.837831974
76	3	5.569420338	-2.569420338
77	2.5	4.554661751	-2.054661751
78	6	4.893607616	1.106392384
79	2	5.200054169	-3.200054169
80	6.5	5.321125984	1.178874016
81	5	5.366095543	-0.366095543
82	6	6.085855007	-0.085855007
83	6	5.930363178	0.069636822
84	5.5	6.085855007	-0.585855007
85	6.5	6.184713364	0.315286636

86	6	5.84888792	0.15111208
87	6	5.810758114	0.189241886
88	7	5.885736942	1.114263058
89	7.5	6.085855007	1.414144993
90	6	5.986165524	0.013834476
91	6	6.282650948	-0.282650948
92	7	5.608454227	1.391545773
93	6	6.220077991	-0.220077991
94	6	6.282650948	-0.282650948
95	6.5	6.14790535	0.35209465
96	6.5	5.810758114	0.689241886
97	5.5	5.646330357	-0.146330357
98	5.5	5.404618263	0.095381737
99	5	5.162168026	-0.162168026
100	8.5	6.085855007	2.414144993
101	6	5.162168026	0.837831974
102	6	5.031945229	0.968054771
103	6	5.442111492	0.557888508
104	3	3.688600779	-0.688600779
105	6	5.771352768	0.228647232
106	6.5	5.646330357	0.853669643
107	6.5	6.049001694	0.450998306
108	8	6.282650948	1.717349052
109	6	4.32141304	1.67858696
110	8	6.475426674	1.524573326
111	7	5.608454227	1.391545773
112	8	5.885736942	2.114263058
113	3	4.093462467	-1.093462467
114	7	4.093462467	2.906537533
115	9	6.697998047	2.302001953
116	4	5.283386707	-1.283386707
117	6	4.881914616	1.118085384

Neural network output of Ca-SCP4-SC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5	4.200195789	0.799804211
2	6	6.116859436	-0.116859436
3	6	5.910745621	0.089254379
4	6	5.853145123	0.146854877
5	7	5.82469368	1.17530632
6	6	6.213494778	-0.213494778
7	6	6.11964798	-0.11964798
8	6.5	6.353060722	0.146939278
9	5.5	5.910958767	-0.410958767
10	6	5.80470705	0.19529295
11	5	5.339220047	-0.339220047
12	6.5	5.757874012	0.742125988
13	5.5	4.97481823	0.52518177
14	5.5	6.045719147	-0.545719147
15	4.5	5.353477478	-0.853477478
16	6	6.003597736	-0.003597736
17	4.5	5.092432976	-0.592432976
18	7	4.83076334	2.16923666
19	8	6.454772472	1.545227528
20	5	6.494926929	-1.494926929
21	8.5	7.077336788	1.422663212
22	5.5	4.964180946	0.535819054
23	3	4.241347313	-1.241347313
24	7.5	6.307730675	1.192269325
25	6	4.985853195	1.014146805
26	6.5	5.762878418	0.737121582
27	7.5	5.722827911	1.777172089
28	5	4.823225021	0.176774979
29	9.5	7.140414238	2.359585762
30	4	4.978141308	-0.978141308
31	5.5	5.01766777	0.48233223
32	5	4.501819611	0.498180389
33	3.5	3.486933231	0.013066769
34	9.5	7.635632038	1.864367962
35	5	4.746405602	0.253594398
36	6	5.224290848	0.775709152
37	5	6.089345932	-1.089345932
38	5	4.173507214	0.826492786
39	5	5.545084	-0.545084
40	6	5.096722603	0.903277397
41	7	7.002831936	-0.002831936

42	4	4.840117931	-0.840117931
43	6	6.487887859	-0.487887859
44	5	5.479138851	-0.479138851
45	5	5.758367062	-0.758367062
46	5	5.876824856	-0.876824856
47	6	5.928080082	0.071919918
48	6	5.321301937	0.678698063
49	6.5	6.173138618	0.326861382
50	7.5	5.623722553	1.876277447
51	6	5.606987	0.393013
52	5	5.20160532	-0.20160532
53	8	6.027808666	1.972191334
54	6	5.778914452	0.221085548
55	7	5.541257381	1.458742619
56	7	5.728373528	1.271626472
57	7	5.828091145	1.171908855
58	5	4.998124599	0.001875401
59	6	5.852823257	0.147176743
60	6	5.952536106	0.047463894
61	5	5.267450809	-0.267450809
62	4	6.026135921	-2.026135921
63	6	5.22792387	0.77207613
64	6.5	6.023812771	0.476187229
65	6.5	6.695438862	-0.195438862
66	7.5	6.795302391	0.704697609
67	6.5	5.890704632	0.609295368
68	4	5.690238953	-1.690238953
69	4.5	4.343680382	0.156319618
70	7	6.075080872	0.924919128
71	4	4.478848934	-0.478848934
72	8.5	5.611961842	2.888038158
73	5	4.946193695	0.053806305
74	5	6.342589378	-1.342589378
75	9	6.054432392	2.945567608
76	3	6.009494781	-3.009494781
77	2.5	3.912931681	-1.412931681
78	6	4.28549242	1.71450758
79	2	4.94686079	-2.94686079
80	6.5	6.087568283	0.412431717
81	5	5.006548405	-0.006548405
82	6	6.203160763	-0.203160763
83	6	6.622014523	-0.622014523
84	5.5	5.45600605	0.04399395
85	6.5	5.829824924	0.670175076

86	6	6.250414848	-0.250414848
87	6	5.725352764	0.274647236
88	7	5.775660515	1.224339485
89	7.5	5.948324203	1.551675797
90	6	6.416548729	-0.416548729
91	6	5.942444801	0.057555199
92	7	6.011196613	0.988803387
93	6	6.320301056	-0.320301056
94	6	5.96545887	0.03454113
95	6.5	5.457099915	1.042900085
96	6.5	5.93386507	0.56613493
97	5.5	5.82339716	-0.32339716
98	5.5	6.09837389	-0.59837389
99	5	4.534500599	0.465499401
100	8.5	6.257371426	2.242628574
101	6	5.17663908	0.82336092
102	6	4.94277668	1.05722332
103	6	5.303988934	0.696011066
104	3	3.742608547	-0.742608547
105	6	5.891200542	0.108799458
106	6.5	5.709132195	0.790867805
107	6.5	5.287733555	1.212266445
108	8	6.62308979	1.37691021
109	6	4.302240849	1.697759151
110	8	6.234594345	1.765405655
111	7	5.562702179	1.437297821
112	8	6.544224739	1.455775261
113	3	4.07165575	-1.07165575
114	7	3.835992813	3.164007187
115	9	6.815719128	2.184280872
116	4	5.357357502	-1.357357502
117	6	5.01033783	0.98966217

Neural network output of Ca-SCP4-MC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	3	4.843324661	-1.843324661
2	4.5	4.843324661	-0.343324661
3	4	5.708823204	-1.708823204
4	4	5.491205692	-1.491205692
5	5	5.484311104	-0.484311104
6	8	7.307295799	0.692704201
7	7.5	7.307816029	0.192183971
8	6	6.384130478	-0.384130478
9	7	6.864737988	0.135262012
10	4	6.095880032	-2.095880032
11	5.5	6.578455448	-1.078455448
12	8	6.444816113	1.555183887
13	4.5	5.700275898	-1.200275898
14	5	5.28374958	-0.28374958
15	6	5.287168026	0.712831974
16	6	6.75996685	-0.75996685
17	5	7.398074627	-2.398074627
18	3	6.079842567	-3.079842567
19	6	5.280798435	0.719201565
20	4.5	5.277100086	-0.777100086
21	8.5	6.628952503	1.871047497
22	4	4.423919201	-0.423919201
23	5	5.262077808	-0.262077808
24	5	6.062343597	-1.062343597
25	6	6.062343597	-0.062343597
26	4	5.280798435	-1.280798435
27	3	5.28374958	-2.28374958
28	2	6.002466679	-4.002466679
29	6	6.759489059	-0.759489059
30	7	6.043522358	0.956477642
31	8	6.75996685	1.24003315
32	8	5.2727108	2.7272892
33	6	6.958898067	-0.958898067
34	5.599999905	7.018696785	-1.41869688
35	7	6.801616192	0.198383808
36	3	6.079842567	-3.079842567
37	8	6.062343597	1.937656403
38	8	6.927027225	1.072972775
39	8.5	6.370909214	2.129090786
40	5.5	6.397017002	-0.897017002
41	5	6.921321869	-1.921321869

42	7	6.594153881	0.405846119
43	7.5	6.55841589	0.94158411
44	4	5.66764307	-1.66764307
45	5	5.980501175	-0.980501175
46	5	6.315086365	-1.315086365
47	5	5.2727108	-0.2727108
48	4.5	5.980501175	-1.480501175
49	5	6.973053455	-1.973053455
50	5	6.662645817	-1.662645817
51	4.5	5.626675129	-1.126675129
52	3	4.863348484	-1.863348484
53	5.5	6.55841589	-1.05841589
54	4.5	6.062343597	-1.562343597
55	5	5.679581165	-0.679581165

Neural network output of Ca-SCP4-MC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	3	4.929166794	-1.929166794
2	4.5	4.564277649	-0.064277649
3	4	5.591201305	-1.591201305
4	4	5.249625206	-1.249625206
5	5	5.759150028	-0.759150028
6	8	8.192468643	-0.192468643
7	7.5	7.232344151	0.267655849
8	6	6.306148052	-0.306148052
9	7	6.890551567	0.109448433
10	4	5.843067646	-1.843067646
11	5.5	5.962369919	-0.462369919
12	8	6.761953831	1.238046169
13	4.5	5.436964989	-0.936964989
14	5	4.830434799	0.169565201
15	6	5.49682188	0.50317812
16	6	6.722304321	-0.722304821
17	5	7.092587471	-2.092587471
18	3	5.634226322	-2.634226322
19	6	5.023612499	0.976387501
20	4.5	4.401329041	0.098670959
21	8.5	7.445465426	1.054531574
22	4	4.371197701	-0.371197701
23	5	5.433848381	-0.433848381
24	5	5.611367226	-0.611367226
25	6	6.501496315	-0.501496315
26	4	4.904632568	-0.904632568
27	3	5.810241699	-2.810241699
28	2	6.062864304	-4.062864304
29	6	6.536683083	-0.536683083
30	7	6.062192917	0.937807083
31	8	6.445889473	1.554110527
32	8	5.791454315	2.208545685
33	6	6.788526058	-0.788526058
34	5.5	7.515337944	-1.915338039
35	7	7.141430378	-0.141430378
36	3	6.042441368	-3.042441368
37	8	6.851457596	1.148542404
38	8	7.456847191	0.543152809
39	8.5	6.544419765	1.955580235
40	5.5	6.407969952	-0.907969952
41	5	7.274104595	-2.274104595

42	7	6.807105064	0.192894936
43	7.5	7.120580196	0.379419804
44	4	5.376525879	-1.376525879
45	5	6.342371464	-1.342371464
46	5	6.6035676	-1.6035676
47	5	5.994636059	-0.994636059
48	4.5	5.92793417	-1.42793417
49	5	6.171479702	-1.171479702
50	5	6.346206188	-1.346206188
51	4.5	6.012540817	-1.512540817
52	3	4.524118423	-1.524118423
53	5.5	6.226133823	-0.726133823
54	4.5	6.228896141	-1.728896141
55	5	6.108973503	-1.108973503

Neural network output of Ca-SCP4-CC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	5.639801502	-1.139801502
2	5.5	4.948858261	0.551141739
3	2	4.880293369	-2.880293369
4	3	3.194853306	-0.194853306
5	3	5.924983978	-2.924983978
6	3	3.077159882	-0.077159882
7	6	6.646051884	-0.646051884
8	4.5	4.996899605	-0.496899605
9	7	6.823843479	0.176156521
10	4	5.214157581	-1.214157581
11	4	6.338440418	-2.338440418
12	5	5.196330547	-0.196330547
13	5	5.258576393	-0.258576393
14	6	4.901535034	1.098464966
15	6.5	6.732214928	-0.232214928
16	5.5	5.173639774	0.326360226
17	4	4.77318716	-0.77318716
18	5	6.349871635	-1.349871635
19	7.5	7.219009399	0.280990601
20	7.5	5.796394825	1.703605175
21	8.5	7.030557632	1.469442368
22	6	6.584896088	-0.584896088
23	5.5	5.31626749	0.18373251
24	6	5.946862221	0.053137779
25	6	5.471812725	0.528187275

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Neural network output of Ca-SCP4-CC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	5.298017979	-0.798017979
2	5.5	5.837565422	-0.337565422
3	2	5.115665913	-3.115665913
4	3	3.695935488	-0.695935488
5	3	6.064277649	-3.064277649
6	3	3.514869452	-0.514869452
7	6	6.161038876	-0.161038876
8	4.5	5.263629913	-0.763629913
9	7	6.286403179	0.713596821
10	4	4.896383762	-0.896383762
11	4	6.052452087	-2.052452087
12	5	5.021503925	-0.021503925
13	5	5.37235117	-0.37235117
14	6	4.718130589	1.281869411
15	6.5	6.465947151	0.034052849
16	5.5	5.196667671	0.303332329
17	4	4.485198498	-0.485198498
18	5	5.892011166	-0.892011166
19	7.5	6.912434578	0.587565422
20	7.5	5.680021286	1.819978714
21	8.5	6.821319103	1.678680897
22	6	6.060144901	-0.060144901
23	5.5	5.49241066	0.00758934
24	6	5.79440403	0.20559597
25	6	5.348950863	0.651049137

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Neural network output of Ca-SCP5-AR-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	3.883317232	0.116682768
2	3	3.608486176	-0.608486176
3	7	4.356617928	2.643382072
4	4	4.534963608	-0.534963608
5	5	4.380910397	0.619089603
6	9	5.802152157	3.197847843
7	5	5.673326492	-0.673326492
8	6.5	4.285657883	2.214342117
9	8	5.841859341	2.158140659
10	5.5	5.036540031	0.463459969
11	5	4.344974041	0.655025959
12	4	4.088341236	-0.088341236
13	4	3.848726988	0.151273012
14	8	4.516973972	3.483026028
15	6	4.123886108	1.876113892
16	5	5.391525745	-0.391525745
17	4	5.556392193	-1.556392193
18	3.5	3.96872139	-0.46872139
19	3	4.475488663	-1.475488663
20	5	4.123886108	0.876113892
21	5	6.435512543	-1.435512543
22	3	4.626627922	-1.626627922
23	3	5.343964577	-2.343964577
24	3.5	4.628357887	-1.128357887
25	4.5	5.561865807	-1.061865807
26	2.5	4.391717434	-1.891717434
27	6	4.516973972	1.483026028
28	6	5.485108852	0.514891148
29	6	5.813514233	0.186485767
30	8	5.011895657	2.988104343
31	4.5	4.521395683	-0.021395683
32	9	5.486248016	3.513751984
33	7	5.344861984	1.655138016
34	5	6.150869846	-1.150869846
35	6.5	6.093269348	0.406730652
36	5.5	4.711647511	0.788352489
37	8	5.929596424	2.070403576
38	9	5.05238533	3.94761467
39	5.5	5.552746773	-0.052746773
40	3	5.412762165	-2.412762165
41	5	6.372673035	-1.372673035

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42	7.5	6.033353329	1.466646671
43	7	6.316821098	0.683178902
44	4	3.947610378	0.052389622
45	5.5	5.132087231	0.367912769
46	6	5.667525291	0.332474709
47	6	5.159789085	0.840210915
48	5	5.238694191	-0.238694191
49	8	5.579809666	2.420190334
50	6	5.367114067	0.632885933
51	5.5	5.376525879	0.123474121
52	4	4.242489815	-0.242489815
53	5	5.036843777	-0.036843777
54	3	5.19907093	-2.19907093
55	5	4.937942982	0.062057018
56	4	5.541027069	-1.541027069
57	6	5.275250435	0.724749565
58	3	4.894987106	-1.894987106
59	2	3.573892355	-1.573892355
60	4.5	6.002081871	-1.502081871
61	4.5	3.8838346	0.6161654
62	7.5	5.608128548	1.891871452
63	4	5.344861984	-1.344861984
64	7	6.330274582	0.669725418
65	3	5.485108852	-2.485108852
66	5	5.834802151	-0.834802151
67	7	3.958670855	3.041329145
68	7	5.19907093	1.80092907
69	4	4.628357887	-0.628357887
70	6.5	6.159629345	0.340370655
71	5	5.270048141	-0.270048141
72	4	4.660646439	-0.660646439
73	5.5	5.657186985	-0.157186985
74	7.5	6.505153656	0.994846344
75	8	5.960450649	2.039549351
76	9	5.601754665	3.398245335
77	6	5.797283173	0.202716827
78	6	5.629757404	0.370242596
79	3.5	5.590459347	-2.090459347
80	5	5.12481451	-0.12481451
81	6	4.971049786	1.028950214
82	5	5.393010616	-0.393010616
83	5	5.519546986	-0.519546986
84	6	5.454812527	0.545187473
85	4	4.901219368	-0.901219368

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86	6	5.61084938	0.38915062
87	5	5.558475494	-0.558475494
88	4	5.19280529	-1.19280529
89	4	5.594177246	-1.594177246
90	5	5.519546986	-0.519546986
91	5	4.984442711	0.015557289
92	6	5.519546986	0.480453014
93	5.5	5.140110016	0.359889984
94	5.5	5.505530834	-0.005530834
95	4	4.592983723	-0.592983723
96	4.5	5.237712383	-0.737712383
97	2	4.828250408	-2.828250408
98	5	4.194642067	0.805357933
99	7	5.361544609	1.638455391
100	5.5	6.093269348	-0.593269348
101	2	4.821483135	-2.821483135
102	5	4.8181777	0.1818223
103	2.5	4.159412384	-1.659412384
104	5.5	5.118574619	0.381425381
105	2	4.074320316	-2.074320316
106	6	4.003258705	1.996741295
107	7	5.61084938	1.38915062
108	5	4.71104908	0.28895092
109	8	6.235096455	1.764903545
110	2	4.123970032	-2.123970032
111	3	4.279120445	-1.279120445
112	4	4.592983723	-0.592983723
113	6.5	4.501383781	1.998616219
114	6	5.335474491	0.664525509
115	2	4.003258705	-2.003258705
116	7	5.12481451	1.87518549
117	5	5.010531425	-0.010531425
118	5.5	3.566370964	1.933629036
119	6	5.34910965	0.65089035
120	4	4.550821781	-0.550821781
121	6	4.54554987	1.45445013
122	4	5.270048141	-1.270048141
123	5.5	5.265852451	0.234147549
124	6	5.17446804	0.82553196
125	6	5.286985397	0.713014603
126	4.5	5.797283173	-1.297283173
127	5	5.165014744	-0.165014744
128	3	4.673555374	-1.673555374
129	6	5.288293839	0.711706161

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130	5.5	5.229874611	0.270125389
131	5	4.957989216	0.042010784
132	5.5	5.412762165	0.087237835
133	6	5.412762165	0.587237835
134	6	5.197731972	0.802268028
135	6.5	4.977298737	1.522701263
136	6.5	5.084216118	1.415783882
137	5	5.043239594	-0.043239594
138	5	5.12481451	-0.12481451
139	5	5.360019684	-0.360019684
140	5	5.159024715	-0.159024715
141	4.5	5.008349419	-0.508349419
142	5	5.287762642	-0.287762642
143	4	5.539069653	-1.539069653
144	6.5	5.627399921	0.872600079
145	5	5.539069653	-0.539069653
146	4	5.7469244	-1.7469244
147	6	4.974234581	1.025765419
148	7	5.499908924	1.500091076
149	5	4.292965412	0.707034588
150	6	5.519546986	0.480453014
151	4	4.635509014	-0.635509014
152	9	5.61342001	3.38657999
153	5	5.536753178	-0.536753178
154	6	4.888302803	1.111697197
155	7	5.086413383	1.913586617
156	5	5.19280529	-0.19280529
157	3.5	4.44055891	-0.94055891
158	5	4.30011034	0.69988966
159	3	4.670152664	-1.670152664
160	5.5	4.862678051	0.637321949
161	4	4.779956341	-0.779956341
162	4	5.662641525	-1.662641525
163	5	5.591492653	-0.591492653
164	5.5	5.558475494	-0.058475494
165	6	5.395956039	0.604043961
166	6	5.415688038	0.584311962
167	5	5.005391598	-0.005391598
168	5	5.418471813	-0.418471813
169	6	5.432729721	0.567270279
170	5	5.289976597	-0.289976597
171	5.5	5.679186344	-0.179186344
172	5	5.065458775	-0.065458775
173	4.5	5.524905682	-1.024905682

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174	5	5.57209444	-0.57209444
175	5	5.19148922	-0.19148922
176	5	5.555684566	-0.555684566
177	5	5.068582535	-0.068582535
178	3	5.19907093	-2.19907093
179	4	4.646400452	-0.646400452
180	8	5.008349419	2.991650581
181	5	4.354955673	0.645044327
182	5	4.559099674	0.440900326
183	5.5	4.786443233	0.713556767
184	2	3.454446554	-1.454446554
185	5	5.517700672	-0.517700672
186	5.5	5.105918884	0.394081116
187	5	5.339160442	-0.339160442
188	6	5.896537304	0.103462696
189	5	3.608486176	1.391513824
190	7	5.858889103	1.141110897
191	4	4.951515675	-0.951515675
192	8	5.217774868	2.782225132
193	3	3.608486176	-0.608486176
194	2	3.608486176	-1.608486176
195	7	6.252599239	0.747400761
196	4.5	4.725224495	-0.225224495
197	4.5	4.815098763	-0.315098763

Neural network output of Ca-SCPS-AR-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	4.20275116	-0.20275116
2	3	3.771971941	-0.771971941
3	7	4.318815708	2.681184292
4	4	4.515898228	-0.515898228
5	5	4.295009613	0.704990387
6	9	5.860796452	3.139203548
7	5	5.478452682	-0.478452682
8	6.5	4.522909641	1.977090359
9	8	5.860816956	2.139183044
10	5.5	4.909369946	0.590630054
11	5	4.823698044	0.176301956
12	4	4.374090672	-0.374090672
13	4	3.898709774	0.101290226
14	8	4.291454792	3.708545208
15	6	3.732161999	2.267838001
16	5	4.986691475	0.013308525
17	4	5.628269672	-1.628269672
18	3.5	3.899403811	-0.399403811
19	3	3.867673874	-0.867673874
20	5	3.970874548	1.029125452
21	5	6.347896099	-1.347896099
22	3	4.283184052	-1.283184052
23	3	5.702528	-2.702528
24	3.5	4.381186008	-0.881186008
25	4.5	5.568983078	-1.068983078
26	2.5	4.102318287	-1.602318287
27	6	4.490510941	1.509489059
28	6	5.574934006	0.425065994
29	6	5.887657166	0.112342834
30	8	4.918720722	3.081279278
31	4.5	4.555276871	-0.055276871
32	9	5.028688431	3.971311569
33	7	5.698071957	1.301928043
34	5	6.242365837	-1.242365837
35	6.5	6.089894772	0.410105228
36	5.5	4.427102566	1.072897434
37	8	5.904933453	2.095066547
38	9	5.269206047	3.730793953
39	5.5	5.67919445	-0.17919445
40	3	5.597737312	-2.597737312
41	5	6.134404659	-1.134404659

42	7.5	6.062660694	1.437339306
43	7	6.018100262	0.981899738
44	4	4.417437553	-0.417437553
45	5.5	4.681268215	0.818731785
46	6	5.617005825	0.382994175
47	6	5.224337101	0.775662899
48	5	5.282970428	-0.282970428
49	8	4.702073574	3.297926426
50	6	5.099096775	0.900903225
51	5.5	5.214406013	0.285593987
52	4	3.903279543	0.096720457
53	5	5.45442152	-0.45442152
54	3	5.267653465	-2.267653465
55	5	5.263054848	-0.263054848
56	4	5.53190136	-1.53190136
57	6	5.631113529	0.368886471
58	3	5.098278522	-2.098278522
59	2	3.721976042	-1.721976042
60	4.5	5.862470627	-1.362470627
61	4.5	3.630708456	0.869291544
62	7.5	5.71606636	1.78393364
63	4	5.509507179	-1.509507179
64	7	6.159638882	0.840361118
65	3	5.205156326	-2.205156326
66	5	6.027702808	-1.027702808
67	7	4.667624474	2.332375526
68	7	5.359237194	1.640762806
69	4	4.885313988	-0.885313988
70	6.5	6.218971252	0.281028748
71	5	5.246912956	-0.246912956
72	4	4.727776527	-0.727776527
73	5.5	5.553879261	-0.053879261
74	7.5	6.505639076	0.994360924
75	8	5.707734585	2.292265415
76	9	5.812737942	3.187262058
77	6	5.908856869	0.091143131
78	6	5.422319889	0.577680111
79	3.5	5.820822239	-2.320822239
80	5	5.251600266	-0.251600266
81	6	5.093053341	0.906946659
82	5	5.446406364	-0.446406364
83	5	5.672900677	-0.672900677
84	6	5.513690948	0.486309052
85	4	5.284871578	-1.284871578

86	6	5.592472553	0.407527447
87	5	5.492331505	-0.492331505
88	4	5.518326759	-1.518326759
89	4	5.5453372	-1.5453372
90	5	5.567053318	-0.567053318
91	5	5.355968952	-0.355968952
92	6	5.504001617	0.495998383
93	5.5	5.187736988	0.312263012
94	5.5	5.721952438	-0.221952438
95	4	5.011542797	-1.011542797
96	4.5	5.59565115	-1.09565115
97	2	4.480909348	-2.480909348
98	5	4.685492516	0.314507484
99	7	5.710062981	1.289937019
100	5.5	6.247828007	-0.747828007
101	2	4.463564873	-2.463564873
102	5	4.96461153	0.03538847
103	2.5	4.526166439	-2.026166439
104	5.5	5.109885216	0.390114784
105	2	4.404471874	-2.404471874
106	6	4.449957371	1.550042629
107	7	5.589778423	1.410221577
108	5	4.502625465	0.497374535
109	8	6.16585207	1.83414793
110	2	4.66263485	-2.66263485
111	3	4.029026985	-1.029026985
112	4	4.549226284	-0.549226284
113	6.5	4.336977005	2.163022995
114	6	5.531951427	0.468048573
115	2	4.43370533	-2.43370533
116	7	5.315876484	1.684123516
117	5	4.800816059	0.199183941
118	5.5	3.942367077	1.557632923
119	6	5.486519337	0.513480663
120	4	5.192860126	-1.192860126
121	6	4.503551483	1.496448517
122	4	5.251390934	-1.251390934
123	5.5	5.221452236	0.278547764
124	6	5.573564529	0.426435471
125	6	5.732514381	0.267485619
126	4.5	5.580102921	-1.080102921
127	5	5.369926929	-0.369926929
128	3	5.171588421	-2.171588421
129	6	5.536642551	0.463357449

130	5.5	5.394994736	0.105005264
131	5	5.318733692	-0.318733692
132	5.5	5.545006275	-0.045006275
133	6	5.611245155	0.388754845
134	6	5.43524456	0.56475544
135	6.5	5.338322163	1.161677837
136	6.5	5.495386124	1.004613876
137	5	5.539385796	-0.539385796
138	5	5.352468491	-0.352468491
139	5	5.465771198	-0.465771198
140	5	5.424429417	-0.424429417
141	4.5	5.258389473	-0.758389473
142	5	5.666109085	-0.666109085
143	4	5.435089588	-1.435089588
144	6.5	5.672158718	0.827841282
145	5	5.513376236	-0.513376236
146	4	5.569345951	-1.569345951
147	6	5.488323689	0.511676311
148	7	5.641883373	1.358116627
149	5	4.34969759	0.65030241
150	6	5.753661633	0.246338367
151	4	4.951035023	-0.951035023
152	9	5.535870552	3.464129448
153	5	5.194498062	-0.194498062
154	6	5.172713757	0.827286243
155	7	4.869754314	2.130245686
156	5	5.107230186	-0.107230186
157	3.5	4.725539207	-1.225539207
158	5	4.329235554	0.670764446
159	3	4.784959316	-1.784959316
160	5.5	5.33180809	0.16819191
161	4	5.229773998	-1.229773998
162	4	5.717526913	-1.717526913
163	5	5.581368446	-0.581368446
164	5.5	5.403674126	0.096325874
165	6	5.687711239	0.312288761
166	6	5.460346222	0.539653778
167	5	5.587179661	-0.587179661
168	5	5.593662262	-0.593662262
169	6	5.484466076	0.515533924
170	5	5.434510708	-0.434510708
171	5.5	5.785997868	-0.285997868
172	5	5.610911846	-0.610911846
173	4.5	5.636238575	-1.136238575

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174	5	5.721231937	-0.721231937
175	5	5.399703026	-0.399703026
176	5	5.619132996	-0.619132996
177	5	5.538900852	-0.538900852
178	3	5.318590164	-2.318590164
179	4	4.869519234	-0.869519234
180	8	5.237400055	2.762599945
181	5	4.8188591	0.1811409
182	5	5.128045082	-0.128045082
183	5.5	5.380552769	0.119447231
184	2	3.466628551	-1.466628551
185	5	5.477133274	-0.477133274
186	5.5	5.282322884	0.217677116
187	5	5.541558266	-0.541558266
188	6	5.914647579	0.085352421
189	5	4.023962498	0.976037502
190	7	6.081413269	0.918586731
191	4	5.048773766	-1.048773766
192	8	5.482509613	2.517490387
193	3	3.825558662	-0.825558662
194	2	3.960865021	-1.960865021
195	7	6.172883987	0.827116013
196	4.5	4.994153976	-0.494153976
197	4.5	4.638517857	-0.138517857

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Neural network output of Ca-SCP5-SC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	4.830671787	1.169328213
2	5	5.204325676	-0.204325676
3	5	5.170952797	-0.170952797
4	6	4.789486885	1.210513115
5	4	4.639390945	-0.639390945
6	6	4.994745255	1.005254745
7	5	4.774907112	0.225092888
8	4	5.120163918	-1.120163918
9	4	4.632253647	-0.632253647
10	5	5.178367615	-0.178367615
11	5	5.090886116	-0.090886116
12	6	5.057298183	0.942701817
13	5.5	4.579993725	0.920006275
14	5.5	5.265907764	0.234092236
15	4	4.127882957	-0.127882957
16	4.5	4.834655762	-0.334655762
17	2	3.153914213	-1.153914213
18	5	4.469265461	0.530734539
19	7	5.133287907	1.866712093
20	5.5	5.818184376	-0.318184376
21	2	3.543162107	-1.543162107
22	5	4.788464069	0.211535931
23	2.5	3.995404005	-1.495404005
24	5.5	4.599127769	0.900872231
25	2	3.929410219	-1.929410219
26	6	3.764067173	2.235932827
27	7	5.130213737	1.869786263
28	5	4.141891956	0.858108044
29	8	5.939265251	2.060734749
30	2	4.031160355	-2.031160355
31	3	3.45672965	-0.45672965
32	4	4.029296875	-0.029296875
33	6.5	4.251531124	2.248468876
34	6	5.346338272	0.653661728
35	2	3.524446249	-1.524446249
36	7	4.614202976	2.385797024
37	5	4.208367348	0.791632652
38	5.5	3.42482996	2.07517004
39	6	5.05877924	0.94122076
40	4	4.834354401	-0.834354401
41	6	3.860463858	2.139536142

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42	4	4.626333237	-0.626333237
43	5.5	5.260906696	0.239093304
44	6	5.156341553	0.843658447
45	6	5.328447819	0.671552181
46	4.5	5.191526413	-0.691526413
47	5	4.735136986	0.264863014
48	3	4.369701385	-1.369701385
49	6	5.310091019	0.689908981
50	5.5	4.960371017	0.539628983
51	5	4.677278519	0.322721481
52	5.5	5.265501022	0.234498978
53	6	5.035096169	0.964903831
54	6	4.861567974	1.138432026
55	6.5	4.757884502	1.742115498
56	6.5	4.914402485	1.585597515
57	5	5.350670815	-0.350670815
58	5	4.853448391	0.146551609
59	5	5.086141586	-0.086141586
60	5	5.084961891	-0.084961891
61	4.5	4.933254719	-0.433254719
62	5	5.136788368	-0.136788368
63	4	5.071614265	-1.071614265
64	6.5	5.177202702	1.322797298
65	5	4.887761593	0.112238407
66	4	4.916265011	-0.916265011
67	6	4.912862301	1.087137699
68	7	5.358906746	1.641093254
69	5	4.042044163	0.957955837
70	6	5.422880173	0.577119827
71	4	3.962992907	0.037007093
72	9	5.424385071	3.575614929
73	5	4.580217838	0.419782162
74	6	5.166479588	0.833520412
75	7	4.316666603	2.683333397
76	5	4.817358971	0.182641029
77	3.5	4.216746807	-0.716746807
78	5	3.619688511	1.380311489
79	3	3.830789804	-0.830789804
80	5.5	4.260121346	1.239878654
81	4	4.320625782	-0.320625782
82	4	4.884094238	-0.884094238
83	5	5.159692287	-0.159692287
84	5.5	4.985146999	0.514853001
85	6	5.225086689	0.774913311

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86	6	4.582712173	1.417287827
87	5	5.273078918	-0.273078918
88	5	4.758877754	0.241122246
89	6	4.916745663	1.083254337
90	5	4.838650227	0.161349773
91	5.5	5.603643894	-0.103643894
92	5	5.209044933	-0.209044933
93	4.5	4.838650227	-0.338650227
94	5	5.282571793	-0.282571793
95	5	4.931313038	0.068686962
96	5	5.035096169	-0.035096169
97	5	4.867814541	0.132185459
98	3	5.039013386	-2.039013386
99	4	4.386434078	-0.386434078
100	8	4.437408924	3.562591076
101	5	4.291226387	0.708773613
102	5	4.302408218	0.697591782
103	5.5	4.677278519	0.822721481
104	2	2.673924446	-0.673924446
105	5	5.340228081	-0.340228081
106	5.5	4.598598957	0.901401043
107	5	4.97950983	0.02049017
108	6	5.422880173	0.577119827
109	5	3.522551537	1.477448463
110	7	5.553678989	1.446321011
111	4	4.610293865	-0.610293865
112	8	4.804583073	3.195416927
113	3	3.184915304	-0.184915304
114	2	3.184915304	-1.184915304
115	7	5.580893517	1.419106483
116	4.5	4.486483574	0.013516426
117	4.5	4.530310154	-0.030310154

Neural network output of Ca-SCP5-SC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	6	4.599568844	1.400431156
2	5	4.914608479	0.085391521
3	5	4.962560654	0.037439346
4	6	4.79030323	1.20969677
5	4	4.711667538	-0.711667538
6	6	4.957193375	1.042806625
7	5	4.600352287	0.399647713
8	4	4.756361485	-0.756361485
9	4	5.030779839	-1.030779839
10	5	5.088148594	-0.088148594
11	5	4.587900639	0.412099361
12	6	4.986793041	1.013206959
13	5.5	4.445978165	1.054021835
14	5.5	5.13167572	0.36832428
15	4	4.182919979	-0.182919979
16	4.5	4.719093323	-0.219093323
17	2	3.109833241	-1.109833241
18	5	3.969475031	1.030524969
19	7	5.157205105	1.842794895
20	5.5	5.635300636	-0.135300636
21	2	3.099486351	-1.099486351
22	5	4.304578781	0.695421219
23	2.5	3.809803009	-1.309803009
24	5.5	4.216625214	1.283374786
25	2	3.367747307	-1.367747307
26	6	3.075922728	2.924077272
27	7	5.001966476	1.998033524
28	5	4.021764278	0.978235722
29	8	5.785505295	2.214494705
30	2	3.90878582	-1.90878582
31	3	3.271890402	-0.271890402
32	4	3.895803213	0.104196787
33	6.5	3.688583136	2.811416864
34	6	5.073826313	0.926173687
35	2	3.235605478	-1.235605478
36	7	4.528705597	2.471294403
37	5	4.216789246	0.783210754
38	5.5	3.070665836	2.429334164
39	6	4.89879179	1.10120821
40	4	4.722627163	-0.722627163
41	6	3.610707521	2.389292479

42	4	4.42987442	-0.42987442
43	5.5	4.804178238	0.695821762
44	6	4.785024643	1.214975357
45	6	4.945388317	1.054611683
46	4.5	5.006318092	-0.506318092
47	5	4.837792873	0.162207127
48	3	4.714132786	-1.714132786
49	6	4.907553196	1.092446804
50	5.5	4.785221577	0.714778423
51	5	4.688712597	0.311287403
52	5.5	5.061363697	0.438636303
53	6	4.84153223	1.15846777
54	6	4.726952553	1.273047447
55	6.5	4.679430008	1.820569992
56	6.5	4.758674145	1.741325855
57	5	5.049943447	-0.049943447
58	5	4.610812664	0.389187336
59	5	4.814057827	0.185942173
60	5	4.769730091	0.230269909
61	4.5	4.64109087	-0.14109087
62	5	4.991508007	0.008491993
63	4	4.986457825	-0.986457825
64	6.5	5.080597401	1.419402599
65	5	4.771728039	0.228271961
66	4	4.724309444	-0.724309444
67	6	4.771337509	1.228662491
68	7	5.05679512	1.94320488
69	5	3.749704123	1.250295877
70	6	5.16687727	0.83312273
71	4	3.838949203	0.161050797
72	9	5.060267925	3.939732075
73	5	4.78657198	0.21342802
74	6	4.810394764	1.189605236
75	7	4.185681343	2.814318657
76	5	4.382114887	0.617885113
77	3.5	3.905329466	-0.405329466
78	5	3.367400169	1.632599831
79	3	4.155571938	-1.155571938
80	5.5	4.359050751	1.140949249
81	4	4.14956665	-0.14956665
82	4	4.940515995	-0.940515995
83	5	5.019604683	-0.019604683
84	5.5	4.824786186	0.675213814
85	6	5.080610752	0.919389248

86	6	4.657505512	1.342494488
87	5	4.785607815	0.214392185
88	5	4.833030224	0.166969776
89	6	5.014428139	0.985571861
90	5	4.667894363	0.332105637
91	5.5	5.188812733	0.311187267
92	5	4.902489662	0.097510338
93	4.5	4.679214954	-0.179214954
94	5	5.071951866	-0.071951866
95	5	4.670684338	0.329315662
96	5	4.926774979	0.073225021
97	5	4.743722439	0.256277561
98	3	4.299394131	-1.299394131
99	4	4.084578037	-0.084578037
100	8	4.294781208	3.705218792
101	5	3.870475292	1.129524708
102	5	4.046643734	0.953356266
103	5.5	4.61339426	0.88660574
104	2	2.505736113	-0.505736113
105	5	4.669846058	0.330153942
106	5.5	4.361291885	1.138708115
107	5	4.910848141	0.089151859
108	6	5.468690872	0.531309128
109	5	3.120172739	1.879827261
110	7	5.557892799	1.442107201
111	4	4.370162487	-0.370162487
112	8	4.871265888	3.128734112
113	3	2.818281174	0.181718826
114	2	3.063263655	-1.063263655
115	7	5.535227299	1.464772701
116	4.5	4.336047173	0.163952827
117	4.5	4.004358768	0.495641232

Neural network output of Ca-SCP5-MC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	4.468611717	-0.468611717
2	3	3.618456364	-0.618456364
3	7	6.218318939	0.781681061
4	4	5.943423271	-1.943423271
5	5	5.620333195	-0.620333195
6	9	9.253884315	-0.253884315
7	5	5.740502357	-0.740502357
8	6.5	5.325647354	1.174352646
9	8	6.591571808	1.408428192
10	5.5	5.769502163	-0.269502163
11	5	5.894089222	-0.894089222
12	4	6.075323105	-2.075323105
13	4	4.557923794	-0.557923794
14	8	6.35986805	1.64013195
15	6	6.664480209	-0.664480209
16	5	7.139769077	-2.139769077
17	4	5.743396759	-1.743396759
18	3.5	4.933390617	-1.433390617
19	3	5.413017273	-2.413017273
20	5	4.369540215	0.630459785
21	5	6.373180866	-1.373180866
22	3	4.818964958	-1.818964958
23	3	6.004365444	-3.004365444
24	3.5	5.175266266	-1.675266266
25	4.5	6.903563023	-2.403563023
26	2.5	3.969522715	-1.469522715
27	6	6.35986805	-0.35986805
28	6	6.321005821	-0.321005821
29	6	6.299683094	-0.299683094
30	8	6.018040657	1.981959343
31	4.5	5.847546101	-1.347546101
32	9	6.525853157	2.474146843
33	7	6.032907486	0.967092514
34	5	6.6812253	-1.6812253
35	6.5	6.849781036	-0.349781036
36	5.5	6.648697376	-1.148697376
37	8	6.753036976	1.246963024
38	9	8.748638153	0.251361847
39	5.5	6.105668545	-0.605668545
40	3	6.208331585	-3.208331585
41	5	5.970596313	-0.970596313
42	7.5	6.727871895	0.772128105
43	7	7.006338596	-0.006338596
44	4	3.882545948	0.117454052
45	5.5	6.933311939	-1.433311939
46	6	6.875732422	-0.875732422
47	6	6.042445183	-0.042445183
48	5	6.630047798	-1.630047798
49	8	7.002258778	0.997741222
50	6	6.258455276	-0.258455276
51	5.5	5.391798019	0.108201981
52	4	4.354969978	-0.354969978
53	5	6.600273132	-1.600273132
54	3	6.52060461	-3.52060461
55	5	6.264762402	-1.264762402

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Neural network output of Ca-SCP5-MC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	4.660066128	-0.660066128
2	3	4.189005375	-1.189005375
3	7	5.528775215	1.471224785
4	4	5.486486435	-1.486486435
5	5	5.577905178	-0.577905178
6	9	8.121845245	0.878154755
7	5	6.545320034	-1.545320034
8	6.5	5.404934883	1.095065117
9	8	6.906840801	1.093159199
10	5.5	5.784650803	-0.284650803
11	5	5.531784534	-0.531784534
12	4	6.157649994	-2.157649994
13	4	4.957103252	-0.957103252
14	8	5.915514946	2.084485054
15	6	6.08489275	-0.08489275
16	5	6.759308815	-1.759308815
17	4	6.547121525	-2.547121525
18	3.5	5.295053482	-1.795053482
19	3	5.634002686	-2.634002686
20	5	4.462880611	0.537119389
21	5	7.42684269	-2.42684269
22	3	5.27770853	-2.27770853
23	3	5.732208729	-2.732208729
24	3.5	5.539869785	-2.039869785
25	4.5	7.044517517	-2.544517517
26	2.5	4.745695591	-2.245695591
27	6	6.243102551	-0.243102551
28	6	5.934206963	0.065793037
29	6	6.673302174	-0.673302174
30	8	6.236120224	1.763879776
31	4.5	5.731194019	-1.231194019
32	9	6.272672653	2.727327347
33	7	6.410549164	0.589450836
34	5	7.197339535	-2.197339535
35	6.5	7.06265831	-0.56265831
36	5.5	6.314448833	-0.814448833
37	8	7.009604931	0.990395069
38	9	7.461497784	1.538502216
39	5.5	6.452082634	-0.952082634
40	3	6.354830742	-3.354830742
41	5	7.724775314	-2.724775314
42	7.5	6.952165604	0.547834396
43	7	7.296128273	-0.296128273
44	4	4.400048256	-0.400048256
45	5.5	6.893091202	-1.393091202
46	6	6.856526852	-0.856526852
47	6	5.950994492	0.049005508
48	5	5.640315533	-0.640315533
49	8	6.725421429	1.274578571
50	6	6.556621552	-0.556621552
51	5.5	5.949450983	-0.449460983
52	4	4.715441704	-0.715441704
53	5	5.348000526	-0.348000526
54	3	6.399512768	-3.399512768
55	5	5.894001961	-0.894001961

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Neural network output of Ca-SCPS-CC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	3.658196688	0.341803312
2	6	6.153332233	-0.153332233
3	3	6.163723469	-3.163723469
4	2	3.608688831	-1.608688831
5	4.5	5.594216824	-1.094216824
6	4.5	4.554410458	-0.054410458
7	7.5	7.790585518	-0.290585518
8	4	4.422040939	-0.422040939
9	7	6.767796516	0.232203484
10	3	4.039776802	-1.039776802
11	5	5.646402836	-0.646402836
12	7	6.3435812	0.6564188
13	7	6.922998905	0.077001095
14	4	4.69761467	-0.69761467
15	6.5	7.146074295	-0.646074295
16	5	4.859660625	0.140339375
17	4	3.404330015	0.595669985
18	5.5	5.134931087	0.365068913
19	7.5	7.612319946	-0.112319946
20	8	7.729074955	0.270925045
21	9	8.707238197	0.292761803
22	6	5.963841438	0.036158562
23	6	6.481381416	-0.481381416
24	3.5	4.648459911	-1.148459911
25	5	4.18939352	0.81060648

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Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	4.582691669	-0.582691669
2	6	5.567082405	0.432917595
3	3	5.192287922	-2.192287922
4	2	3.536665201	-1.536665201
5	4.5	6.212464333	-1.712464333
6	4.5	3.564433813	0.935566187
7	7.5	6.580803394	0.919196606
8	4	4.799911022	-0.799911022
9	7	6.495284557	0.504715443
10	3	4.780209064	-1.780209064
11	5	5.890748501	-0.890748501
12	7	5.367067814	1.632932186
13	7	5.560394287	1.439605713
14	4	4.497733593	-0.497733593
15	6.5	6.843229294	-0.343229294
16	5	5.102008343	-0.102008343
17	4	4.087873936	-0.087873936
18	5.5	6.167410851	-0.667410851
19	7.5	7.291079998	0.208920002
20	8	5.985927105	2.014072895
21	9	7.43984127	1.56015873
22	6	6.087954998	-0.087954998
23	6	5.736886978	0.263113022
24	3.5	5.370550156	-1.870550156
25	5	5.267891884	-0.267891884

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Neural network outputs of the SCP6 analysis

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.306078911	0.193921089
2	4.5	4.198280334	0.301719666
3	4	4.969820023	-0.969820023
4	6	4.668626785	1.331373215
5	5.5	4.451771736	1.048228264
6	7.5	5.998907566	1.501092434
7	8	6.442265034	1.557734966
8	4	4.875757694	-0.875757694
9	6	6.543076515	-0.543076515
10	5	6.16977644	-1.16977644
11	6	4.960294724	1.039705276
12	6	4.875757694	1.124242306
13	4	4.53656292	-0.53656292
14	4	4.367092133	-0.367092133
15	8	4.367092133	3.632907867
16	4	5.105134487	-1.105134487
17	4.5	6.153850555	-1.553850651
18	4	4.706262589	-0.706262589
19	2.5	4.583754539	-2.083754539
20	3	4.367092133	-1.367092133
21	6.5	6.470224857	0.029775143
22	4	4.245154858	-0.245154858
23	4	5.016462326	-1.016462326
24	3	5.351706505	-2.351706505
25	3	5.351706505	-2.351706505
26	3	5.016462326	-2.016462326
27	7	4.367092133	2.632907867
28	4	5.769201756	-1.769201756
29	5	6.259870052	-1.259870052
30	9	5.351706505	3.648293495
31	6	5.212431908	0.787568092
32	3	5.230806351	-2.230806351
33	5.5	5.840910912	-0.340910912
34	7	6.755832195	0.244167805
35	5	6.429937363	-1.429937363
36	4	4.922908783	-0.922908783
37	6.5	6.16977644	0.33022356
38	4	5.553393364	-1.553393364
39	7	6.127890587	0.872109413
40	4.5	5.928761005	-1.428761005
41	6	6.614975929	-0.614975929

42	6	6.085437775	-0.085437775
43	8	6.280646324	1.719353676
44	3	4.53656292	-1.53656292
45	4.5	4.706262589	-0.206262589
46	5	5.516971588	-0.516971588
47	6	5.016462326	0.983537674
48	6	5.138332844	0.861667156
49	9	5.796254158	3.203745842
50	7	5.471288681	1.528711319
51	6	5.607075691	0.392924309
52	6	3.983979225	2.016020775
53	7	5.259188652	1.740811348
54	3	5.351706505	-2.351706505
55	4	4.969820023	-0.969820023
56	4	5.998907566	-1.998907566
57	7	5.751139164	1.248860836
58	4	5.724915028	-1.724915028
59	2	4.151370525	-2.151370525
60	5	6.042438507	-1.042438507
61	4.5	4.583754539	-0.083754539
62	5	6.085437775	-1.085437775
63	3	5.840910912	-2.840910912
64	8	6.429937363	1.570062637
65	5.5	5.769201756	-0.269201756
66	5	6.042438507	-1.042438507
67	5	3.864328861	1.135671139
68	6	5.351706505	0.648293495
69	5	5.351706505	-0.351706505
70	7	6.280646324	0.719353676
71	4	5.724915028	-1.724915028
72	8	5.928761005	2.071238995
73	6	6.280646324	-0.280646324
74	8	6.717294216	1.282705784
75	6	6.470224857	-0.470224857
76	9	5.425218105	3.574781895
77	6	6.238948822	-0.238948822
78	5	5.724915028	-0.724915028
79	4	6.196678162	-2.196678162
80	6	5.516971588	0.483028412
81	5.5	5.562242031	-0.062242031
82	7	6.162605762	0.837394238
83	5.5	6.085437775	-0.585437775
84	6	5.598846436	0.401153564
85	7	5.471288681	1.528711319

86	5.5	5.964133739	-0.464133739
87	5.5	5.885086536	-0.385086536
88	5.5	5.607075691	-0.107075691
89	5.5	5.942266941	-0.442266941
90	6	6.085437775	-0.085437775
91	5.5	6.106733322	-0.606733322
92	6	6.085437775	-0.085437775
93	5	5.805333614	-0.805333614
94	5.5	5.805333614	-0.305333614
95	3.5	5.305622101	-1.805622101
96	8.5	5.411677361	3.088322639
97	4	4.53656292	-0.53656292
98	4.5	5.016462326	-0.516462326
99	7.5	5.724915028	1.775084972
100	4.5	6.429937363	-1.929937363
101	5.5	5.351706505	0.148293495
102	6	5.480074406	0.519925594
103	4	4.969820023	-0.969820023
104	5.5	5.769201756	-0.269201756
105	4.5	4.84729147	-0.34729147
106	4.5	4.198280334	0.301719666
107	7.5	5.964133739	1.535866261
108	1.5	4.367092133	-2.867092133
109	7.5	6.523223877	0.976776123
110	3.5	4.922908783	-1.422908783
111	3.5	4.583754539	-1.083754539
112	3.5	5.305622101	-1.805622101
113	6.5	5.971914768	0.528085232
114	8.5	6.07148695	2.42851305
115	5.5	4.198280334	1.301719666
116	5.5	5.516971588	-0.016971588
117	5.5	5.621413708	-0.121413708
118	5.5	4.414169312	1.085830688
119	4.5	5.305622101	-0.805622101
120	3.5	5.516971588	-2.016971588
121	4.5	5.230806351	-0.730806351
122	3.5	5.724915028	-2.224915028
123	4.5	5.442723274	-0.942723274
124	3.5	5.849322319	-2.349322319
125	4.5	5.747118473	-1.247118473
126	4.5	6.238948822	-1.738948822
127	3.5	5.305622101	-1.805622101
128	3.5	5.425218105	-1.925218105
129	4.5	5.480074406	-0.980074406

130	6.5	5.928761005	0.571238995
131	4.5	5.553393364	-1.053393364
132	4.5	5.928761005	-1.428761005
133	5.5	5.928761005	-0.428761005
134	5.5	5.621413708	-0.121413708
135	5.5	5.305622101	0.194377899
136	4.5	5.724915028	-1.224915028
137	5.5	5.928761005	-0.428761005
138	6	5.516971588	0.483028412
139	5.5	5.584714413	-0.084714413
140	7.5	5.562242031	1.937757969
141	5.5	5.885086536	-0.385086536
142	4.5	5.885086536	-1.385086536
143	5.5	5.985871315	-0.485871315
144	4.5	5.985871315	-1.485871315
145	5.5	5.985871315	-0.485871315
146	7.5	6.028951645	1.471048355
147	5.5	5.434576035	0.065423965
148	6	6.183717728	-0.183717728
149	5.5	4.739112377	0.760887623
150	7.5	6.085437775	1.414562225
151	3.5	4.53656292	-1.03656292
152	7.5	5.840910912	1.659089088
153	5.5	6.251391411	-0.751391411
154	5.5	5.971914768	-0.471914768
155	7.5	5.184738159	2.315261841
156	7.5	5.607075691	1.892924309
157	4.5	4.53656292	-0.03656292
158	5.5	4.47535944	1.02464056
159	3.5	5.138332844	-1.638332844
160	5.5	5.138332844	0.361667156
161	5.5	5.562242031	-0.062242031
162	5.5	6.042438507	-0.542438507
163	6	5.928761005	0.071238995
164	5	5.885086536	-0.885086536
165	6.5	5.906987667	0.593012333
166	6	5.805333614	0.194666386
167	6	5.607075691	0.392924309
168	6	5.680157185	0.319842815
169	5.5	5.964133739	-0.464133739
170	5.5	5.621413708	-0.121413708
171	6.5	5.928761005	0.571238995
172	6	5.562242031	0.437757969
173	5.5	5.70259285	-0.20259285

Neural network output of Ca-SCP6-AR-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.300419331	0.199580669
2	4.5	3.823040724	0.676959276
3	4	4.408288956	-0.408288956
4	6	4.685441017	1.314558983
5	5.5	4.79535532	0.70464468
6	7.5	5.848967075	1.651032925
7	8	5.870149612	2.129850388
8	4	4.765090942	-0.765090942
9	6	6.044806957	-0.044806957
10	5	5.287006378	-0.287006378
11	6	4.766125679	1.233874321
12	6	4.645731449	1.354268551
13	4	4.083620548	-0.083620548
14	4	4.123384953	-0.123384953
15	8	4.013971806	3.986028194
16	4	5.933008194	-1.933008194
17	4.5	5.761193275	-1.161193371
18	4	4.152868748	-0.152868748
19	2.5	4.208220005	-1.708220005
20	3	4.130596161	-1.130596161
21	6.5	6.560083389	-0.060083389
22	4	4.480668068	-0.480668068
23	4	5.817979813	-1.817979813
24	3	4.606517315	-1.606517315
25	3	5.501578331	-2.501578331
26	3	4.555263042	-1.555263042
27	7	4.371844769	2.628155231
28	4	5.703711987	-1.703711987
29	5	6.09135294	-1.09135294
30	9	5.218193531	3.781806469
31	6	5.293649197	0.706350803
32	3	5.545851231	-2.545851231
33	5.5	5.785219193	-0.285219193
34	7	6.594368458	0.405631542
35	5	6.44716835	-1.44716835
36	4	4.592618942	-0.592618942
37	6.5	6.133038998	0.366961002
38	4	4.897147179	-0.897147179
39	7	5.788167477	1.211832523
40	4.5	5.656322002	-1.156322002
41	6	6.417779922	-0.417779922

42	6	6.22846508	-0.22846508
43	8	6.423984051	1.576015949
44	3	4.671747684	-1.671747684
45	4.5	4.7973032	-0.2973032
46	5	5.772046566	-0.772046566
47	6	5.541448116	0.458551884
48	6	5.574182987	0.425817013
49	9	5.675010204	3.324989796
50	7	5.479111195	1.520888805
51	6	5.746246815	0.253753185
52	6	4.208890915	1.791109085
53	7	5.576311588	1.423688412
54	3	5.176941872	-2.176941872
55	4	5.188232422	-1.188232422
56	4	5.484572411	-1.484572411
57	7	5.799681187	1.200318813
58	4	5.582487106	-1.582487106
59	2	3.764299631	-1.764299631
60	5	6.294351578	-1.294351578
61	4.5	4.017769814	0.482230186
62	5	6.162023067	-1.162023067
63	3	5.459245205	-2.459245205
64	8	6.518671989	1.481328011
65	5.5	5.403317928	0.096682072
66	5	6.075192928	-1.075192928
67	5	4.472151279	0.527848721
68	6	5.637250423	0.362749577
69	5	5.288415909	-0.288415909
70	7	6.556863785	0.443136215
71	4	5.597507477	-1.597507477
72	8	5.220757008	2.779242992
73	6	6.08438158	-0.08438158
74	8	6.978192806	1.021807194
75	6	6.109896183	-0.109896183
76	9	5.914970398	3.085029602
77	6	6.138565063	-0.138565063
78	5	5.811590195	-0.811590195
79	4	5.859335423	-1.859335423
80	6	5.37686491	0.62313509
81	5.5	5.851472855	-0.351472855
82	7	5.936253548	1.063746452
83	5.5	6.016055107	-0.516055107
84	6	5.712195873	0.287804127
85	7	5.549408913	1.450591087

86	5.5	5.8866148	-0.3866148
87	5.5	5.690579414	-0.190579414
88	5.5	5.739757061	-0.239757061
89	5.5	5.84778738	-0.34778738
90	6	5.937962055	0.062037945
91	5.5	5.826426983	-0.326426983
92	6	5.973653793	0.026346207
93	5	5.647062778	-0.647062778
94	5.5	5.827757359	-0.327757359
95	3.5	5.240186691	-1.740186691
96	8.5	5.544685364	2.955314636
97	4	4.530228138	-0.530228138
98	4.5	5.013713837	-0.513713837
99	7.5	5.943425655	1.556574345
100	4.5	6.624456406	-2.124456406
101	5.5	4.907027245	0.592972755
102	6	5.388950348	0.611049652
103	4	4.680505276	-0.680505276
104	5.5	5.606009007	-0.106009007
105	4.5	4.682349682	-0.182349682
106	4.5	4.684898853	-0.184898853
107	7.5	6.101053715	1.398946285
108	1.5	5.176421165	-3.676421165
109	7.5	6.575380802	0.924619198
110	3.5	4.706562996	-1.206562996
111	3.5	4.497899532	-0.997899532
112	3.5	5.013697147	-1.513697147
113	6.5	5.119896889	1.380103111
114	8.5	5.826770782	2.673229218
115	5.5	4.501543045	0.998456955
116	5.5	5.509137154	-0.009137154
117	5.5	5.727334023	-0.227334023
118	5.5	3.998616457	1.501383543
119	4.5	5.679905891	-1.179905891
120	3.5	5.381821632	-1.881821632
121	4.5	5.179152966	-0.679152966
122	3.5	5.672589302	-2.172589302
123	4.5	5.61154747	-1.11154747
124	3.5	5.895195484	-2.395195484
125	4.5	5.784856796	-1.284856796
126	4.5	6.216425896	-1.716425896
127	3.5	5.67037487	-2.17037487
128	3.5	5.131954193	-1.631954193
129	4.5	5.781619072	-1.281619072

174	6	6.162605762	-0.162605762
175	7	5.871128559	1.128871441
176	7	6.007478237	0.992521763
177	6.5	5.434576035	1.065423965
178	7.5	5.351706505	2.148293495
179	7.5	5.100738049	2.399261951
180	5.5	5.885086536	-0.385086536
181	8.5	5.516971588	2.983028412
182	6	4.706262589	1.293737411
183	7	5.305622101	1.694377899
184	3.5	3.983979225	-0.483979225
185	5.5	5.812998772	-0.312998772
186	5.5	5.351706505	0.148293495
187	6.5	6.085437775	0.414562225
188	6	6.38904047	-0.38904047
189	4	4.198280334	-0.198280334
190	8.5	6.575546741	1.924453259
191	4.5	5.397414684	-0.897414684
192	6.5	5.516971588	0.983028412
193	3	4.198280334	-1.198280334
194	2.5	4.198280334	-1.698280334
195	8.5	6.429937363	2.070062637
196	7	5.351706505	1.648293495
197	7.5	5.062808514	2.437191486

[illegible]	[illegible]	[illegible]	[illegible]
131	4.5	5.79946661	-1.29946661
132	4.5	6.073426723	-1.573426723
133	5.5	5.999829292	-0.499829292
134	5.5	5.555531025	-0.055531025
135	5.5	5.55977869	-0.05977869
136	4.5	5.547075272	-1.047075272
137	5.5	6.068941116	-0.568941116
138	6	5.796792984	0.203207016
139	5.5	5.817842007	-0.317842007
140	7.5	5.768335342	1.731664658
141	5.5	5.720306873	-0.220306873
142	4.5	5.887402534	-1.387402534
143	5.5	6.293452263	-0.793452263
144	4.5	6.06170702	-1.56170702
145	5.5	5.876533508	-0.376533508
146	7.5	5.884211063	1.615788937
147	5.5	5.394461632	0.105538368
148	6	6.009545803	-0.009545803
149	5.5	4.728578568	0.771421432
150	7.5	6.401609421	1.098390579
151	3.5	5.324211597	-1.824211597
152	7.5	6.067016602	1.432983398
153	5.5	5.60488224	-0.10488224
154	5.5	5.538592815	-0.038592815
155	7.5	5.241387844	2.258612156
156	7.5	5.509016514	1.990983486
157	4.5	5.095947742	-0.595947742
158	5.5	4.336791992	1.163208008
159	3.5	4.766560078	-1.266560078
160	5.5	5.287016392	0.212983608
161	5.5	5.521439552	-0.021439552
162	5.5	5.963246346	-0.463246346
163	6	6.0377841	-0.0377841
164	5	5.852649212	-0.852649212
165	6.5	5.999090195	0.500909805
166	6	5.60835886	0.39164114
167	6	5.918985844	0.081014156
168	6	5.760562897	0.239437103
169	5.5	5.878268719	-0.378268719
170	5.5	5.652830601	-0.152830601
171	6.5	6.176362514	0.323637486
172	6	5.850587368	0.149412632
173	5.5	5.704627037	-0.204627037

174	6	5.726492882	0.273507118
175	7	5.725013733	1.274986267
176	7	6.14814806	0.85185194
177	6.5	5.681059361	0.818940639
178	7.5	5.893834591	1.606165409
179	7.5	4.901706696	2.598293304
180	5.5	5.437847614	0.062152386
181	8.5	5.180537224	3.319462776
182	6	5.360934734	0.639065266
183	7	5.680834293	1.319165707
184	3.5	3.585958242	-0.085958242
185	5.5	5.952732086	-0.452732086
186	5.5	5.511509895	-0.011509895
187	6.5	5.996291637	0.503708363
188	6	6.445712566	-0.445712566
189	4	3.958456993	0.041543007
190	8.5	6.539503098	1.960496902
191	4.5	5.317292213	-0.817292213
192	6.5	5.358235359	1.141764641
193	3	3.893324375	-0.893324375
194	2.5	4.108557701	-1.608557701
195	8.5	6.495882511	2.004117489
196	7	5.302098751	1.697901249
197	7.5	5.22799921	2.27200079

Neural network output of Ca-SCP6-SC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5.5	4.88605547	0.61394453
2	7	5.706278801	1.293721199
3	5.5	5.648963451	-0.148963451
4	6	4.889467716	1.110532284
5	7	4.756204128	2.243795872
6	5.5	5.405426502	0.094573498
7	5.5	5.343963146	0.156036854
8	5.5	5.706278801	-0.206278801
9	5.5	5.055494308	0.444505692
10	6	5.470549583	0.529450417
11	5.5	5.850073338	-0.350073338
12	6	5.470549583	0.529450417
13	5	5.217967033	-0.217967033
14	5.5	5.217967033	0.282032967
15	3.5	4.756204128	-1.256204128
16	8.5	4.923774719	3.576225281
17	4	3.841747046	0.158252954
18	4.5	4.683058739	-0.183058739
19	7.5	5.281471252	2.218528748
20	4.5	6.092021942	-1.592021942
21	5.5	5.088047981	0.411952019
22	6	5.021594048	0.978405952
23	4	4.261275291	-0.261275291
24	5.5	5.590565205	-0.090565205
25	4.5	4.821490288	-0.321490288
26	4.5	3.767994165	0.732005835
27	7.5	5.343963146	2.156036854
28	1.5	3.176386595	-1.676386595
29	7.5	5.968149662	1.531850338
30	3.5	4.124851227	-0.624851227
31	3.5	3.681025267	-0.181025267
32	3.5	4.33390379	-0.83390379
33	6.5	5.410105228	1.089894772
34	8.5	5.858807087	2.641192913
35	5.5	3.767994165	1.732005835
36	5.5	4.889467716	0.610532284
37	5.5	4.98918581	0.51081419
38	5.5	3.829942942	1.670057058
39	4.5	4.33390379	0.16609621
40	3.5	4.683058739	-1.183058739
41	4.5	4.747114658	-0.247114658

42	3.5	5.021594048	-1.521594048
43	4.5	5.085731506	-0.585731506
44	3.5	5.706278801	-2.206278801
45	4.5	5.498596191	-0.998596191
46	4.5	5.706278801	-1.206278801
47	3.5	4.548218727	-1.048218727
48	3.5	4.124851227	-0.624851227
49	4.5	5.281471252	-0.781471252
50	6.5	5.470549583	1.029450417
51	4.5	4.756204128	-0.256204128
52	4.5	5.346315861	-0.846315861
53	5.5	5.706278801	-0.206278801
54	5.5	4.98918581	0.51081419
55	5.5	4.618308067	0.881691933
56	4.5	5.281471252	-0.781471252
57	5.5	5.590565205	-0.090565205
58	6	4.821490288	1.178509712
59	5.5	5.314016819	0.185983181
60	7.5	5.281471252	2.218528748
61	5.5	5.405426502	0.094573498
62	4.5	5.465847015	-0.965847015
63	5.5	5.376583099	0.123416901
64	4.5	5.438114643	-0.938114643
65	5.5	5.616368294	-0.116368294
66	7.5	5.681284904	1.818715096
67	5.5	4.889467716	0.610532284
68	6	5.738641262	0.261358738
69	5.5	4.071662426	1.428337574
70	7.5	5.817647934	1.682352066
71	3.5	3.915245533	-0.415245533
72	7.5	4.821490288	2.678509712
73	5.5	4.853871822	0.646128178
74	5.5	5.770711899	-0.270711899
75	7.5	4.397420883	3.102579117
76	7.5	5.346315861	2.153684139
77	4.5	3.323651552	1.176348448
78	5.5	3.50176096	1.99823904
79	3.5	4.188138485	-0.688138485
80	5.5	4.890807629	0.609192371
81	5.5	5.525212288	-0.025212288
82	5.5	5.405426502	0.094573498
83	6	5.590565205	0.409434795
84	5	5.021594048	-0.021594048
85	6.5	5.438114643	1.061885357

86	6	5.405426502	0.594573498
87	6	5.762508392	0.237491608
88	6	5.022776604	0.977223396
89	5.5	5.217967033	0.282032967
90	5.5	5.248692513	0.251307487
91	6.5	5.531090736	0.968909264
92	6	5.465847015	0.534152985
93	5.5	5.248692513	0.251307487
94	6	5.531090736	0.468909264
95	7	5.622840405	1.377159595
96	7	5.706278801	1.293721199
97	6.5	5.088047981	1.411952019
98	7.5	5.088047981	2.411952019
99	7.5	4.541584969	2.958415031
100	5.5	5.640744686	-0.140744686
101	8.5	4.956573486	3.543426514
102	6	4.061242104	1.938757896
103	7	4.756204128	2.243795872
104	3.5	2.973315239	0.526684761
105	5.5	5.654828548	-0.154828548
106	5.5	4.956573486	0.543426514
107	6.5	5.590565205	0.909434795
108	6	5.817647934	0.182352066
109	4	3.323651552	0.676348448
110	8.5	6.092021942	2.407978058
111	4.5	4.747114658	-0.247114658
112	6.5	4.821490288	1.678509712
113	3	3.471686602	-0.471686602
114	2.5	3.471686602	-0.971686602
115	8.5	5.989302635	2.510697365
116	7	4.889467716	2.110532284
117	7.5	4.88605547	2.61394453

Neural network output of Ca-SCP6-SC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	5.5	4.526489735	0.973510265
2	7	5.388717651	1.611282349
3	5.5	5.447441101	0.052558899
4	6	4.934658527	1.065341473
5	7	4.439573765	2.560426235
6	5.5	5.344190121	0.155809879
7	5.5	5.309361458	0.190638542
8	5.5	5.375924587	0.124075413
9	5.5	4.643341541	0.856658459
10	6	5.287659645	0.712340355
11	5.5	5.323181629	0.176818371
12	6	5.215004444	0.784995556
13	5	5.085192204	-0.085192204
14	5.5	5.267193794	0.232806206
15	3.5	4.109930515	-0.609930515
16	8.5	5.024749279	3.475250721
17	4	3.87342906	0.12657094
18	4.5	4.390668392	0.109331608
19	7.5	5.023965836	2.476034164
20	4.5	5.823897839	-1.323897839
21	5.5	4.998896122	0.501103878
22	6	4.996541023	1.003458977
23	4	3.638157368	0.361842632
24	5.5	5.109887123	0.390112877
25	4.5	4.379007816	0.120992184
26	4.5	4.182980061	0.317019939
27	7.5	5.389424324	2.110575676
28	1.5	1.057773232	0.442226768
29	7.5	5.888758183	1.611241817
30	3.5	3.492130041	0.007869959
31	3.5	3.024457693	0.475542307
32	3.5	3.878464222	-0.378464222
33	6.5	5.909137726	0.590862274
34	8.5	5.423387527	3.076612473
35	5.5	3.171175718	2.328824282
36	5.5	4.884606361	0.615393639
37	5.5	4.084019184	1.415980816
38	5.5	3.329003334	2.170996666
39	4.5	4.985221386	-0.485221386
40	3.5	4.134530067	-0.634530067
41	4.5	4.272272587	0.227727413

42	3.5	5.212779045	-1.712779045
43	4.5	5.622095108	-1.122095108
44	3.5	5.391791344	-1.891791344
45	4.5	5.355505943	-0.855505943
46	4.5	5.75523138	-1.25523138
47	3.5	4.428596973	-0.928596973
48	3.5	3.67872262	-0.17872262
49	4.5	5.366745949	-0.866745949
50	6.5	5.333700657	1.166299343
51	4.5	4.479115486	0.020884514
52	4.5	5.193097591	-0.693097591
53	5.5	5.365057945	0.134942055
54	5.5	4.871675014	0.628324986
55	5.5	4.628618717	0.871381283
56	4.5	5.063241959	-0.563241959
57	5.5	5.235172272	0.264827728
58	6	4.694525719	1.305474281
59	5.5	5.241616726	0.258383274
60	7.5	5.119769096	2.380230904
61	5.5	5.135966301	0.364033699
62	4.5	5.097745895	-0.597745895
63	5.5	5.168014526	0.331985474
64	4.5	5.34134388	-0.84134388
65	5.5	5.29162693	0.20837307
66	7.5	5.700824261	1.799175739
67	5.5	4.847343922	0.652656078
68	6	5.545715809	0.454284191
69	5.5	4.298461437	1.201538563
70	7.5	5.448654175	2.051345825
71	3.5	3.751399279	-0.251399279
72	7.5	5.283380032	2.216619968
73	5.5	5.030276299	0.469723701
74	5.5	5.107845783	0.392154217
75	7.5	5.092267513	2.407732487
76	7.5	5.861118793	1.638881207
77	4.5	3.577464104	0.922535896
78	5.5	3.677685499	1.822314501
79	3.5	3.572258472	-0.072258472
80	5.5	4.386758327	1.113241673
81	5.5	5.086729527	0.413270473
82	5.5	5.255489349	0.244510651
83	6	5.32442379	0.67557621
84	5	5.108456135	-0.108456135
85	6.5	5.188941479	1.311058521

86	6	5.206936359	0.793063641
87	6	5.351566315	0.648433685
88	6	4.963418007	1.036581993
89	5.5	4.928256512	0.571743488
90	5.5	5.153478146	0.346521854
91	6.5	5.584251404	0.915748596
92	6	5.250835896	0.749164104
93	5.5	5.244967937	0.255032063
94	6	5.460033417	0.539966583
95	7	5.300003052	1.699996948
96	7	5.406564236	1.593435764
97	6.5	4.958761215	1.541238785
98	7.5	5.441537857	2.058462143
99	7.5	5.015445232	2.484554768
100	5.5	4.995789528	0.504210472
101	8.5	4.577632904	3.922367096
102	6	4.231751442	1.768248558
103	7	4.501758099	2.498241901
104	3.5	2.112093925	1.387906075
105	5.5	5.96251297	-0.46251297
106	5.5	4.980652332	0.519347668
107	6.5	5.246413231	1.253586769
108	6	5.47854805	0.52145195
109	4	3.708982229	0.291017771
110	8.5	5.626436234	2.873563766
111	4.5	4.990377903	-0.490377903
112	6.5	4.807944298	1.692055702
113	3	3.397340059	-0.397340059
114	2.5	2.752962351	-0.252962351
115	8.5	5.836455822	2.663544178
116	7	4.561285973	2.438714027
117	7.5	5.509898663	1.990101337

Neural network output of Ca-SCP6-MC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.695405483	-0.195405483
2	4.5	4.695405483	-0.195405483
3	4	5.152900219	-1.152900219
4	6	5.030598164	0.969401836
5	5.5	5.030598164	0.469401836
6	7.5	6.612455368	0.887544632
7	8	6.928440094	1.071559906
8	4	5.69254303	-1.69254303
9	6	6.14162302	-0.14162302
10	5	5.413034916	-0.413034916
11	6	5.838742733	0.161257267
12	6	5.69254303	0.30745697
13	4	5.152900219	-1.152900219
14	4	4.913588524	-0.913588524
15	8	4.913588524	3.086411476
16	4	6.29708147	-2.29708147
17	4.5	6.928440094	-2.328440189
18	4	5.413034916	-1.413034916
19	2.5	4.913588524	-2.413588524
20	3	4.913588524	-1.913588524
21	6.5	5.988626003	0.511373997
22	4	4.497782707	-0.497782707
23	4	4.913588524	-0.913588524
24	3	5.413034916	-2.413034916
25	3	5.413034916	-2.413034916
26	3	4.913588524	-1.913588524
27	7	4.913588524	2.086411476
28	4	5.413034916	-1.413034916
29	5	6.14162302	-1.14162302
30	9	5.413034916	3.586965084
31	6	6.29708147	-0.29708147
32	3	4.913588524	-1.913588524
33	5.5	6.29708147	-0.79708147
34	7	6.612455368	0.387544632
35	5	6.29708147	-1.29708147
36	4	5.413034916	-1.413034916
37	6.5	5.413034916	1.086965084
38	4	6.14162302	-2.14162302
39	7	5.69254303	1.30745697
40	4.5	5.69254303	-1.19254303
41	6	6.29708147	-0.29708147
42	6	5.988626003	0.011373997
43	8	5.988626003	2.011373997
44	3	5.152900219	-2.152900219
45	4.5	5.413034916	-0.913034916
46	5	5.69254303	-0.69254303
47	6	4.913588524	1.086411476
48	6	5.413034916	0.586965084
49	9	6.612455368	2.387544632
50	7	5.988626003	1.011373997
51	6	5.152900219	0.847099781
52	6	4.695405483	1.304594517
53	7	5.988626003	1.011373997
54	3	5.413034916	-2.413034916
55	4	5.152900219	-1.152900219

Neural network output of Ca-SCP6-MC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4.5	4.398139477	0.101860523
2	4.5	4.058204174	0.441795826
3	4	4.951342583	-0.951342583
4	6	5.265898705	0.734101295
5	5.5	6.326113224	-0.826113224
6	7.5	6.797885418	0.702114582
7	8	6.67805481	1.32194519
8	4	5.68655014	-1.68655014
9	6	6.467405319	-0.467405319
10	5	5.697419167	-0.697419167
11	6	5.68517065	0.31482935
12	6	6.25561142	-0.25561142
13	4	4.909896851	-0.909896851
14	4	4.650824547	-0.650824547
15	8	5.739133358	2.260866642
16	4	7.329878807	-3.329878807
17	4.5	6.506084919	-1.906085014
18	4	5.125533581	-1.125533581
19	2.5	4.829849243	-2.329849243
20	3	4.798352718	-1.798352718
21	6.5	5.994053841	0.505946159
22	4	4.662554264	-0.662554264
23	4	5.710925102	-1.710925102
24	3	4.976635933	-1.976635933
25	3	5.721735001	-2.721735001
26	3	4.740227222	-1.740227222
27	7	4.862075329	2.137924671
28	4	5.605093002	-1.605093002
29	5	6.591016769	-1.591016769
30	9	5.927323818	3.072676182
31	6	6.987300873	-0.987300873
32	3	5.413977623	-2.413977623
33	5.5	6.362308502	-0.862308502
34	7	6.890682697	0.109317303
35	5	6.555625439	-1.555625439
36	4	5.509035587	-1.509035587
37	6.5	6.193920135	0.306079865
38	4	5.216259956	-1.216259956
39	7	5.38255024	1.61744976
40	4.5	5.915582657	-1.415582657
41	6	6.307777405	-0.307777405
42	6	6.251922607	-0.251922607
43	8	6.132656574	1.867343426
44	3	5.044786453	-2.044786453
45	4.5	6.183454037	-1.683454037
46	5	5.977715492	-0.977715492
47	6	6.049937248	-0.049937248
48	6	5.416454792	0.583545208
49	9	7.61265564	1.38734436
50	7	6.441523075	0.558476925
51	6	5.611413479	0.388586521
52	6	4.949215889	1.050784111
53	7	5.530787945	1.469212055
54	3	5.16710186	-2.16710186
55	4	4.796158791	-0.796158791

Neural network output of Ca-SCP6-CC-final

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	4.553350449	-0.553350449
2	7	6.471146584	0.528853416
3	4	4.984083176	-0.984083176
4	2	3.176413536	-1.176413536
5	5	5.649323463	-0.649323463
6	4.5	4.608968258	-0.108968258
7	5	6.972485542	-1.972485542
8	3	2.563963413	0.436036587
9	8	6.853254795	1.146745205
10	5.5	5.538061142	-0.038061142
11	5	4.197401047	0.802598953
12	5	5.294016361	-0.294016361
13	6	6.131203175	-0.131203175
14	5	6.332873821	-1.332873821
15	7	7.198670864	-0.198670864
16	4	5.538061142	-1.538061142
17	8	6.853254795	1.146745205
18	6	5.904179573	0.095820427
19	8	8.611840248	-0.611840248
20	6	6.219276428	-0.219276428
21	9	8.992718697	0.007281303
22	6	6.065700054	-0.065700054
23	5	5.585037708	-0.585037708
24	4	5.435614586	-1.435614586
25	6	5.938158035	0.061841965

Neural network output of Ca-SCP6-CC-1

Case	Actual (A)	Network output (N)	Difference (A-N)
1	4	5.291267395	-1.291267395
2	7	5.604213715	1.395786285
3	4	6.381459236	-2.381459236
4	2	3.760285378	-1.760285378
5	5	6.605204105	-1.605204105
6	4.5	4.050289154	0.449710846
7	5	6.901521206	-1.901521206
8	3	4.350641727	-1.350641727
9	8	6.561705112	1.438294888
10	5.5	5.116605282	0.383394718
11	5	5.531777859	-0.531777859
12	5	5.204781055	-0.204781055
13	6	5.372631073	0.627368927
14	5	5.387399197	-0.387399197
15	7	7.097082138	-0.097082138
16	4	5.335483551	-1.335483551
17	8	5.872729778	2.127270222
18	6	6.907340527	-0.907340527
19	8	7.752534389	0.247465611
20	6	6.277563095	-0.277563095
21	9	7.835216045	1.164783955
22	6	6.241569519	-0.241569519
23	5	5.960596085	-0.960596085
24	4	5.577412605	-1.577412605
25	6	5.543209553	0.456790447

APPENDIX S

Data for establishing the relationships to explain the contribution of the causes to site coordination problems

Data for survey on contribution of causes to site coordination problems

Reply no.	Role	SCP1	SCP2	SCP3	SCP4	SCP5	SCP6	Cause1	Cause2	Cause3	Cause4	Cause5	Cause6	Cause7	Cause8	Cause9	Cause10	Cause11	Cause12
1	subcontractor	2.0	4.5	3.0	6.0	5.0	5.5	4.0	2.0	3.0	5.0	3.0	2.0	2.5	4.0	5.5	5.5	3.0	4.0
2	subcontractor	1.0	1.0	1.0	2.0	3.0	3.5	5.0	3.0	5.0	5.0	2.0	6.5	4.0	6.0	6.5	5.0	4.5	4.0
3	subcontractor	5.0	4.5	5.5	5.0	6.0	3.5	7.0	7.0	5.5	6.0	5.5	5.0	7.0	7.0	8.5	5.0	7.5	6.0
4	subcontractor	5.0	3.0	5.0	6.5	5.5	5.5	8.0	8.0	5.0	5.5	6.0	6.5	4.0	9.0	5.5	6.0	6.0	3.0
5	main contractor	4.5	5.0	3.0	3.0	4.0	4.5	4.0	4.0	2.0	2.0	2.0	3.0	2.5	5.0	5.0	4.0	5.5	3.0
6	subcontractor	5.5	5.0	6.0	5.0	4.0	5.5	8.0	8.0	5.0	4.0	2.0	5.0	6.0	8.0	8.5	4.0	7.0	5.5
7	subcontractor	5.5	5.5	5.0	5.0	6.0	5.5	8.0	3.0	5.0	2.0	4.0	6.5	6.0	8.0	8.5	5.0	5.5	7.0
8	subcontractor	5.0	2.5	4.0	6.0	5.0	7.0	6.0	7.0	7.5	6.0	6.5	6.5	7.0	5.0	7.5	5.0	4.0	7.0
9	subcontractor	5.0	5.0	6.0	5.0	6.0	4.5	7.0	6.5	5.5	7.0	7.0	5.0	6.5	8.5	8.5	6.0	6.5	4.0
10	subcontractor	5.0	3.0	4.5	5.0	4.5	4.5	7.0	7.0	8.0	4.0	5.0	7.0	7.0	5.0	9.5	7.0	5.0	6.0
11	main contractor	3.0	3.5	5.0	4.5	3.0	4.5	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0
12	subcontractor	6.0	4.0	5.5	6.0	4.0	5.5	8.0	7.0	8.0	7.0	5.0	6.0	6.0	9.0	8.5	7.0	5.5	7.0
13	subcontractor	5.0	4.5	5.0	6.0	5.0	3.5	7.0	5.5	6.0	6.0	7.5	7.0	4.0	5.0	6.5	7.0	7.0	5.0
14	subcontractor	3.0	5.0	5.5	6.0	3.0	3.5	5.0	5.0	8.0	7.0	5.0	7.0	3.0	6.0	8.5	4.0	5.0	6.0
15	subcontractor	6.0	4.0	5.0	6.5	6.0	4.5	6.0	6.0	4.5	6.5	7.0	7.0	6.0	6.0	9.0	7.0	5.5	7.0
16	subcontractor	5.0	4.0	4.0	6.0	5.0	5.5	7.0	6.5	7.0	6.0	5.5	5.5	7.0	9.0	8.5	6.0	6.0	7.0
17	subcontractor	3.0	5.0	5.0	6.0	6.0	6.0	7.0	5.5	6.5	7.0	6.0	5.5	5.0	7.0	7.5	7.5	6.0	6.0
18	subcontractor	5.0	5.5	3.5	7.5	5.5	6.5	6.0	5.0	6.0	7.0	4.0	6.0	7.0	5.0	8.5	5.0	5.5	6.0
19	subcontractor	5.0	3.5	5.0	7.0	4.0	7.0	6.0	7.0	7.0	5.0	6.5	7.0	4.0	6.0	7.5	5.0	6.0	5.5
20	subcontractor	5.0	4.0	5.5	6.0	6.0	5.5	7.0	7.0	7.5	5.5	6.0	7.0	6.0	6.0	8.0	7.0	5.0	4.0
21	subcontractor	5.5	5.0	4.0	6.0	5.0	4.5	8.0	7.0	7.5	5.0	6.0	6.5	4.0	6.0	8.5	5.0	6.0	7.0
22	subcontractor	6.0	5.0	5.0	6.0	5.0	5.5	7.0	6.5	7.0	7.0	5.0	4.5	6.0	7.5	7.5	7.0	4.0	6.0
23	subcontractor	5.0	3.5	4.5	5.0	5.5	4.5	8.0	4.0	6.0	5.5	6.0	6.5	7.0	8.0	8.0	6.0	6.0	7.0
24	subcontractor	5.5	5.0	5.0	6.0	5.0	6.0	6.0	6.0	6.0	5.5	7.5	6.0	7.0	7.0	5.5	7.0	7.5	6.0
25	subcontractor	6.0	5.0	4.0	6.5	4.0	5.5	7.5	7.0	4.0	6.0	6.0	7.5	7.0	8.0	7.5	6.0	5.0	6.0
26	subcontractor	5.0	5.0	5.0	5.5	4.0	5.5	7.5	5.5	8.0	6.0	6.0	7.0	5.5	7.0	5.5	7.0	7.0	4.0
27	subcontractor	5.0	5.5	4.5	8.0	6.0	5.5	8.0	7.0	6.0	6.0	5.5	6.0	7.0	8.5	7.5	6.0	6.5	7.0
28	subcontractor	5.0	4.0	4.5	5.5	5.5	5.0	7.0	4.0	7.0	7.0	6.5	4.5	6.0	5.0	6.5	7.0	5.0	6.0
29	subcontractor	4.5	4.0	4.0	6.0	6.0	5.5	6.0	5.0	6.0	7.0	6.5	4.5	5.5	8.0	6.5	6.0	6.0	5.5
30	subcontractor	5.0	5.5	5.0	7.0	6.5	5.5	6.0	6.0	6.0	5.5	7.0	5.5	4.0	6.0	7.5	6.0	7.0	5.0
31	subcontractor	5.0	5.0	4.5	7.0	6.5	4.5	6.0	6.0	6.0	7.0	5.0	5.5	6.0	8.0	8.5	5.0	6.0	6.0
32	subcontractor	6.0	5.5	5.0	6.0	5.0	6.0	7.5	5.0	7.0	6.5	6.0	7.0	7.0	6.0	7.5	6.0	5.0	5.0
33	subcontractor	4.0	4.5	4.5	5.0	5.0	5.5	8.0	7.0	6.5	5.0	6.0	4.5	7.5	8.0	6.5	3.0	4.0	5.0
34	main contractor	3.5	4.0	5.5	4.0	7.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	2.5	4.0	3.0	2.0
35	subcontractor	5.0	5.0	5.0	6.5	6.0	6.0	7.5	5.0	7.0	7.0	6.0	6.0	7.0	5.0	6.5	6.0	6.0	6.0
36	subcontractor	4.5	4.0	5.0	7.0	5.0	5.5	8.5	6.0	6.0	5.0	6.5	7.0	7.0	6.0	8.5	4.0	7.0	5.0
37	subcontractor	6.0	5.0	4.5	6.5	6.0	6.5	7.5	6.0	6.5	7.0	7.0	6.0	6.5	8.0	7.5	6.0	7.0	6.5
38	subcontractor	5.0	4.0	4.5	5.0	5.0	6.0	8.0	5.0	6.0	6.0	7.0	4.0	5.0	8.0	6.5	6.0	6.0	7.0
39	subcontractor	5.0	5.0	5.0	6.0	6.0	6.0	6.0	7.0	6.5	6.0	4.0	6.0	6.0	6.5	7.5	6.5	6.5	5.0
40	subcontractor	7.0	4.0	5.0	6.0	5.0	6.0	8.0	7.5	4.0	5.0	7.0	6.0	7.0	8.5	7.5	5.0	7.5	5.0
41	subcontractor	4.0	5.5	4.0	6.0	5.0	5.5	8.0	5.0	4.5	6.0	6.0	7.0	6.5	7.0	7.5	7.0	5.0	6.0
42	subcontractor	5.0	5.0	4.0	7.0	5.0	6.0	7.5	6.5	7.0	7.0	6.0	5.5	5.0	7.0	7.5	7.0	7.0	5.0
43	subcontractor	5.0	4.5	5.5	5.5	5.5	5.0	6.0	5.5	6.5	4.0	3.0	5.0	6.0	7.0	8.5	5.0	5.5	7.0
44	subcontractor	5.0	4.0	6.0	7.5	6.0	5.5	7.0	5.5	7.5	7.0	6.0	7.0	6.0	5.0	7.0	6.0	6.0	6.5
45	subcontractor	5.0	5.0	4.0	6.0	5.0	7.5	8.0	6.0	5.0	6.0	6.0	7.5	6.0	7.0	8.5	6.0	4.0	7.0
46	subcontractor	5.0	4.5	5.0	5.0	4.5	5.5	5.0	7.0	7.0	3.0	6.0	5.5	6.0	7.5	7.5	4.0	5.0	5.5
47	subcontractor	4.0	4.0	5.0	6.0	5.0	5.5	5.0	7.0	6.0	7.0	6.0	5.0	5.5	5.0	7.5	6.5	7.0	7.0
48	subcontractor	6.0	4.0	6.5	6.0	5.5	6.5	8.0	5.5	6.0	7.0	8.0	6.0	7.0	7.0	8.5	7.5	5.5	6.0
49	subcontractor	5.5	5.5	5.0	7.0	5.0	6.0	7.0	7.5	5.0	5.0	7.0	6.5	6.0	7.0	8.5	5.5	8.0	4.0
50	subcontractor	6.5	5.0	5.5	6.0	4.5	5.5	7.0	7.0	6.5	8.0	6.0	4.0	5.5	8.0	7.5	7.5	6.0	6.0

51	subcontractor	7.0	5.0	5.0	4.0	5.0	4.5	7.0	7.5	7.0	7.0	8.0	5.5	6.0	7.5	6.5	5.5	7.0	5.0
52	subcontractor	5.0	6.0	5.5	6.0	4.0	5.5	8.0	5.5	7.0	3.0	6.0	7.0	6.5	6.0	7.5	6.5	7.0	7.0
53	subcontractor	4.0	5.0	6.5	5.5	5.5	5.5	5.0	5.5	6.5	7.0	7.0	5.5	6.0	7.5	8.5	7.0	7.5	5.5
54	subcontractor	4.0	5.0	4.0	6.5	6.5	4.5	8.0	6.0	7.0	7.0	6.0	7.0	6.5	6.5	8.5	7.0	5.5	7.0
55	subcontractor	5.5	4.5	5.0	4.5	4.0	3.5	7.0	7.0	6.0	5.0	4.0	6.0	4.0	6.5	7.0	4.0	5.0	6.0
56	subcontractor	6.5	4.0	6.0	6.0	4.5	8.5	7.0	7.0	6.0	8.0	6.0	5.5	4.5	7.0	9.0	7.0	6.0	5.5
57	subcontractor	5.5	4.5	4.5	6.0	5.0	6.0	4.0	5.5	7.5	7.0	6.0	4.0	7.0	8.0	8.5	6.0	6.5	4.0
58	subcontractor	5.0	5.0	5.5	6.5	5.0	5.5	7.0	7.5	7.0	7.0	6.0	6.0	6.5	6.0	6.5	6.5	5.0	7.0
59	subcontractor	5.0	4.0	5.0	7.5	4.0	7.5	6.0	5.5	6.0	6.0	4.0	4.0	7.5	7.5	7.5	7.5	7.0	6.0
60	subcontractor	4.5	4.0	5.0	6.5	6.0	5.5	7.0	5.5	5.5	8.0	6.0	6.0	5.0	6.5	8.5	5.5	5.5	4.0
61	main contractor	5.0	5.5	4.5	4.0	4.0	6.0	5.0	5.0	3.5	4.0	4.0	5.0	3.0	4.0	4.0	6.0	4.0	4.0
62	subcontractor	5.0	5.0	5.0	6.5	5.0	7.0	8.0	5.0	5.0	6.0	4.0	6.0	7.5	8.0	7.5	5.0	5.0	6.0
63	subcontractor	5.0	4.0	5.5	6.5	5.0	7.0	8.0	7.0	6.5	5.0	5.5	6.5	7.0	8.0	7.5	6.5	7.0	7.0
64	subcontractor	5.0	5.0	3.0	4.0	7.0	6.0	6.0	6.0	7.0	6.0	6.0	5.5	7.5	7.0	8.5	5.5	6.0	6.0
65	subcontractor	4.5	5.5	4.0	5.5	5.0	6.5	8.0	7.0	5.5	6.0	6.0	6.5	5.0	8.0	8.5	6.0	6.5	5.0
66	consultant/property developer	7.0	7.0	5.5	4.0	5.0	5.0	9.0	9.0	8.0	9.0	9.0	6.0	6.0	7.0	8.0	8.0	5.0	3.0
67	subcontractor	5.0	5.0	2.5	5.5	3.0	7.5	9.0	7.0	5.0	5.0	7.0	3.0	5.0	4.0	8.5	7.0	5.0	5.0
68	main contractor	6.0	6.5	4.0	5.0	5.0	5.5	5.0	3.0	3.5	3.0	5.5	2.0	2.0	4.0	2.0	6.0	6.0	5.0
69	consultant/property developer	6.0	6.5	5.0	5.0	7.0	5.0	7.0	7.0	0.0	5.0	8.0	8.0	2.0	6.5	4.0	6.0	2.0	3.0
70	consultant/property developer	5.5	5.0	4.5	5.0	7.0	6.0	8.0	6.0	5.0	8.0	8.0	5.0	5.0	4.0	5.0	7.0	6.0	5.0
71	consultant/property developer	6.0	6.0	5.0	4.5	4.0	4.0	8.0	8.5	9.0	9.0	9.0	9.0	5.0	6.0	2.0	6.5	2.0	2.0
72	main contractor	8.0	8.5	7.0	8.0	9.0	7.5	6.0	6.0	9.0	9.0	9.0	2.0	5.0	5.0	7.0	8.0	8.0	1.0
73	subcontractor	3.0	3.5	3.0	4.5	2.0	4.0	6.0	5.5	4.0	5.0	3.0	1.0	2.0	3.0	3.5	8.0	4.0	2.0
74	main contractor	8.5	5.0	6.0	7.5	5.0	8.0	8.0	8.0	10.0	9.0	6.5	4.5	6.5	5.0	3.0	5.5	4.5	6.0
75	main contractor	5.5	6.0	6.0	6.0	6.5	4.0	6.0	6.0	6.0	6.0	6.0	2.0	2.0	3.0	3.0	4.0	4.0	4.5
76	consultant/property developer	7.0	7.0	8.0	5.5	6.0	7.0	10.0	10.0	10.0	10.0	10.0	3.0	3.0	6.0	5.0	6.0	5.0	5.0
77	main contractor	6.0	7.5	5.0	7.0	8.0	6.0	7.0	7.5	7.5	8.5	8.0	9.0	9.0	5.5	4.5	6.0	5.0	3.0
78	main contractor	4.0	4.5	4.0	4.0	5.5	5.0	5.0	5.0	5.0	5.0	5.0	8.0	9.0	3.0	2.0	3.0	2.0	2.0
79	main contractor	6.0	6.0	6.5	5.5	5.0	6.0	6.5	6.5	6.5	7.0	7.0	7.0	2.0	3.5	4.5	4.0	2.5	3.0
80	subcontractor	4.5	5.0	5.0	7.0	5.0	4.5	6.0	4.0	3.0	3.0	5.0	5.0	5.0	6.5	6.0	3.0	3.5	4.0
81	main contractor	7.0	7.0	5.5	8.0	4.0	6.0	5.0	5.0	6.0	4.5	8.0	2.0	2.0	3.0	2.0	3.0	2.0	2.0
82	subcontractor	7.0	7.5	8.5	8.0	7.0	7.5	7.0	6.0	6.0	8.0	7.0	7.0	6.0	7.0	7.5	6.5	8.5	7.5
83	main contractor	3.0	3.5	5.0	4.5	4.0	4.0	3.0	3.0	4.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0
84	consultant/property developer	4.0	4.5	5.0	2.0	3.0	4.0	7.0	7.0	6.0	7.5	7.0	6.5	6.0	4.5	2.0	4.0	6.0	8.0
85	subcontractor	4.0	4.0	1.0	5.0	4.0	7.5	4.0	3.0	3.5	4.0	4.0	3.5	5.0	6.0	6.5	5.0	5.5	2.0
86	main contractor	4.0	4.5	6.0	5.0	8.0	4.0	2.0	2.0	3.0	4.0	2.0	5.0	2.0	4.5	6.0	7.0	2.0	4.0
87	subcontractor	7.0	4.0	6.5	8.5	8.0	5.5	7.0	9.0	7.0	7.0	5.0	5.0	6.0	5.0	5.5	4.0	4.0	5.0
88	main contractor	4.5	5.0	6.0	6.0	6.0	8.0	2.0	1.0	3.0	2.0	4.0	2.0	2.0	2.0	1.0	5.0	1.0	2.0
89	main contractor	4.5	5.0	5.0	6.0	5.0	4.0	9.0	6.0	8.0	2.0	6.0	3.0	1.5	8.0	5.0	9.0	7.0	9.0
90	subcontractor	7.0	5.0	7.0	6.0	5.0	8.5	8.0	6.0	6.0	4.0	4.0	3.0	5.0	6.0	6.5	2.0	3.0	3.0
91	consultant/property developer	1.0	2.5	4.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	4.0	2.0	1.0	3.0	2.0	3.0	1.0	3.0
92	main contractor	6.0	6.5	7.0	5.0	4.0	4.6	9.5	8.0	10.0	9.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	4.0
93	main contractor	4.0	3.5	3.0	3.0	3.5	4.0	4.0	4.0	5.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	1.0	3.0
94	consultant/property developer	5.0	5.5	4.5	3.0	4.5	5.0	8.0	8.0	8.0	8.0	9.0	7.0	6.0	7.0	6.0	9.0	6.0	8.0
95	main contractor	4.0	4.0	4.5	6.0	3.0	2.5	2.0	2.0	3.0	2.0	1.0	2.0	3.0	3.0	3.0	6.0	2.0	5.0
96	consultant/property developer	4.5	3.5	6.0	6.0	4.0	5.0	8.0	6.5	5.0	7.0	8.5	7.5	5.0	3.0	2.0	4.0	2.0	5.0
97	subcontractor	6.0	5.0	8.0	6.0	5.0	6.0	8.0	7.0	5.0	6.0	5.0	4.0	2.0	7.0	10.0	6.0	6.0	9.0
98	subcontractor	5.0	5.0	5.5	6.0	5.5	7.0	8.0	7.0	6.0	6.0	6.0	6.0	4.0	8.0	8.5	5.0	7.0	8.0
99	main contractor	7.0	7.0	5.0	4.5	5.0	3.0	3.0	2.0	3.0	4.0	2.0	5.0	2.0	3.0	3.0	5.0	3.0	6.0
100	subcontractor	4.0	4.0	5.5	5.0	5.5	4.5	9.0	8.0	8.0	8.0	8.0	7.0	8.0	9.0	9.5	8.0	8.0	7.0
101	subcontractor	2.0	1.0	1.0	3.0	2.0	3.5	3.0	2.0	2.0	1.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	1.0
102	subcontractor	5.0	5.0	5.0	8.5	2.0	5.5	4.0	7.0	5.0	4.0	1.5	0.0	5.0	5.0	4.5	5.0	3.0	8.0
103	subcontractor	4.0	4.5	7.0	5.5	5.0	6.0	6.0	4.0	4.5	4.5	5.0	5.0	6.0	6.0	7.0	4.5	3.0	6.0

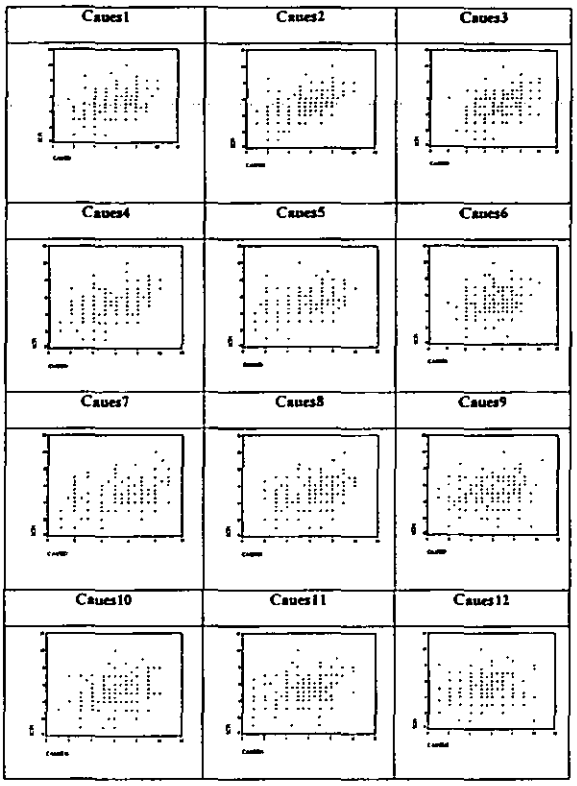
104	subcontractor	2.0	2.0	3.0	3.0	2.5	4.0	4.0	3.5	4.0	2.5	3.0	5.0	4.0	8.0	6.5	3.0	3.0	5.0
105	subcontractor	7.0	7.0	4.0	7.5	5.5	5.5	7.0	6.0	5.0	5.0	5.0	4.0	7.0	8.0	4.5	5.0	4.0	7.0
106	subcontractor	4.0	3.0	4.0	6.0	5.0	5.5	5.0	4.0	4.0	4.0	5.0	3.0	8.0	9.0	8.5	7.0	7.0	7.0
107	subcontractor	6.0	3.0	5.0	6.5	5.5	5.5	6.0	6.0	5.0	6.0	5.0	4.0	5.0	7.0	7.5	6.5	6.5	7.0
108	subcontractor	3.0	3.0	4.0	4.5	5.0	5.5	2.5	1.0	2.0	2.0	3.0	4.0	4.5	5.0	5.5	4.5	5.5	5.5
109	subcontractor	6.0	5.0	4.0	6.5	5.0	6.5	7.0	6.0	7.0	6.0	5.0	5.0	7.0	6.0	7.5	5.0	8.5	6.0
110	subcontractor	7.0	3.0	6.5	6.0	2.0	4.5	6.0	5.0	2.0	5.0	4.0	3.0	5.0	4.0	3.5	3.0	3.0	5.0
111	subcontractor	5.0	4.0	5.5	6.5	6.0	4.5	9.0	5.0	2.0	2.0	2.0	2.0	2.0	5.0	9.5	5.0	3.0	2.0
112	main contractor	8.0	9.0	8.0	8.5	5.0	6.5	8.0	10.0	7.0	10.0	8.0	5.0	9.0	7.0	8.0	10.0	9.0	6.0
113	subcontractor	7.0	7.0	8.0	7.5	7.0	7.5	7.0	6.5	7.5	5.0	6.0	6.5	6.0	6.0	9.0	7.0	6.0	6.5
114	main contractor	2.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	1.0	4.0	3.0	5.0	3.0	3.0	5.0	8.0	3.0	7.0
115	main contractor	6.0	5.5	5.0	5.0	3.0	4.0	7.5	6.0	3.0	8.0	8.0	8.0	5.0	8.5	8.5	9.0	7.0	9.0
116	main contractor	4.5	3.0	5.0	5.0	3.5	3.0	2.0	3.0	5.0	3.0	2.0	4.0	5.0	5.0	3.0	4.0	4.0	4.0
117	main contractor	5.5	5.0	5.0	6.0	4.5	3.0	4.0	7.0	5.0	7.0	9.0	7.0	5.0	7.0	4.0	9.0	7.0	4.0
118	subcontractor	3.0	4.0	4.5	5.0	5.0	1.5	8.0	1.0	3.0	3.0	7.0	7.0	2.0	8.0	4.5	8.0	1.0	9.0
119	consultant/property developer	3.0	2.0	2.0	3.0	4.5	4.5	2.0	2.0	3.0	1.0	1.0	2.0	3.0	3.0	2.0	3.0	2.0	4.0
120	main contractor	5.5	3.0	4.0	4.0	2.5	3.0	5.0	5.0	3.0	4.0	3.0	4.0	5.0	2.0	1.0	4.0	1.0	5.0
121	main contractor	5.5	4.5	3.0	3.0	6.0	7.0	1.5	3.0	3.0	5.0	5.0	2.0	2.0	4.0	5.0	7.0	4.5	4.0
122	consultant/property developer	7.0	8.0	9.0	6.5	6.5	7.0	8.0	8.0	7.0	8.0	8.0	8.0	8.0	9.5	8.0	9.0	9.0	8.0
123	main contractor	6.0	6.0	3.0	2.0	6.0	4.0	5.0	6.0	5.0	8.0	7.0	7.0	7.0	7.0	5.0	7.0	7.0	7.0
124	consultant/property developer	4.0	4.5	5.0	5.5	5.0	4.0	6.0	5.0	6.0	4.0	6.0	6.0	6.0	7.5	6.0	6.0	4.0	4.0
125	subcontractor	9.0	8.5	8.5	9.5	8.0	7.5	5.5	5.5	8.0	7.0	7.5	7.0	8.5	8.0	10.5	8.5	8.5	7.5
126	main contractor	5.5	4.0	4.0	6.0	6.0	5.0	7.5	6.5	7.5	9.0	8.5	7.0	7.5	8.0	6.0	7.0	5.0	6.0
127	consultant/property developer	4.0	5.0	6.0	4.0	4.0	8.0	5.0	5.0	6.0	4.0	5.0	8.0	7.0	6.5	2.0	2.0	2.0	6.0
128	consultant/property developer	6.0	7.0	8.0	5.0	5.5	6.0	4.0	4.0	7.0	4.0	4.0	7.0	8.0	9.0	9.0	6.0	7.0	9.0
129	main contractor	4.5	3.0	5.5	7.0	8.0	9.0	4.0	4.0	5.0	4.0	5.0	5.0	5.0	6.0	5.0	6.0	5.0	5.0
130	consultant/property developer	8.0	8.0	9.0	7.5	7.5	8.0	10.0	10.0	10.0	10.0	9.0	9.0	8.0	9.0	8.0	9.5	10.0	10.0
131	consultant/property developer	6.5	6.0	6.0	7.5	8.0	6.0	8.0	8.0	7.0	8.0	2.0	2.0	9.0	7.0	8.0	7.0	7.0	8.0
132	consultant/property developer	7.5	5.0	7.0	8.5	9.0	9.0	8.0	8.0	8.0	9.0	7.0	10.0	3.0	9.0	6.0	9.0	10.0	10.0
133	subcontractor	5.0	5.5	5.0	8.0	6.0	6.0	8.0	8.0	9.0	7.0	8.0	8.0	7.0	6.0	7.5	7.0	7.0	7.0
134	consultant/property developer	6.5	5.0	5.5	6.0	6.0	6.0	8.0	9.0	8.0	8.0	7.0	7.0	7.0	6.0	8.0	7.0	6.0	5.0
135	subcontractor	4.0	4.5	4.5	7.0	6.0	7.5	9.0	8.0	7.0	6.0	8.0	7.0	7.0	7.0	7.5	6.0	7.0	8.0
136	consultant/property developer	4.0	4.5	5.0	5.5	6.0	5.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	8.0	6.0	6.0
137	subcontractor	4.0	2.0	3.5	4.0	2.0	3.5	4.5	5.0	5.0	5.0	6.0	4.0	3.0	6.0	4.5	3.0	4.0	4.0
138	subcontractor	5.0	3.5	5.0	5.5	3.0	3.5	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	5.0	3.0	7.0
139	subcontractor	3.0	3.0	4.0	5.0	4.0	3.5	4.0	4.0	6.0	3.0	4.0	4.0	4.0	5.0	5.5	4.0	3.0	6.0
140	subcontractor	5.0	2.0	3.0	4.0	4.0	3.5	8.0	6.0	4.0	3.0	4.0	4.0	2.0	8.0	8.5	7.0	7.0	7.0
141	main contractor	4.0	5.0	6.0	8.0	4.5	6.0	4.0	3.0	8.0	4.0	8.0	6.0	2.0	3.0	5.0	4.0	3.0	9.0
142	subcontractor	3.5	3.0	3.0	6.0	5.0	4.0	3.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	5.5	3.0	3.0	1.0
143	subcontractor	8.0	4.0	7.0	8.0	7.0	8.5	10.0	8.0	9.0	7.0	7.0	8.0	8.0	9.0	8.5	6.0	7.0	6.0
144	subcontractor	5.0	4.0	5.0	7.0	4.0	4.5	4.0	2.0	4.0	5.0	4.0	3.0	6.0	7.0	6.5	5.5	7.5	6.0
145	subcontractor	5.0	6.0	5.0	8.0	8.0	6.5	4.0	5.0	6.0	7.0	6.0	6.0	5.0	8.0	7.5	6.5	6.5	5.0
146	subcontractor	3.0	1.0	5.0	3.5	6.5	6.5	6.0	2.0	5.0	2.0	2.0	2.0	8.0	3.0	3.5	1.0	2.0	2.0
147	subcontractor	6.5	8.0	8.0	9.5	6.0	8.5	5.0	4.5	5.0	5.5	6.0	7.0	8.5	10.0	6.5	5.0	5.5	7.0
148	subcontractor	7.5	7.0	8.0	8.5	9.0	7.5	6.0	5.0	8.0	4.0	9.0	5.0	5.0	7.0	8.5	7.5	4.0	5.0
149	subcontractor	4.0	2.0	4.5	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	4.5	3.0	2.0	2.0
150	subcontractor	5.0	5.0	5.0	5.0	2.0	5.5	6.0	5.0	2.0	5.0	5.0	2.0	2.0	6.0	3.5	5.0	5.0	5.0
151	main contractor	5.5	3.0	7.0	8.0	9.0	3.0	5.0	5.0	3.0	3.0	2.0	2.0	6.0	6.0	7.0	9.0	8.0	7.0
152	subcontractor	5.0	5.0	3.0	7.0	2.0	2.5	3.0	3.0	2.0	2.0	2.0	3.0	2.0	4.0	4.5	3.0	5.0	4.0
153	subcontractor	5.0	5.5	5.5	6.0	7.0	5.5	6.0	5.5	6.0	5.5	5.0	4.5	5.0	7.0	7.5	6.0	6.5	5.0
154	subcontractor	4.0	5.0	2.0	5.0	5.0	5.5	5.0	4.0	10.0	5.0	4.0	5.0	5.5	3.0	7.5	5.5	4.0	3.0
155	consultant/property developer	3.0	3.5	3.0	4.5	4.0	3.0	4.0	3.0	8.0	8.0	8.0	3.0	5.0	6.0	6.0	6.0	7.0	2.0
156	subcontractor	4.0	2.5	4.5	5.0	5.0	5.5	7.0	5.0	6.0	5.0	5.0	5.0	5.5	3.0	3.5	5.0	6.0	10.0

157	main contractor	8.0	8.0	5.5	6.0	7.0	5.5	9.0	9.0	8.0	9.0	9.0	8.0	5.0	6.0	5.0	6.0	5.0	4.0
158	main contractor	7.0	6.0	7.0	5.6	5.0	7.0	7.0	6.0	9.0	9.0	9.0	7.0	9.0	10.0	8.0	7.0	7.0	8.0
159	main contractor	5.5	6.0	6.5	7.0	6.5	5.0	7.0	7.0	8.0	8.0	8.0	7.0	8.0	9.0	8.0	8.0	7.0	8.0
160	main contractor	3.0	4.5	4.0	3.0	5.5	4.0	5.0	5.0	5.0	5.0	4.0	2.0	3.0	3.0	3.0	6.0	2.0	3.0
161	subcontractor	4.0	4.0	5.0	5.0	5.5	5.5	3.0	3.0	2.0	3.0	3.0	3.0	3.0	4.0	3.5	2.0	2.0	3.0
162	main contractor	7.0	7.0	7.5	8.0	8.0	6.5	8.0	7.0	5.0	7.0	6.0	4.0	9.0	9.5	6.0	8.0	8.0	4.0
163	main contractor	5.0	5.0	6.5	8.0	9.0	4.0	3.0	7.0	7.5	8.0	8.0	2.5	4.0	6.0	5.0	5.5	3.0	1.0
164	consultant/property developer	5.0	6.0	7.0	6.0	3.5	4.0	8.0	8.0	9.0	9.0	8.0	5.0	6.0	8.0	7.0	6.0	4.0	4.0
165	main contractor	10.0	6.0	7.0	8.5	5.5	7.0	7.0	8.0	6.0	7.0	5.0	5.0	8.0	9.0	7.0	6.0	5.0	5.0
166	subcontractor	8.0	8.0	9.0	9.0	7.0	8.5	9.0	7.0	8.0	8.0	7.0	7.0	8.0	9.0	8.5	9.0	7.0	6.0
167	main contractor	5.5	5.0	6.0	5.5	3.0	4.5	7.0	7.0	6.0	8.0	7.0	7.0	7.0	7.0	5.0	6.0	5.0	4.0
168	main contractor	6.0	6.5	6.0	5.0	5.0	6.0	7.0	8.0	8.0	6.0	5.0	6.0	9.0	10.0	9.0	9.0	7.0	5.0
169	subcontractor	3.0	3.0	3.0	4.0	4.5	7.0	5.5	5.5	5.0	4.5	5.0	6.0	5.0	5.5	6.5	4.5	5.0	5.5
170	subcontractor	4.5	3.0	4.5	5.0	6.0	5.5	5.0	5.0	5.0	7.0	7.0	7.0	8.0	4.0	4.5	3.0	4.0	6.0
171	main contractor	6.5	7.0	5.5	7.0	7.5	6.0	8.0	8.0	7.0	9.0	8.0	7.0	7.0	9.0	7.0	9.0	7.0	7.0
172	consultant/property developer	4.0	5.0	6.0	6.0	5.0	6.0	4.0	5.0	6.0	6.0	7.0	6.0	5.0	6.0	6.0	6.0	5.0	5.0
173	consultant/property developer	5.0	5.5	6.5	7.0	7.0	8.0	9.0	8.0	8.0	8.0	7.0	8.0	8.0	7.5	8.0	9.5	7.0	6.0
174	consultant/property developer	6.5	4.0	5.0	4.0	3.0	5.5	4.0	5.0	5.0	5.0	5.0	6.0	7.0	6.0	5.0	7.0	4.0	4.0
175	consultant/property developer	6.0	7.0	5.5	6.0	7.5	5.0	8.0	7.0	7.0	6.0	5.0	8.0	7.0	7.0	8.0	6.5	8.0	7.0
176	main contractor	5.0	5.0	7.0	7.5	7.0	8.0	5.0	7.0	7.0	6.0	6.0	5.0	8.0	9.0	8.0	10.0	10.0	8.0
177	main contractor	6.5	5.0	5.0	4.0	4.0	3.0	8.0	8.0	4.0	7.0	7.0	4.0	2.0	2.0	3.0	3.5	1.0	6.0
178	main contractor	3.0	4.5	5.0	5.0	5.5	4.5	2.0	2.0	5.0	8.0	8.0	2.0	2.0	3.5	3.0	9.0	3.0	8.0
179	main contractor	6.0	5.0	6.5	5.0	6.0	5.0	4.0	5.0	6.0	7.0	7.0	6.0	5.0	6.0	8.0	9.0	8.0	7.0
180	main contractor	6.0	6.0	6.5	5.0	6.0	6.0	7.0	5.0	3.0	7.0	7.0	3.0	5.0	6.0	5.0	8.0	7.0	7.0
181	subcontractor	5.0	5.0	5.0	5.0	6.0	4.5	6.0	4.0	6.0	7.0	7.0	5.0	4.0	4.0	9.5	8.0	7.0	5.0
182	subcontractor	4.5	4.0	4.0	6.0	4.0	3.5	6.0	4.0	6.0	7.0	6.0	6.0	5.0	8.0	7.5	3.0	5.0	8.0
183	subcontractor	8.5	8.5	9.0	9.0	7.0	7.5	3.0	2.0	4.0	4.0	2.0	4.0	5.0	5.0	8.5	7.0	7.0	8.0
184	main contractor	4.0	5.0	5.0	4.5	5.0	6.0	7.0	8.0	5.0	6.0	5.0	4.0	4.0	7.0	6.0	8.0	8.0	8.0
185	main contractor	4.0	5.0	5.5	5.0	8.0	9.0	7.0	5.0	9.0	3.0	5.0	7.0	4.0	5.0	2.5	7.5	1.0	9.0
186	subcontractor	4.5	2.0	2.0	7.0	6.0	4.5	5.0	2.0	3.0	4.0	2.0	1.0	6.0	6.0	3.5	4.0	8.0	9.0
187	subcontractor	3.0	3.0	4.0	4.0	4.0	3.5	6.0	4.0	6.0	5.0	3.0	3.0	6.0	7.0	8.5	6.0	7.0	7.0
188	subcontractor	3.0	4.0	2.0	6.0	5.5	4.5	3.0	2.0	3.0	4.0	6.0	6.0	7.0	7.0	7.5	7.0	6.0	7.0
189	main contractor	6.0	2.0	2.0	5.0	6.0	7.0	8.0	7.0	7.0	6.0	5.0	5.0	4.0	4.0	5.0	7.5	4.0	5.0
190	subcontractor	2.0	4.5	4.0	3.0	5.0	7.5	3.0	4.0	4.0	4.0	3.0	4.0	7.0	5.0	8.5	6.0	7.0	7.0
191	main contractor	4.0	4.0	5.0	4.5	5.5	6.0	4.0	5.0	4.0	4.0	5.0	4.0	7.0	8.0	6.0	7.0	7.0	9.0
192	main contractor	3.0	3.0	3.5	3.0	4.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	6.0	2.0	7.0	6.0	8.0
193	main contractor	7.0	7.0	6.0	5.5	5.0	7.0	10.0	10.0	7.0	10.0	7.0	5.0	3.0	5.0	7.0	6.5	5.0	8.0
194	subcontractor	1.0	2.0	2.5	2.5	3.5	4.5	4.0	2.0	4.0	4.0	4.0	2.0	2.0	7.0	9.5	6.0	7.0	10.0
195	main contractor	3.0	4.0	4.0	4.5	3.0	3.0	4.0	5.0	5.0	6.0	4.0	4.0	5.0	7.0	7.0	7.0	7.0	4.0
196	main contractor	3.0	3.0	4.5	5.0	5.0	4.0	5.0	7.0	4.0	6.0	5.0	3.0	4.0	7.5	7.0	7.0	8.0	5.0
197	subcontractor	7.0	1.0	3.0	6.0	4.5	7.5	4.0	3.0	2.0	2.0	3.0	6.0	6.0	4.0	7.5	6.0	4.0	7.0

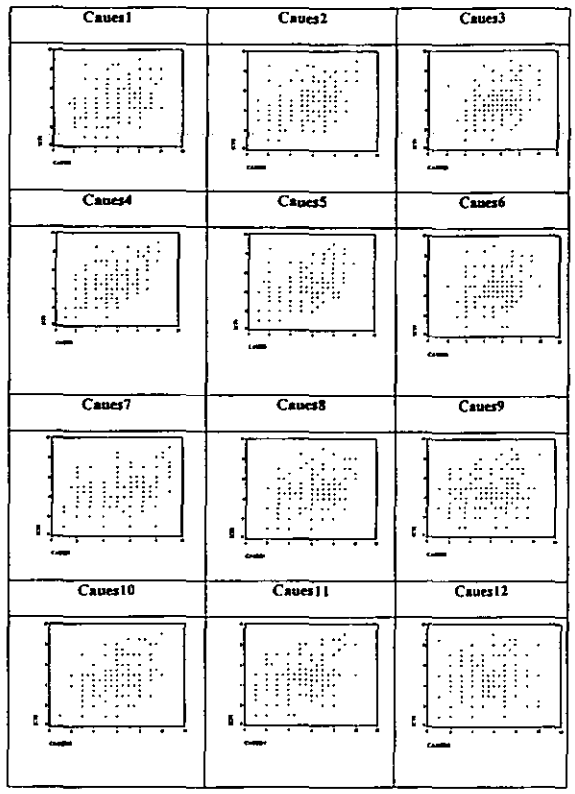
APPENDIX T

Scatterplot matrix for site coordination problems analysis

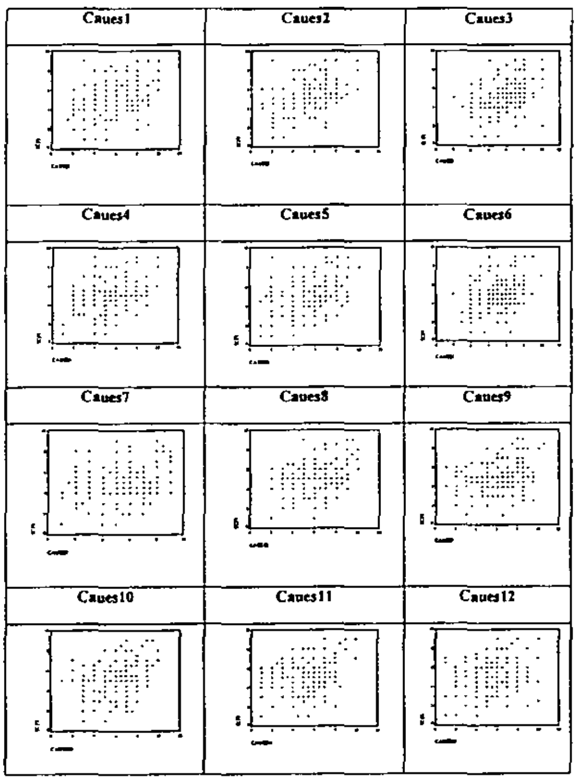
Scatterplot matrix for Ca-SCP1-AR model



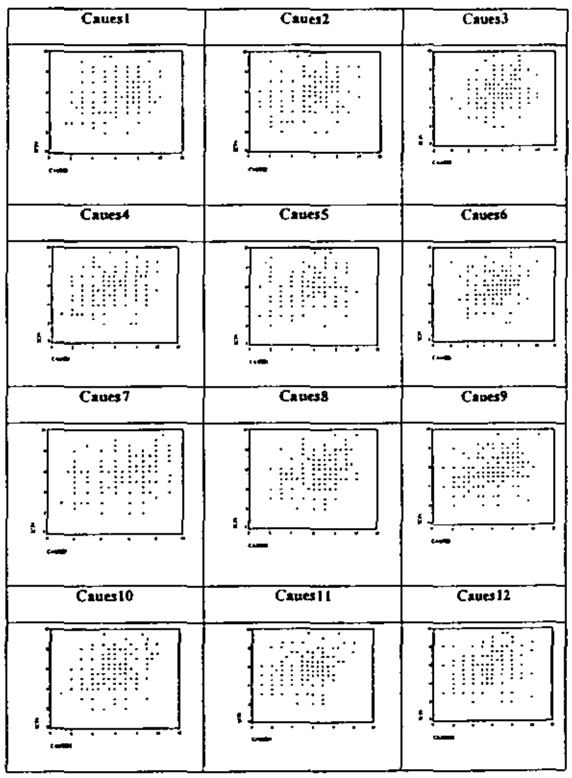
Scatterplot matrix for Ca-SCP2-AR model



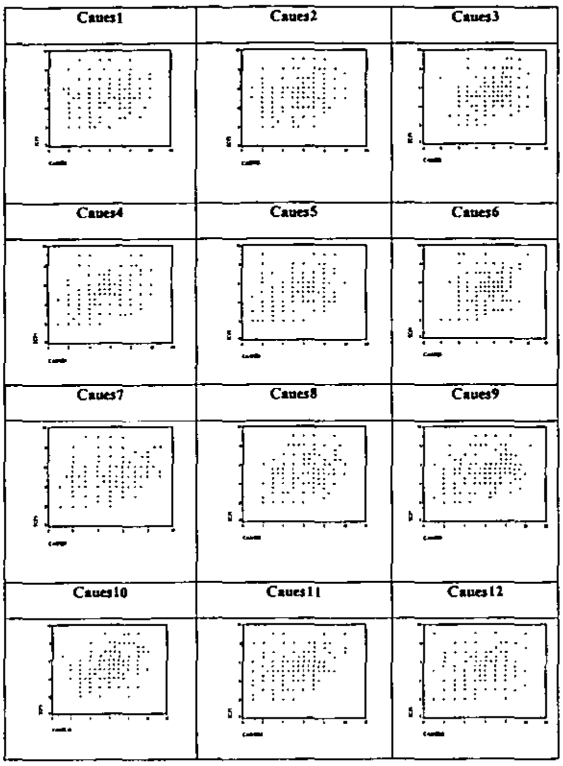
Scatterplot matrix for Ca-SCP3-AR model



Scatterplot matrix for Ca-SCP4-AR model



Scatterplot matrix for Ca-SCP5-AR model



Scatterplot matrix for Ca-SCP6-AR model