DEVELOPMENT OF A CLASSIFICATION MODEL IN DISABILITY SPORT

by

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ABSTRACT

The principal aim of this study was to develop a classification model in disability sports. Using disability swimming as an example, methods of participant observation, interview, survey and document analysis were undertaken in three empirical studies to develop and clarify the classification model and three elements in swimming classification- (a) the classification process, (b) classifiers and (c) the classification system.

First, the swimming classification process was identified as a social process. Members in the classification process socially interacted. The detailed classification process was described, interpreted and discussed. Several features in the classification process were identified. They included interaction among social actors, routinization, rules in the process, resources used by classifiers, power relations among social actors, allocation of rewards and sanctions in the classification process, and conflicts among social actors.

Second, the role of classifiers as an agent of social control in disability swimming was examined. Resources used by medical and technical classifiers in the classification process to maintain their role and social order, and the socialization of classifiers in swimming were specifically explored. In addition, the important characteristics of swimming classifiers were identified in the study.

Third, classification outcomes in disability swimming were monitored to evaluate the effectiveness of the classification system. Performance and impairment approaches were used in the study. Data of performances and types of impairment of Paralympic swimmers were analysed. The results revealed that the swimming classification system was generally fair but some classes needed to be fine-tuned.

In this study elements of the classification model were clarified by integration of the results of the three empirical studies and the classification literature. It is suggested that researchers may use the concepts of the classification model for further investigation in disability sport classification and disability sport committees may apply the model to systematically evaluate their own classification systems, processes and classifiers.

Key words: disability swimming, classification model, classification process, classifier, classification system, classification outcome, social process.

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LIST OF ABBREVIATIONS

Several terms are often used in this thesis. These terms are abbreviated as follows:

- BSC: British Swimming Championships
- CP: cerebral palsy
- CP-ISRA: Cerebral Palsy- International Sports and Recreation Association
- ESC: European Swimming Championships
- FN: fieldnotes
- ICC: International Coordinating Committee
- IN: interviewing notes
- IPC: International Paralympic Committee
- ISMWSF: International Stoke Mandeville Wheelchair Sports Federation
- ISOD: International Sports Organisation for the Disabled
- IWBF: International Wheelchair Basketball Federation
- MMT: manual muscle testing
- NWAA: National Wheelchair Athletic Association
- PG: Paralympic Games
- ROM: range of motion
- SAEC-SW: Sports Assembly Executive Committee for Swimming
- SCI: spinal cord injury
- TA: technical advisor
- TD: technical delegate
- WSC: World Swimming Championships

CHAPTER 1

INTRODUCTION

1.1 Disability Sport and Classification

The concept of sport as rehabilitation and therapy for people with spinal cord injuries (SCI) was advocated by Sir Ludwig Guttmann in the mid-1940s. The original model of sport for people with physical impairments was intended to foster the values of rehabilitation and recreation (Guttmann, 1976a). For Guttmann, sport played an essential part in the physical, psychological and social rehabilitation for people with impairments. In 1948 the first sport competition for people with SCI was held in Stoke Mandeville Hospital, England. Fourteen men and two women competed in the event. This was to be the beginning of the development of modern disability sport (Guttmann, 1976a, 1976b).

The Stoke Mandeville Games, as they came to be known, were successfully expanded to an international sport event in 1952, although competition was limited to athletes with SCI. In 1960, the Olympics for the disabled also known as the Paralympic Games were held in Rome, Italy. Four hundred athletes with SCI or poliomyelitis from 23 countries participated. These Games were the most important competition in the history of disability sport as they were the first Paralympic Games. Since that time, they have been held every four years. Paralympic Games represented the spirit of the disabled athletes and they have prompted the development of disability sport throughout the world (Guttmann, 1976b).

Since the 1980s, there have been several tremendous changes in disability sports. First, people with any types of physical impairments were allowed to compete in the 1984 and 1988 Paralympic Games (Steadward, 1996). Athletes with different types of physical impairments had access to the highest level of competition. Integration of all types of individuals with physical impairments in competitions became a major trend although individuals with different types of impairments still had their own separate events at the 1984 and 1988 Paralympic Games. Second, in the mid-1980s athletes with all types of physical impairments started to compete in the same events, beginning with wheelchair basketball (Craven, 1990; Strohkendl, 1986, 1996). Gradually, other sports such as swimming and table tennis used the same concept to integrate people with different types of physical impairments at the same events (Green, 1991; Strohkendl, 1989). Third, a large number of athletes were encouraged to participate at international level which has led to a dramatic improvement in the strength of competition (Sherrill, 1989). The most obvious example of this was seen when 4200 athletes from 62 countries participated in the 1988 Paralympic Games (Tiessen, 1997). This number was over 10 times that of the 1960 Paralympic Games.

When athletes with different types and severity of impairments compete in the same event, maintaining fair competition is a major problem. For example, athletes with cerebral palsy (CP) have problems in coordination and control of movements. They may be disadvantaged competing with athletes with SCI and amputations (Richter, Adams-Mushett, Ferrara, & McCann, 1992). Even competition between athletes with the same type of impairment produce different performances. For example, most athletes with SCI in cervical lesion perform movements and sport skills less well than athletes with SCI in thoracic and lumbar lesions. The solution to these problems has been the development of classification systems.

Sport classification systems have been seen in able-bodied sport for a long time. For example, gender is used to separate male and female events; chronological age is used to form different levels of competition; body weight is used to group athletes in boxing and other sports; and performance skills often separate amateur and professional competitions. These classification factors may reduce the disadvantages occurring with biological differences between athletes.

Modern disability sport relies heavily on similar forms of classification that ameliorate biological differences. Athletes with physical impairments not only are classified by the factors of gender, age, and body weight, but also they may be classified into specific groups or categories according to the type and the severity of their impairments. This type of classification is often called "medical classification" because it depends mainly on medical evaluations and the medical knowledge of classifiers (Bourke, 1994; Davis, 1994; McCann, 1984). Generally, four kinds of medical classification systems were used separately to classify athletes with spinal cord injuries (SCI), cerebral palsy (CP), amputations, and the general category of miscellaneous impairments termed "les autres". These impairment-specific classification systems were used predominantly from the 1950s to 1980s in most disability sports.

In addition, athletes may be categorised according to their functional abilities and athletic performance. Functional evaluations and sport-specific criteria are particularly emphasized in the classification process leading to this kind of classification being termed, "functional classification" (Bourke, 1994; Curtis, 1991; Hansen, 1994; Riding, 1994). In general, this form of classification has been used in disability sports during the 1990s.

Another kind of classification system, called "open classification", is also used in a few disability sports such as wheelchair tennis (Vanlandewijck & Chappel, 1996; Wu, 1998). Under this method of classification, athletes are not specifically grouped to different classes by classifiers who conduct detailed physical or functional evaluations. The main criterion to qualify disabled athletes who are eligible to compete is that the severity of their physical impairments needs to reach the minimal requirement.

These different classification factors and classification systems are all evident in disability sport. They make disability sport classification confusing and complicated. Furthermore, most classification systems used in specific sports have not been evaluated or examined which has left them open to many questions raised by athletes, coaches, researchers, or sport administrators who challenge the fairness of classification. Frequent questions are asked as follows. Should a medical classification system or functional classification system be used in disability sports (Sherrill, 1993a)? Should a medical or functional classification system be applied to all disability sports or should each sport have its own classification system (Bourke, 1994; Sherrill, 1993a)? What kinds of evaluations should be used (Richter, et. al., 1992)? Who should be classifiers (McCann, Davis, & Richter, 1994)? How does one evaluate the effectiveness of classification systems (Gehlsen & Karpuk, 1992; Higgs, Babstock, Buck, Parsons, & Brewer, 1990; Vanlandewijck & Chappel, 1996)? Should athletes with severe impairments be included in most disability sports (Sherrill, 1993b)? What are the minimal requirements for people with impairments to compete in disability sports (Biering-Sorensen, 1994; Vanlandewijck & Chappel, 1996)? These questions and many others have never been clearly articulated and examined.

Despite its importance, classification has not received much attention from researchers. The literature on this crucial topic is very limited with just over 100 articles available in published sources, not all of which are research studies. Research studies undertaken have focused on the older, impairment-specific classification systems and addressed three general classification topics. They are categorised as (a) classification system (e.g., McCann, 1979a, 1979b, 1991; Richter, 1994; Strohkendl, 1986, 1989, 1991); (b) classification process (e.g., Davis & Ferrara, 1996); and (c) classification outcomes (e.g., Brasile, 1986, 1990a; Brasile & Hedrick, 1996; Gehlsen & Karpuk, 1992; Higgs, et al., 1990; Vanlandewijck, Spaepen, & Lysens, 1994, 1995). However, these studies have not provided multiple and integrated perspectives. They omit sociological, historical, and political perspectives, they fail to clarify relevant research ideas and they do not address many classification issues. As a result, it is difficult to apply the results of these studies to actual classification practices and the construction of classification systems. Although disability sport has been developed over 50 years and classification has been a part of disability sport since its inception, classification research has been unsystematic, fragmented, and limited to specific sports or problems. Thus, a systematic approach needs to be developed and used to investigate complicated classification issues. In particular, a theoretical model that includes sociological concepts needs to be developed that can serve as a heuristic device for classification research.

1.1.1 Statement of the Problem

The main objective of this study is to develop a theoretical model of the classification process in disability sport. There are three sub-problems of this study: (a) to explore social interactions between classifiers and athletes in the classification process; (b) to identify characteristics of international classifiers and understand their roles in classification in order to understand the social control that classifiers exert in the classification process; and (c) to examine the classification outcomes in order to evaluate effectiveness of the classification system used in disability sport.

1.2 Theoretical Beginnings

Giddens (1979, 1984) constructed structuration theory to explain the complexities of social structure, social life, and social systems. Structuration theory addresses "the structuring of social relations across time and space, in virtue of the duality of structure" and "conditions governing the continuity or transformation of structures, and therefore the reproduction of system" (Giddens, 1979, p.66). Social structure is defined by Giddens as that "rules and resources, recursively implicated in the reproduction of social systems" (Giddens, 1984, p. 377). Structure only exists as properties of systems. Giddens explains the concept of social systems as reproducing relations between social actors and organizing regular social practices. According to Giddens,

> social systems are systems of social interaction. ... To study the structuration of a social system is to study the ways in which that system, via the application of generative rules and resources, and in the context of unintended outcomes, is produced and reproduced in interaction" (Giddens, 1979, p.66).

Social actors play their own roles in the social system. They have knowledge of how to do something or how to go on and recognize the appropriate performance in a social practice or range of practices (Cohen, 1987). Especially, Giddens refers to mutual knowledge of social agents in the interaction (Giddens, 1984). However, social practices and mutual knowledge may be dealt with as a series of rules (Cohen, 1987).

Rules are categorised by Giddens as constitutive and regulative rules. For example, "the rule defining checkmate in chess is ..." is a constitutive rule. But the example "it is a rule that all workers must clock in at 9.00 a.m." is a regulative rule. This regulative rule implies sanctions. However, Giddens rejects the distinction which is frequently made between constitutive and regulative rules because all social rules have both aspects. Social rules are "interpretations of activity as well as relating to specific sorts of activities" (Giddens, 1984, p. 21). These social rules are

> the core of "knowledgeability" which specifically characterizes human agents. As social actors, all human beings are highly "learned" in respect of knowledge which they possess, and apply, in the production and reproduction of day-to-day social encounters; the vast bulk of such knowledge is practical rather than theoretical in character (pp. 21-22).

Thus, we can understand that "rules generate - or are the medium of the production and reproduction of - practices" (Giddens, 1979, p. 67).

Resources, according to Giddens, constitute structures of domination and are drawn upon and reproduced as power relations in interaction. Often resources are used in social practices depending on rules and they can be distinguished as allocative and authoritative. Allocative resources are material resources involved in the generation of power and they generally derive from human dominion over *objects* or other material phenomena. On the other hand, authoritative resources are referred to capacities which generate command over *persons*. They are non-material resources. Utilisation of these kinds of resources by social agents can maintain their powers in the social system. In other words, social agents who can control resources have a transformative capacity and can dominate in social interaction (Cohen, 1987; Giddens, 1979, 1984). In Giddens's structuration theory, then, resources are used by social actors in the production, reproduction and/or transformation of social systems and social practices. Social structure (i.e., rules and resources) is the medium and outcome of the social practices.

This notion of resources provides a useful starting point for the examination of the classification as a social process. Social practices in disability sport classification produced by social actors can be thought of as classification interactions between athletes and classifiers and among the classifiers. Those interactions may be seen as some certain social processes. In addition, my previous classification experience and reviewing of relevant classification literature also contribute to the construction of the model. The theoretical model, therefore, is initially developed and it is presented in Figure 1.1. In this model, three main elements are included: resources, social practices and interactions, and social processes. These fundamental elements are divided into more sociological concepts. For example, several kinds of resources from the contexts of sport, medicine, politics, and so on, are used by classifiers to construct classification systems and to conduct classifications. Social practices in the classification process among the members of classification group are drawn simply as the interactions between an athlete and a classifier team and between classifiers in a classification team. The actual processes of interaction, however, are very complicated. Many sociological concepts are incorporated in the social processes. They include power relations, conflict, communication, social control, allocation of rewards and sanctions, and so on. The theoretical model, therefore, is a beginning for sociological research on the topic of classification. For the theoretical model to be useful for disability sport classification research, the sociological concepts and elements of the model need to be clarified and examined in the real classification situations. In addition, the relationships between elements in this model need to be identified. This requires that the model is grounded in the empirical world of disability sport.

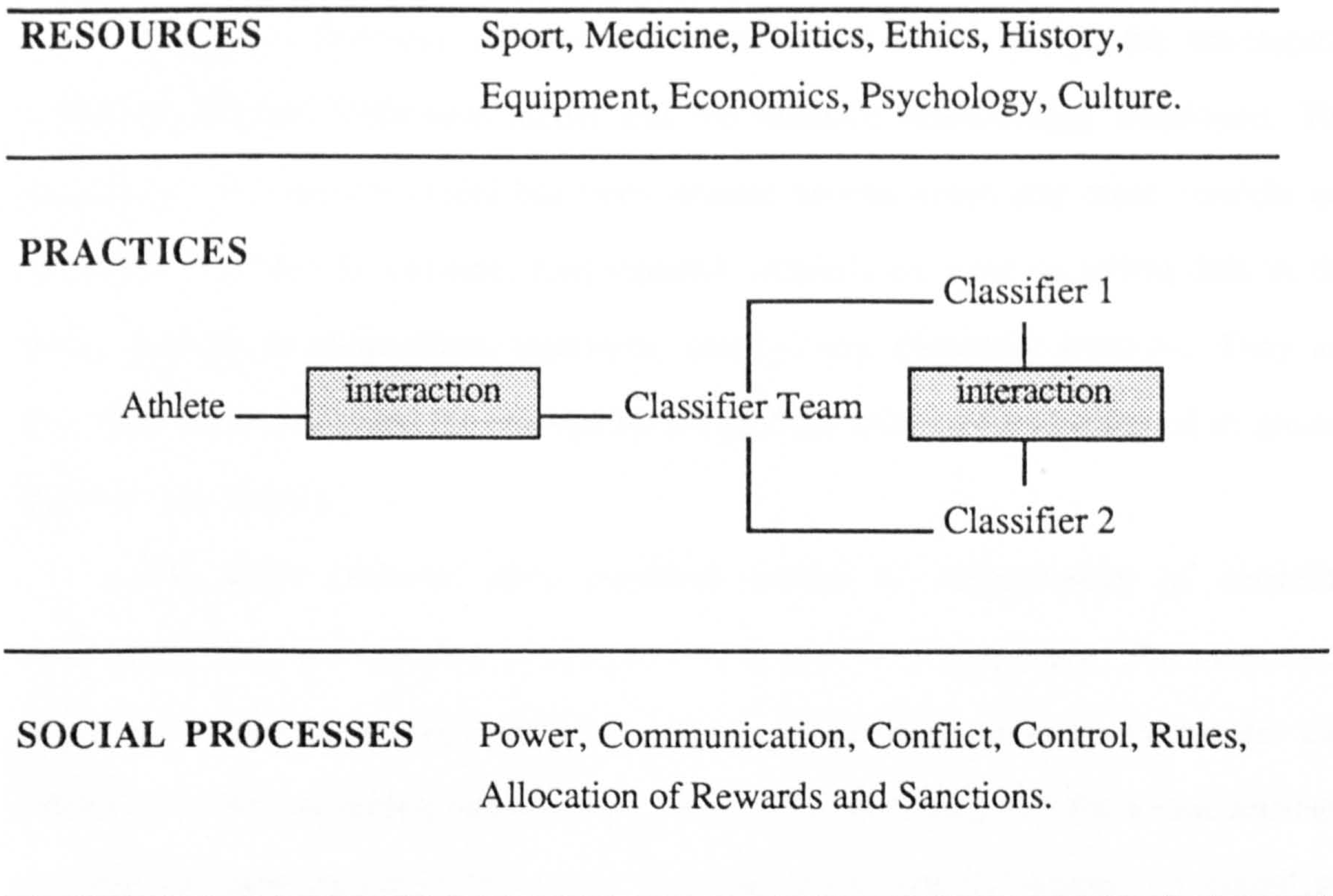


Figure 1.1 Theoretical Model for Disability Sport Classification

1.3 Structure of the Thesis

With respect to addressing the sub-problems of the study, this thesis is composed of eight chapters which are presented in the following way. Chapter 2 attempts to understand previous research in disability sport classification and to build classification concepts. The review of literature focuses on relevant classification research. It starts with a brief summary of the historical development and philosophy of disability sport and classification, followed by a more detailed exploration of the research on the classification system, classification process, classification outcome, classifiers, resources used in disability sport classification, and factors influencing the development, construction, and transformation of classification. Finally, controversial classification issues in disability sport are summarised and briefly discussed.

Chapter 3 discusses the theoretical framework of the study, the developing processes of the classification model and the research methodology employed. The theoretical classification model has been revised several times and these models are separately reported. In addition, four research methods are used to collect data in the study- participant observation, interview, survey, and document analysis. They are described individually and the reasons for using these methods are explained in greater detail in this chapter.

The thesis includes three empirical studies of classification in disability swimming. They are reported in Chapters 4, 5, and 6, respectively. The swimming classification process is explored in Chapter 4. Interactions between swimmers and classifiers in the swimming classification process are described, and the social settings, contexts and how the classification practices and system are constructed by classifiers and swimmers are interpreted. Several important characteristics of the swimming classification process are identified. In addition, social agents play a major role in the production, reproduction and transformation of their social systems (Giddens, 1984). In the case of swimming, classifiers are the main social agents in classification and they have powers to control the classification process. Thus, characteristics of international swimming classifiers and socialization of classifiers are reported in Chapter 5 in order to identify social control of classifiers in the swimming classification process. Specifically, medical and technical classifiers' demographic information and their classification knowledge are analysed and discussed. Resources used by medical and technical classifiers to learn classification and swimming knowledge are also presented in Chapter 5. Chapter 6 examines the performance outcomes of swimming classification to understand the effectiveness of the functional classification system. Data of performances and impairments of swimmers at the 1996 Paralympic Games were collected and analysed. Relationships between performances and swimming classes and relationships between performances and impairments are elaborated and discussed. The implications of studies of classification outcomes are also presented in this chapter.

A general discussion of changes of classification systems, the elements of the classification model and the relationships between elements is presented in Chapter 7. Concepts clarified in three empirical studies (Chapters 4 to 6) and previous literature (Chapter 2) are drawn together to illustrate the uses of the classification model in disability sport and establish the whole view in disability sport classification. In addition, the revised classification model is presented. And finally, Chapter 8 concludes the thesis by presenting a comprehensive view of the findings of classification studies, and offers some suggestions and implications for future classification research and for rule-makers to construct or revise classification systems in disability sport.

CHAPTER 2
REVIEW OF RELEVANT CLASSIFICATION LITERATURE

2.1 Introduction

This thesis is concerned with disability sport classification and investigates some classification problems. In particular, a classification model is developed to explore and explain the complexity of the classification process. As mentioned in Chapter 1, the reason for the scientific inquiry is because of the limited knowledge and unsystematic approach on the central topic. Although classification research started in the late 1970s and a few classification studies have been done especially in the last 15 years, these studies did not reduce the challenges that have been made by athletes, researchers and other people who are interested in this field over the issue of fairness of classification. To understand the previous research studies and their general background and identify the gaps of classification knowledge, there is a need to review the literature on classification.

The chapter is structured to overview the broad classification literature, to clarify relevant concepts of classification and to establish basic but limited classification knowledge. To begin with, the review discusses the purpose and rationale of disability sport classification and briefly describes the philosophy and historical development of disability sport classification. The review then examines classification research and concentrates on the classification system, process and outcomes, classifiers, and main resources used for the classification process, and factors influencing the construction and changes of classification. Finally, current controversial issues in disability sport classification are presented and arguments on those issues are discussed. However, classification in disability sports is a large and complex topic. Different types of impairments such as physical impairments, learning difficulties, visual impairments and hearing impairments have their own classification systems and processes, so this chapter focuses only on classification research for people with physical impairments.

2.2 Philosophy of Disability Sport Classification

Classification research has been grounded in practical problems but it has not been approached systematically (Cooper & Bedi, 1992). Although classification has been used in disability sports for several decades, its actual development was related to the practical needs of disability sports. However, literature that grasps the whole historical development of disability sport classification has been very limited. To begin with, there are some basic problems that need to be clarified so that researchers can clearly understand the general background of disability sport classification. For example, what is classification and what is disability sport classification? Why is classification needed? How is classification used and how does the system change? These basic concepts are reviewed and developed in this section. In addition, the practical and historical developments in disability sport classification are described and linked chronologically.

2.2.1 Purpose of Disability Sport Classification

There is consensus in the literature that the purpose of classification in disability sports is to ensure equitable and fair competition (e.g., Davis, 1994; Davis & Ferrara, 1996; McCann, 1979a, 1984; Riding, 1994; Shepherd, 1990; Sherrill, Adams-Mushett & Jones, 1986; Weiss & Curtis, 1986). There are several aspects to equity that have been mentioned by several researchers. McCann (1979a), for example, stated the purpose of classification for wheelchair athletes was to

> allow fair competition among athletes with great variation in level of lesion and degree of disability. It enables competitors with even the most severe disability to compete in a fair manner with other competitors with similar degrees of disability (p.6).

According to Strohkendl (1986) any classification system must provide *an equal opportunity* for athletes with impairments to compete at a national and international level. Davis (1994) explained the term "opportunity" in more detail to clarify the purpose of classification. Davis pointed out "the classification process should not contribute to the athlete's performance or successes" (p. 269). Equal opportunity is emphasized in the provision of an equal starting point for all competitors. It should be based on some scientific criteria to group athletes. Thus, any types of impairments of athletes should not be advantageous or disadvantageous in a fair competition.

In addition, Strohkendl (1996) claimed that classification should help to maintain the high standard of competition. The classification system should give everyone a fair chance to reach the highest level of competition. For Strohkendl, fairness and credibility of competition are all important in disability sports although these two concepts may not be achieved completely in disability sport at the same time. It is recognised that a classification system is a result of interaction and negotiation between these two concepts (Simon, 1991). Generally speaking, there are no perfect classification systems in disability sports but even so the development of classification to achieve the purpose of classification continues.

2.2.2 Rationale of Disability Sport Classification

Classification means "to divide things into groups or types so that things with similar characteristics are in the same group" (Collins Cobuild English dictionary, 1995, p. 287). Thus, when the definition of classification is applied to disability sports, it means that athletes are divided into groups so that athletes with similar characteristics, such as the same type of physical impairments, similar severity of physical impairments, similar functional abilities, can compete together. McCann (1984) defined classification in disability sports as

> an examination to determine the type and degree of physical impairment of the competitor, so that the competitor can then be placed in a group or class which will allow fair athletic competition with others who have similar levels of functions (p.167).

Richter (1994) claimed "the true purpose of classification should be to provide equitable starting point for competition, not for every individual, but for every class of athletes" (p. 255). In addition, McCann (1984) expressed the idea that "the final product of the classification efforts should ideally be sports performance ranges which relate fairly accurately within the classification groups" (p. 167). McCann's idea is that athletes in the same group (i.e., the same class) should have similar athletic performance.

In disability sport classification, then, athletes with similar characteristics are assigned to the same class. Athletes in each class are treated as similar to each other and they compete in the same event. For example, there are ten classes (i.e., S class) for swimmers with physical impairments to compete in freestyle, backstroke and butterfly events, and nine classes (i.e., SB class) in breaststroke events. The more severe the impairments and the poorer the functional ability, the lower the class. Although there are some diversities among swimmers in the same class, swimmers in each class are treated as similar to each other and they compete in the same event (SAEC-SW, 1998). On the other hand, in wheelchair basketball there are five classes but eight kinds of classification points (i.e., from 1 to 4.5 points). Players with the same classification points are considered to have similar functional abilities. At no time in a game can a team field five players with a total points value greater than 14. The five players of a team are treated as similar to those of another wheelchair basketball team (Courbariaux, 1996).

There have been two quite distinct interpretations of what is to count as a similar characteristic in disability sport system. The first has been an impairment-specific classification system. The impairment-specific classification system is also called the traditional, old, or medical classification system (Bourke, 1994). The rationale of the impairment-specific classification system focused mainly on the *impairment analyses* of athletes (DePauw & Gavron, 1995; Lindstrom, 1985; McCann 1991, 1994c; Vanlandewijck & Chappel, 1996). Generally speaking, classifiers (usually physicians or physiotherapists) evaluate athletes' physical functions and abilities to understand their medical diagnosis, impairment characteristics and levels of impairment (e.g., anatomical level in spinal cord injuries). Classifiers are more concerned with physical deficit of athletes and analyse test results in order to assign athletes to appropriate classes. For example, athletes with SCI are classified according to the medical diagnosis, strengths of some key muscles (e.g., results in manual muscle testing) and anatomical levels of impairment (McCann, 1979a, 1984). Residual limb length and position, however, are the main criteria used by classifiers for evaluating athletes with amputations (Sherrill, 1986). Using the impairment-specific classification systems, athletes who have similar diagnoses and degrees of physical impairments are assigned to the same class. Functional abilities and performances of athletes are not taken fully into account or considered at all by the medical evaluators in the classification process. In addition, observations of the athletes in competition is not a compulsory procedure in medical classification (Steadward, Nelson, & Wheeler, 1994).

The second interpretation has been a sport-specific classification system. The sport-specific classification system is also known as the functional system. It is developed by analysing the "sport" and "athletes' functions" (Curtis, 1991; DePauw & Gavron, 1995; Lindstrom, 1985; McCann, 1994b, 1994c; Sherrill, 1993b;

Vanlandewijck & Chappel, 1996). McCann (1994c) noted functional classification emphasizes the analysis of *movement behaviours* of athletes when classifiers observed athletes' performance. If athletes have similar movement patterns and functional abilities, they are categorised into the same class, despite the different types of physical impairments of athletes. The rationale of sport-specific classification focuses mainly on analysing the athletes' functions and comparing their functional profiles. The better the motor functions of athletes, the higher the class. Observation of movements and performances of athletes by medical and technical classifiers are very important procedures. With respect to the medical aspects such as analysis of impairments and medical diagnoses of athletes, they may not be the most important things when sport-specific classification systems are used to classify athletes. However, most disability sports have still kept some physical examinations in the classification process. In addition, some information such as age, training conditions, equipment used by athletes, also needs to be collected in most sports classification. Thus, the sport-specific classification system is a mixture of physical and functional evaluations (Bourke, 1994; Steadward, Nelson, & Wheeler, 1994).

In some sports, however, fairness and equality of competition can be achieved with an *open* classification. Open classification means that athletes do not need to be assigned to specific classes. In other words, there is only one class for all athletes to compete together no matter the severity of impairments of athletes. The main criterion for deciding athletes who are eligible to the sport is that athletes should reach *minimal requirements of impairments* (International Paralympic Committee, 1995). For example, open classification has been used in wheelchair tennis since 1992. If players have been medically diagnosed as having a mobility-related impairment and have substantial or total loss of function in one or more extremities, they are eligible to compete in wheelchair tennis (International Paralympic Committee, 1995). Using open classification, though, the standard of competition may be high. Indeed, it may be so high that athletes with severe degrees of impairments may be disadvantaged. For example, in wheelchair tennis players with tetraplegia are more disadvantaged than players with paraplegia because the former obviously cannot control a wheelchair as well, for instance, in terms of having good speed in pushing wheelchair and changing the direction of wheelchair. Furthermore, they may not be able to hold a tennis racket firmly to return the ball powerfully and smoothly. Gradually, players with tetraplegia or comparative severity of impairments may not play at international level because they always lose. Using open classification may discourage players with severe impairments to compete or may accelerate their retirement from wheelchair tennis competition.

2.2.3 Practical Development in Disability Sport Classification

Disability sport began with an emphasis on impairment. The first wheelchair sport competition in 1948 was only for people with SCI and no classification system was used. When the first International Stoke Mandeville Games were held in 1952, some classifications of athletes with SCI were used. The first classification system only categorised athletes using quadriplegia (tetraplegia) (i.e., C5-C8) or paraplegia (i.e., T1-S1), or into complete or incomplete lesions of SCI. Athletes with paraplegia may also be categorised into higher lesions or lower lesions of paraplegia. Although these general principles of classification were used, classification systems and contents were slightly different among sports. Table tennis players, for example, were classified as class A (i.e., tetraplegic class), class B (i.e., high lesions of paraplegia) and class C (i.e., lower lesions of paraplegia) (Guttmann, 1952).

Two classes, however, were used in wheelchair basketball. Athletes with complete lesions of SCI were classified into class A and athletes with incomplete lesions of SCI was classified into class B. Each class had one champion (Scruton, 1956). A few sports such as archery used open classification; that is, only one class was used. Using open classification, athletes did not need many detailed physical examinations before competing. In 1960, athletes with poliomyelitis were allowed to attend the ISMWSF Games and the Paralympic Games. At that time, they were assigned to the category of incomplete SCI.

As the number of athletes increased between 1948 and 1960, there was a concomitant increase in the diversity of impairments and as a result more demands were placed on the classification systems. Classification for athletes with SCI was revised slightly by the ISMWSF during the 1960s and in the early 1970s. In particular, the number of classes had been increased for athletes in order to improve the fairness of competition. For example, seven classes were used in athletics and eight classes were used in swimming at the ISMWSF and Paralympic Games (Guttmann, 1976b). The "anatomical level" of SCI was the main criterion used by classifiers to assign athletes to classes. Generally speaking, physicians (i.e., classifiers) carried out several physical examinations such as manual muscle testing (MMT) and neurological evaluations to decide the anatomical level of lesions of athletes. In addition, classes were transformed into points in some team sports (e.g., wheelchair basketball). Each team had a limitation on total points on court to balance the severe and mild impairments of players. Therefore, from the 1950s to the early 1980s classification for athletes with SCI (including spina bifida and poliomyelitis) used a medical and classifier-centred approach. This provided the basic approach and rationale for classification.

Between 1970 and 1984 major cleavages appeared in the application of the impairment-specific classification system. Problems with the ISMWSF classification system arose in a number of areas. First of all, in 1976 people with amputations were allowed to attend the Paralympic Games. At that time, it was realised that the ISMWSF classification system could not be used for athletes with other types of impairments. Therefore, it was necessary to develop another classification system to classify athletes with amputations. As a result, a classification system was developed by International Sports Organisation for the Disabled (ISOD) based on the residual length and position of amputated limbs of athletes. The original system for athletes with amputations used at the 1976 Paralympic Games had 12 classes and it had been changed to nine classes in 1980 (Guttmann, 1976b; Sherrill, 1986). The classification system for athletes with amputations was also an impairment-specific system and its general principle was applied to all sports although a few classes were reduced and events were combined in some sports.

Second, competitions for athletes with CP were introduced at the 1980 Paralympic Games. As a result, a specific classification system for athletes with CP was developed by Cerebral Palsy- International Sports and Recreation Association (CP-ISRA) in order to use it at the Paralympic Games. Athletes with CP were divided into four classes according to their coordination, types of cerebral palsy and functional abilities. However, only athletes with mild or moderate degrees of CP were allowed to attend the 1980 Paralympic Games. (i.e., only two higher classes) (Bolk, 1981; Sherrill, 1998). In 1982 the number of classes for athletes with CP were expanded to eight classes (Luder, 1982). These were four classes for wheelchair athletes and four classes for ambulatory athletes. Generally, a functional approach has been used in the classification process to classify athletes with CP (Sherrill, 1986, 1998).

Third, competitions for athletes with other types of physical impairments (i.e., les autres) were introduced to the Paralympic Games of 1984. A classification system for this category of athletes was also developed by ISOD. Generally, six classes were assigned for les autres athletes according to their functional abilities and performance. Although there were some basic criteria in each class to group athletes, classifiers mainly used a functional approach and partially used medical examinations to decide athletes' classes (Sherrill, 1986). Thus, athletes with all types of physical impairments (i.e., SCI, amputation, CP and les autres) have participated in the Paralympic Games and international competitions since 1984 and four kinds of impairment-specific systems have been adopted to classify athletes.

Fourth, the effectiveness of impairment-based classification was called into question by inequitable performances in wheelchair basketball (Craven, 1990; Strohkendl, 1986; Thiboutot, 1986). In the early 1980s, Strohkendl claimed the functional elements should be adapted in the classification process instead of just using the medical evaluations. For players, a functional approach in classification is easier to understand. Also, functional classification can reach a high validity of testing if the functional movements for evaluations have been examined carefully. Although medical people were suspicious of the objectivity of the proposed classification system, wheelchair basketball players strongly supported the functional classification because they believed the functional classification system for wheelchair basketball is fairer than the medical classification system. In addition, athletes with different types of physical impairments can be recruited to play wheelchair basketball together (Craven, 1990). The manifest diversity of the disabled population wanting to compete was clearly overwhelming the capacity of the impairment-specific systems. Disability sport had, moreover, grown beyond its therapeutic roots. The development and expansion of sport-specific classification systems was fueled by the success of wheelchair basketball (Vanlandewijck & Chappel, 1996).

Sport knowledge of athletes and coaches has contributed to the development of classification systems. Sport knowledge has become an unavoidable and important component in disability sport classification. Athletes and technical people (e.g., coaches) can participate actively in the development of classification and work with medical people to decide understandable classification systems. In particular, "observation of practice and competition" and "functional evaluations" were added and medical examinations were reduced to some extent in many sport classifications (Green, 1991, 1993; International Paralympic Committee, 1995; SAEC-SW, 1997, 1998; Strohkendl, 1986, 1989; Williamson, 1997).

The demise of impairment-specific systems accelerated with the Arnhem Seminar of 1987 (McCann, 1987; Steadward, 1996). At the Arnhem Seminar, there was consensus that each sport committee needed to develop its own sport-specific classification system. Gradually, sport-specific, integrated and functional classification replaced the traditional medical classification in the early 1990s. The most obvious manifestation of this was the widespread use of functional classification in many sports at the 1992 Paralympic Games. Most events used integrated classification systems. This idea of integration was well received by athletes and as a result the Games were dramatically successful (Sherrill, 1993b). At the 1996 Paralympic Games, more disability sports used sport-specific classification systems and many sport committees revised and improved the functional classification systems they had used in the 1992 Paralympic Games (International Paralympic Committee, 1995).

There are some vestiges of resistance, however, and proponents of the medical classification system have challenged these developments. Today, disability sport is flourishing with the dominance of sport-specific systems. The development of sport-specific systems has proceeded since 1992 (Richter et al., 1992). Some medical professionals in particular are still opposed to functional classification and they have argued that functional classification is supported by weak rationale and poor scientific evidence (McCann, 1994a, 1994b, 1994c; Richter, 1994). Those in opposition tried to persuade athletes to trust the traditional medical classification and they hoped to get athletes' support in order to use medical classification in disability sport again. So far they have been unsuccessful.

Throughout the long history of classification in disability sport, classification systems have rarely been supported by research. Many controversial issues about sport-specific and functional classifications were frequently presented in the early 1990s because there was a lack of research studies to support functional classifications. Most functional classifications, though, have been used for only a short time and according to Riding (1994), many sport-specific classifications are still in the stage of experimentation. Nevertheless and despite the irreversible trend of sport-specific classifications in disability sports, many of the controversial problems that have been presented need to be examined and clarified (McCann, et. al., 1994; Steadward, 1996). Current classification systems and processes may be thoroughly improved by systematic investigations, and future classification may then become more objective, understandable, scientific and acceptable. The work of Strohkendl in the player classification system for wheelchair basketball, however, is the exception in disability sports. It offers many excellent examples of the links between research and practice, between theory and praxis, and between development and performance (Strohkendl, 1986, 1991, 1996; Vanlandewijck & Chappel, 1996).

2.3 The Classification System

2.3.1 Impairment-Specific Classification System

The traditional classification system was a model of the impairment-specific and a medical approach. Members of the medical committee in the international disability sports organisations (most of whom are physicians) control the changes of classification systems, and medical classifiers have the authority to decide on the classes for athletes (Craven, 1990). Athletes must undergo detailed physical examinations in the classification process prior to competition. Generally, four kinds of impairment-specific classification systems have been used for athletes with SCI, CP, amputations and les autres.

The ISMWSF set up a classification system for people with SCI. In general, the ISMWSF classification was applied to all wheelchair sports; that is, athletes with SCI used the same class to compete in most wheelchair sports. This impairment-specific classification was categorized as seven classes (IA, IB, IC, II, III, IV and V). Athletes with tetraplegia were classified into Classes IA, IB or IC. Classes II, III, IV, and V were used for athletes with paraplegia. An athlete with SCI was assigned a class when physicians decided the anatomical level of lesion by examining the strength of key muscles at each neurological level (Guttmann, 1976b; Sherrill, 1993a). The higher the anatomical levels of lesions, the lower the class. Research on the ISMWSF classification system includes work by Coutts and Schutz (1988), Higgs et al. (1991), McCann (1979a, 1979b, 1985), Steadward (1978, 1979), Veeger, et al. (1991), Vorsteveld (1985), and Wicks et al. (1983).

For classifying athletes with CP, the CP-ISRA developed an eight-class classification system. Although the CP-ISRA was an impairment-specific organisation, the classification system focused more on the functional evaluations for athletes (CP-ISRA, 1990, 1993, 1997; Luder, 1982). The evaluation processes of classification included analysis of muscle tone, analysis of coordination and reactions and observation of athletes' demonstrations in activities such as running, swimming or throwing (CP-ISRA, 1990, 1993, 1997; Luder, 1982; Sherrill, Adams-Mushett & Jones, 1986, 1988a). Four wheelchair classes (from CP1 to CP4) and four ambulatory classes (from CP5 to CP8) were assigned for athletes with CP. In addition, detailed functional and medical profiles were described for each class to aid classifiers to assign athletes to classes appropriately. Research on this system, however, has been very limited and most articles relevant to CP-ISRA classification are very descriptive (Bolk, 1981; Luder, 1982; Kruimer, 1985, 1992b; Rains, 1992; Sherrill, Adams-Mushett, & Jones, 1986, 1988a).

The ISOD set up two kinds of classification systems for people with physical impairments (Biering-Sorensen, 1985a; ISOD, 1990; Sherrill, Adams-Mushett & Jones, 1986, 1988b). One was developed for people with amputations. Athletes with amputations were assigned to one of nine classes (from classes A1 to A9) according to the length of residual limbs, and position and side of amputated limbs. However, research on the ISOD classification system for individuals with amputations has been negligible and only a few researchers have described the classification system (Biering-Sorensen, 1985a, 1985b; Lindstrom, 1986; Sherrill, et. al., 1986).

Another classification system was developed for people with other types of physical impairments, except for people with SCI (including spina bifida and poliomyelitis), amputation (including dysmelia) and CP (including head injury). The other types of physical impairments include muscular dystrophy, dwarfism, arthritis, arthrogryosis, osteogenesis imperfecta, and brachial plexus injury. Generally, the more severe the degree of physical impairments, the lower the class. Due to the diversities of physical impairments, however, it was very difficult to set standard testing criteria in the classification system for any specific type of physical impairments and the system relied on functional evaluations to classify this group of athletes. Unfortunately, research for les autres athletes has been ignored by researchers although there have been a few descriptions of the classification system for les autres athletes and some brief discussion of the problems of the system (Biering-Sorensen, 1985a, 1985b; Sherrill, et. al., 1986, 1988b; Weiss & Curtis, 1986).

The impairment-specific, medical approach attempted to cope with diversity in a particular way and this is evident in these classification systems. Impairments are assumed to be "equivalent" in terms of performance with any one class. One of the assumptions of biomechanists, for example, is that people in the same class have similar biomechanical properties and movement patterns (Cooper, 1990). Physiologists maintained that individuals in the same class have similar physical fitness levels (Vanlandewijck & Chappel, 1996). The use of medical knowledge is to support and develop the impairment-specific classification systems. Research, then, has focused on the inner workings of the various classification systems and whether they achieved fairness in competition.

There are also some major problems with the system that stem from diversity. Even though there is some consistency in the number of medical classes for each impairment group, nevertheless many sports have their own interpretation of the system. While they attempted to adhere to the general principles, system developers produced more and more complexity as each sport attempted to interpret the general system to cope with the diversity among the athletes competing in its own particular context. As more practical problems arose with a specific system, so the tinkering produced more classes (e.g., splitting one class into two or more divisions) and further complexity resulted (Shepherd, 1990). There is an element, then, of sport-specificity even in the traditional impairment centred systems.

2.3.2 Sport-Specific Classification System

Attempts to combat diversity of impairments with sport-specific classification systems have met with some success. The achievements of wheelchair basketball, in particular, have been very impressive. The classification system in wheelchair basketball focuses mainly on functional evaluations, movement analyses of athletes, and partial determination of classes by athletes. Strohkendl (1986, 1991) claims that using functional classification allows athletes to participate in the classification process and athletes and coaches can easily understand the classification contents and processes. Thus, classification errors made by classifiers and classification cheating by athletes may be reduced (Craven, 1990).

Some sports started to use sport-specific classification systems at the 1992 Paralympic Games. Later, most sports used sport-specific classification systems at the 1996 Paralympic Games. For example, there were ten S, SB and SM classes respectively for swimmers with physical impairments at the 1992 and 1996 Paralympic Games. Swimming classifiers used a bench test, water test and observation of practice and competition to provide enough information on swimmers' functions and impairments to correctly classify swimmers (International Paralympic Committee, 1995; SAEC-SW, 1997a). In wheelchair basketball, players were assigned to one of eight classification points according to their arm, trunk and leg functions at the 1996 Paralympic Games. Trunk functions such as trunk balance, stability and mobility should be taken into consideration seriously in wheelchair basketball classification (International Paralympic Committee, 1995). Discussions between classifiers and players are important processes in deciding a player's class (Strohkendl, 1996). In wheelchair tennis, however, an open classification is used. The only limitation for athletes to attend the Games is that wheelchair tennis players "must be medically diagnosed as having a mobility-related disability" (International Paralympic Committee, 1995, p. 154). The above examples show that each sport committee decides its own classification system to meet its needs.

Since 1994, IPC has promoted the integration of all types of physical impairments of athletes in Paralympic Games and World Championships. This is an inevitable trend. Sport committees in the IPC were encouraged to develop integrated sport-specific classification systems (Riding, 1994). This sport-specific classification was firstly developed in wheelchair basketball, table tennis, swimming, fencing and winter sports (Coutts, 1991; Lindstrom, 1985; Riding, 1994; Strohkendl, 1989). According to the specific needs of each sport, it seems necessary that each sport committee develops its own classification system.

Each sport has its own classification system that has been developed according to some major and minor principles. The major principle of the current classification system is an emphasis on analysis of functional abilities of athletes. Functional abilities mean the capacities of athletes to perform basic movements and techniques in a specific sport. Thus, functional evaluations may be different within sports. For example, functional evaluations in swimming place emphasis upon evaluations of four basic swimming styles (i.e., freestyle, backstroke, butterfly and breaststroke), floating, turns and starts (SAEC-SW, 1998). However, functional evaluations in wheelchair rugby focus on the capacities of players in wheelchair maneuvers, passing, catching and holding a ball, and so on (IWRF, 1996). The analysis of the physical impairments of athletes is a minor principle but cannot be neglected in most disability sports. In other words, physical evaluations of athletes may still be an important classification procedure. The bench test in swimming classification, for example, is used to evaluate swimmers' physical abilities. Generally speaking, the current sport-specific classification focuses less on examining the athletes' physical losses and disabilities.

Many researchers have detailed the advantages of sport-specific classification systems (e.g., Hainey, 1994; Holland, 1994; Lindstrom, 1986; Riding, 1994). They include a significant reduction in classes and medals; enhancing the quality of events; events are seldom canceled due to insufficient numbers of athletes in a class and so athletes have more opportunities to attend competitions and win medals with more credibility. In other words, the status of disability sports is significantly increased. As a result, the media and the public may be more likely to be attracted by disability sports and outstanding athletes (Hansen, 1994).

The disadvantages of sport-specific classification systems, though, are not insignificant. Some researchers have criticized the functional classification system and highlighted several weaknesses and problems with the functional-based approach system (McCann, 1991, 1994a, 1994b, 1994c; Richter, et al., 1992; Richter, 1994). For example, how does a classification system integrate athletes with different types and severity of physical impairments so that they can compete together? At present, the scientific rationale of sport-specific classification system is still too weak to support it (McCann, 1994c). If classifiers depend mainly on observing movement behaviours of athletes, a few athletes may be misclassified, especially talented athletes and developing athletes. McCann argues that talented athletes may use some compensatory movements and perform sport techniques too well and then are assigned to higher classes. Developing athletes show poor functions and then are classified lower than they should be. This may show the instability and errors of the functional approach based as it is a subjective evaluation (McCann, 1991) - a feature McCann (1994c) has claimed should not be accepted in modern disability sport in the late twentieth century.

To date, the use of sport knowledge to support and develop the classification system would appear to be very important. This idea had not been emphasized when the medical classification system was used. Riding (1994) noted that the classification system should be understandable for athletes and coaches and the classification process should be more athlete-centred. Classifiers should listen to the opinions of athletes and technical people (e.g., coaches) and take them into account to develop and improve classification systems. After all, athletes are the main actors in disability sport and it seems reasonable that they should contribute to the development of future classification systems. However, this is an area of research that has been neglected.

2.3.3 Current Classification System

There is a strong case to be made that current classification systems meet the specific needs of sports because they are hybrids of the medical and functional systems. Medical classification systems and functional classification systems can often be found in different sports. For example, the classification systems of 17 formal sports and two demonstration sports at the 1996 Paralympic Games are shown in Table 2.1 (Davis, 1996; International Paralympic Committee, 1995). The medical classification and the functional classification are categorised separately in each sport. In addition, each sport may have a different number of classes and different classification procedures and processes to achieve its special needs and promote fair competition. Specifically, it can be found that contents and contexts of classification systems among sports are different. At the moment, it is almost impossible to apply the same classification system completely to all or most disability sports.

Currently, each sport committee and its classification subcommittee has had the power to decide the classification system it is going to use (Riding, 1994). This is a radical change from the older impairment oriented system that was controlled by medical committees. It seems that medical committees cannot control the classification subcommittee any more and they cannot just develop an impairment-specific system for one type of physical impairments of athletes, and then IPC and sport committees apply it to all sports.

Sport committees have to resolve a number of practical issues in deciding on their classification system. Perhaps the most important of these is integration. (Steadward, 1996). In particular, an important political question is often asked in disability sport "should every sport integrate athletes with every type of physical impairments or should each sport be limited only to athletes with a specific type of physical impairment"? For example, should only athletes with CP be allowed to compete in boccia or football in the future Paralympic Games? DePauw and Gavron (1995) noted that "integration" or "segregation" of different types of physical impairments in disability sports needs to be considered seriously because this issue will influence the future development and structure of disability sports and the future of classification systems.

There would appear to be some general principles that guide the development, articulation and implementation of current classification systems (Williamson, 1997). These include (a) the criteria for assigning athletes to a class; (b) the overall number of classes in a sport; (c) the strength and credibility of competitions; (d) scientific research to examine classification issues and evaluate classification systems; and (e) integration of different types of physical impairments. These general principles are interrelated and they will continuously guide the improvement of classification systems in the future. Any significant changes to current classification systems, however, need to be supported by systematic research studies. In addition, two important features of the developmental process of classification systems are the identification of the classification process and the evaluation of the chosen classification system. These important themes will be discussed in the next two sections.

Table 2.1 Classification Systems Used at the 1996 Paralympic Games

Sport	Medical Classification	Functional Classification
Archery	√	
Athletics	√	√
Basketball		√
Boccia		√ (CP system)
Cycling	√	
Equestrian		√
Fencing		√
Football		√ (CP system)
Goalball	√ (for visual impairment)	
Judo	√ (for visual impairment)	
Lawnbowls		√
Powerlifting		√ (weight)
Rugby	√	√
Shooting		√
Swimming	√	√
Table tennis	√	√
Tennis		√ (open)
Volleyball		√
Yachting	√	√

2.4 The Classification Process

In disability sports, classification is a continuous process. It begins from the time the athlete enters the evaluation area and interacts with classifiers to the time he or she is assigned a class. Sometimes it is even extended to the end of the protest evaluations. The classification process comprises a high degree of interaction between classifiers and athletes and is of variable duration. In addition, the classification process depends on many situations and special needs in different disability sports. However, there are very few studies that have investigated classification as a process in any depth. The first published article which mentioned the term "classification processes" was written by McCann (1985). As discussed previously, the ISMWSF and the medical classification system dominated disability sport at that time.

McCann (1985) simply discussed the classification process of wheelchair sport as an evaluation process. He noted that the medical classification process is

> designed to allow the medical examiner to focus on the potential neuromuscular performance rather than be excessively concerned about the skills and movements associated with the sport. However, there is need of a more refined sport-oriented type of testing in difficult or unusual cases (p. 94).

To achieve effective classification processes, using the ISMWSF classification system, McCann also suggested that fully qualified and knowledgeable examiners and ideal testing conditions in an unhurried environment are needed.

When functional classification systems have been used in several sports since 1990, McCann (1991, 1994c) argued that appropriate classification systems should have clear and scientific classification procedures. In McCann's view, the classification procedures are explained as classification processes. He believed that medical classification systems had clearer and more scientific evidence to support the validity of evaluation procedures, but most functional classification systems did not have objective and scientific evaluation procedures. He concluded that the medical evaluations should always be kept in disability sport classification. On the other hand, functional classification systems needed to be improved because of their subjective classification processes and unclear rationales. If the subjectivity of the functional classification system cannot be improved, according to McCann, then functional classification should be reduced as far as possible.

Strohkendl (1996) has used the idea of a classification process in disability sport. He reported that classification processes should be controlled by classifiers and athletes and complicated processes should be made as simple as possible. Athletes have rights to actively participate in and understand the classification process. Through communication and discussion between athletes and classifiers, classification results may be more understandable and fairer. Many conflicts between athletes and classifiers may be avoided and cheating in disability sport classification may be reduced. He demonstrated that the player classification system he invented for wheelchair basketball achieved the above criteria.

In addition, Davis and Ferrara (1996) described and explained the classification process used at the 1996 Paralympic Games from an administrative viewpoint. Classification processes can be separated into different administrative stages. Each stage should be handled properly by well-trained administrators. Davis and Ferrara also pointed out that the classification process was not complicated if it was arranged appropriately and organised in advance. They concluded that controlling the administrative part of classification is important if the programmes of the Games are to function correctly. The similar ideas of administration and "classification management" should be applied in other international disability sport competitions.

Recently, Williamson (1997) proposed several basic principles of classification used in disability sport. Specifically, he pointed out the evaluation process in disability sport classification is a "co-interaction" between athletes and classifiers and he then claimed the classification process as "assessment processes". This means that "the process of testing must demand respect for the dignity of participants and their reciprocal cooperation and trust for the interactive testing" (p. 47). Although Williamson sees the classification process as an interactive process, he does not examine it in great depth.

To summarise, the classification process in disability sport has been defined and explained differently. For McCann (1994c) the classification process is merely the sum of the classification procedures and the medical classification process is objective and reliable. But Strohkendl (1996) believes that athletes should participate actively in the classification process. The classification process is a communicative process between athletes and classifiers. Davis and Ferrara (1996) suggest that classification processes are important procedures for administration of the Paralympic Games. Williamson (1997) reported classification principles in disability sport and also noted that the classification process is an interactive process. Generally speaking, there is very limited knowledge developed in this research area and there are no studies that systematically clarify the classification process from different perspectives (Richter, Davis, & McCann, 1994). From a sociological perspective the interactions in the classification process between classifiers and athletes should be analysed and athletes' and classifiers' behaviours should be discussed and interpreted in greater depth. Thus, the classification process as a social process can be identified and understood clearly.

2.5 Outcome Analysis of Classification

With respect to the effectiveness and fairness of classification systems, the evaluation of classification outcomes is very important. DePauw (1988) has suggested that a number of research topics on sports for athletes with impairments should be studied in the future. Specifically, several topics are directly related to the outcome analyses of classification, such as (a) "physiological analyses of performance of elite disabled athletes by gender, age, disability, classification and event" (p. 296); (b) "biomechanical analysis of performance of elite disabled athletes by gender, age, disability, classification and event" (p. 296); and (c) "changes in classification as a result of training" (p. 294). There are a few articles that have examined the first and second ideas since DePauw's article was published. Unfortunately, no research undertaken has examined the latter idea.

This section focuses on reviewing research studies which have used sports science, performance, or impairment approaches to investigate the outcomes of classification. Specifically, the studies in classification outcomes examined the relationships between classes and physiological or biomechanical features of athletes (i.e., sports science approach), the relationships between classes and athletic performances (i.e., performance approach), and the relationships between types of impairments and athletic performances (i.e., impairment approach).

2.5.1 Sports Science Approach

There have been two kinds of sports science studies used to analyse the outcome of classification. One approach has been to examine the relationships between classes and sports techniques (e.g., biomechanical studies), and the other has examined the relationships between classes and physiological profiles (e.g., physiological studies). This section mainly presents the concepts of sport science used to examine outcomes of classification.

Researchers have tried to use biomechanical methods to investigate the issue of classification since the late 1970s (Steadward, 1978, 1979). Several studies have examined the biomechanical data of individuals with physical impairments (e.g., Steadward, 1978). Generally speaking, according to the purpose and rationale of disability sport classification, different classes of athletes should not perform similar sports techniques and movement patterns. If different classes of athletes have similar features of movement patterns and sports techniques, theoretically, some classes may be combined into the same class in order to reduce the number of classes. Thus, the fairness and credibility of competition can be maintained. Two kinds of biomechanical research studies (i.e., kinetics and kinematics) were often used to examine the above assumption (i.e., relationships between classes and sports techniques). Specifically, researchers tried to explain possible reasons which affect classification results and also identify relevant factors to understand their relationships especially in wheelchair sports (Cooper, 1990; Kruimer, 1992; Ridgway, Pope & Wilkerson, 1988; Sanderson & Sommer, 1985; Steadward, 1978; Vanlandewijck, Spaepen & Lysens, 1994, 1995).

In addition, since the early 1980s several articles have examined the relationships between classes and physiological profiles that include cardiopulmonary function, anaerobic power, and muscle strength. The basic theoretical assumption in the physiological approach is that the more severe the impairments (i.e., the lower classes), the lower the physiological capacities (Campbell, 1992; Veeger, Yahmed, van der Woude & Charpentier, 1991; Wicks, Oldridge, Cameron & Jones, 1983). Most physiological studies in disability sport classification, however, focused on examining athletes with SCI within the ISMWSF classification system. Campbell (1992) explains that athletes with severe impairments have lower physiological capacities than athletes with mild or moderate impairments because of the amount of muscle mass available for recruitment during exercise and the degree to which the sympathetic nervous system plays a role in determining the physiological capacities of people with SCI. Both neural and muscular factors influence athletes with severe degrees of SCI.

These biomechanical and physiological studies, however, did not completely explain the relationships between classes and sports techniques or between classes and physiological abilities. The studies could be problematic as they may involve small samples of subjects and different research methods. Furthermore, most studies analysed people with SCI but subjects in those studies had a variety of training conditions and lifestyles. Moreover, research studies often contained people of different ages and sex from different sports, and they used different testing devices and procedures. In addition, most athletes were classified by the old medical classification such as the ISMWSF classification system. Few studies analysed the outcomes of functional classifications using the sport science approach except a study undertaken by Vanlandewijck, Spaepen and Lysens (1995). Most researchers, therefore, cannot generalise the results of their studies to the larger population and all sports. Not surprisingly, those *objective* and *scientific* research studies, like the medical approach, have many limitations in explaining the outcomes of classification in disability sports (Strohkendl, 1996). DePauw and Gavron (1995) suggested that more studies should be done to clarify many of the factors that have not been found or have not been tested and also consider the limitations of the sport science approach.

2.5.2 Performance Approach

Analysis of performance outcomes is another approach that seeks to evaluate the effectiveness of classification systems. The basic theory of the performance approach of classification studies emphasized that different classes of athletes should have different athletic performances if a classification system is fair. However, if different classes of athletes have similar performances, researchers may conclude that the classification system is not effective so that a reduction or combination of number of classes may need to be considered (Higgs, et al., 1990). Although a few researchers have reported the relationships between classification and athletic performance in team sports such as wheelchair basketball and in individual sports such as athletics and swimming, there is a lack of systematic and longitudinal information documenting performance outcomes in different classification systems and disability sports.

2.5.2.1 Team Sports

The earliest research study which investigated performance outcomes in team sport was undertaken in the mid-1980s. Brasile (1986) assessed the relationship between classes of wheelchair basketball players and skill proficiency levels of athletes. Seven items were developed to evaluate the functional skills of players. They comprised a 20-m sprint, free-throw shooting, an obstacle dribble, baskets per minute, rebounding, speed pass and pass for accuracy. The classification system of the US National Wheelchair Basketball Association (NWBA) was used to classify players into classes I, II or III. Data were collected from 91 male players. The results of the study revealed nonsignificant differences within three classification groups in the scores of six test items. Brasile argued that the NWBA classification system may not provide fair and equitable competition to players in terms of the data from the study, but he explained that other factors such as age, years of experience, or type of wheelchair used, should also be considered and analysed because these factors may influence the skill proficiency levels of wheelchair basketball players.

Brasile (1990) later investigated more factors that influence the performance levels of wheelchair basketball players. Seven test items used to evaluate performance of players were similar to the old test items (Brasile, 1986). Data were collected from 79 players. They included players' classes, age, amount of time spent in practice, previous experience in wheelchair basketball, and skills performance. The results of the study indicated that not only classes of players may influence performance level, but also previous experience, age, and hours of practice may influence players' overall performance. Brasile suggested that more research was needed to determine the specific effects of these factors on performance and classification.

Vanlandewijck, Spaepen and Lysens (1995) analysed the relationships between classes and field performances in wheelchair basketball. The Comprehensive Basketball Grading System (CBGS) was developed and used to evaluate the field performances and functional abilities of athletes. The player classification system for wheelchair basketball was used to group 52 elite players into four classes. The results revealed that the CBGS scores in class I players were inferior to those in classes II, III and IV players, but the CBGS scores between classes II, III and IV players showed no significant differences. The authors concluded that reducing the number of classes to improve fair and equitable competitions in wheelchair basketball needed to be considered.

Recently, Brasile and Hedrick (1996) have evaluated the effectiveness of the international functional classification system for wheelchair basketball. They examined the relationships between skill performance levels of elite wheelchair basketball players and their classes. Thirty-one male players participated in the study. Ten items were included: a 20 Meter Sprint, the Pass for Accuracy (left and right hands), Spot Shot, 3 Point Shot, Full Speed Lay Up (left and right hands), Free Throws, and the Line Drill (left and right hands). The results revealed that class I appeared to score lowest on eight of the ten items but there were no significant differences among eight wheelchair basketball classes. The authors then tried to compress classification groups from eight to four classes and they found the skill levels in class I were statistically lower than classes II, III and IV. Finally, they reduced classes from eight to three and analysed the relationship between classes and skill performances again. They found that there were discernible trends between those three classes in terms of skill levels. Brasile and Hedrick concluded that it may be necessary to reevaluate the international wheelchair basketball classification system (i.e., the player classification system) and the numbers of classes with respect to skill performance criteria.

Although a few researchers have used the performance approach to examine the fairness of classification for wheelchair basketball, Strohkendl (1996) argued that some researchers (e.g., Brasile, 1986, 1990; Brasile & Hedrick, 1996; Vanlandewijck, Spaepen, & Lysens, 1995) may misinterpret or misunderstand the purpose of classification. Specifically, Strohkendl disagreed with any classification research and system that attempted to "quantify" impairments or functional abilities of people with physical impairments. He also disagreed with the position that only quantitative classification research was regarded as scientific, objective and useful. Strohkendl noted "the player classification system for wheelchair basketball is an ordinal scale that has developed through experience" (p. 53). Strohkendl, then, challenged strongly the quantitative studies of Brasile (1990), and Vanlandewijck, Spaepen and Lysens (1995) because they had not really proved the necessity or validity of reducing the number of classes. In particular, Strohkendl suggested that the International Wheelchair Basketball Federation (IWBF) needs to consider more factors before it uses the results of those research studies to change and revise the player classification system.

With regard to other team sports and their classification outcomes, there has been very little research that has examined the fairness of classification and effectiveness of classification systems using the performance approach. Generally speaking, the development of reliable and valid testing items for disability sports is a long and difficult process and so it is hard to evaluate adequately the performance of athletes. Yilla (1993), however, developed a battery of skill tests for quad rugby (i.e., wheelchair rugby) and reported the validity and reliability of the tests. The tests included maneuverability with the ball, pass for accuracy, picking, sprinting, and pass for distance. In the future, this kind of skill tests may be used to examine the relationships between classes and the field performances of wheelchair rugby players in order to evaluate the effectiveness of the wheelchair rugby classification system. In addition, Yilla's study perhaps provides a good starting point to encourage other team sports to develop their own sport-specific skill tests. Therefore, using the performance approach, more sport classification outcomes can be evaluated in the future.

2.5.2.2 Individual Sports

There have been a number of studies examining the performance outcomes in athletics and swimming classification. Coutts and Schutz (1988), for example, analysed the relationships between performance in wheelchair races and classes of athletes. The performance data were collected from the 1984 World Wheelchair Games. The ISMWSF classification system was used to classify wheelchair racers. The results revealed that speeds in all events for females were slower than those for males and the speeds in all events for athletes with tetraplegia were slower than those for athletes with paraplegia. However, there were no significant differences among paraplegic classes. According to the results, Coutts and Schutz concluded that some ISMWSF classes could be combined to achieve reasonable equality and fairness of competition in wheelchair racing.

Higgs and colleagues (1990) systematically investigated the relationships between classes and performance in track and field to evaluate the fairness of the ISMWSF classification system. The ISMWSF medical classification system was used to classify 904 athletes with SCI. The data were collected at the 1982 Pan American Games and the 1984, 1986 and 1987 International Stoke Mandeville Games. A total of 4698 performances were analysed in the study. The results revealed that athletic performance was not a good discriminator of medical classification, especially for paraplegic classes. With respect to the performance and medical classification, the data of the study supported a reduction in the number of the ISMWSF classes from 7 to 3 in track events and from 8 to 4 classes in throwing events.

Cooper and Bedi (1992) analysed the relationships between performances of wheelchair road racers and classes. Data of the top 10 finishers from 30 national sanctioned road races in the United States were collected. They included performance times and National Wheelchair Athletic Association (NWAA) classes. The results revealed that there was no difference among classes (from II to V) in performance in wheelchair road races. Although no performance differences could be attributed to the NWAA classification among the first 10 finishers in the wheelchair road races, the authors suggested that more subjects need to be recruited to avoid problems of low subject sizes in statistical analyses. This kind of research can then clearly identify the effectiveness of the NWAA classification system used in wheelchair racing.

McCann (1994a) used a medical approach to challenge the functional classification system in athletics. He used the performance results of javelin and track events at the 1984 and 1988 Paralympic Games to show the fairness of competition in those two Paralympic Games and also presented the results of athletics at the 1992

Paralympic Games to illustrate the weaknesses of the functional classification. Athletic performances in each ISMWSF class at these three competitions were described. The data revealed the athletes with SCI at C8 level (i.e., the old class IC) cannot be combined with athletes with SCI at T5 level (i.e., the old class II) for competition in the same wheelchair track class (i.e., the new T3 class). Athletes with SCI at C8 level had poorer performances than athletes with SCI at T5 level due to poor shoulder and hand functions in athletes with SCI at C8 level. McCann argued that a lot of athletes with cervical level SCI were apparently penalised by the functional classification system. This is significantly unfair and it may lead to athletes' dropping-out. However, those data in McCann's study only revealed the changing trend (i.e., mean values) of the performance of athletes in different classes. The data were not analysed and discussed in depth to distinguish the differences between classes. Also, the study did not report how many subjects were in the sample. Several weaknesses in the study have made the arguments unconvincing. The results and implications of the study need to be confirmed by further studies.

Compared to athletics, the effectiveness of swimming classification has received less attention from researchers. Gehlsen and Karpuk (1992) analysed the NWAA classification system in swimming. The performance records of freestyle, butterfly and backstroke in eight classes (i.e., from classes IA to VI) of both male and female swimmers from the 1981 to 1990 (except for the 1983) US National Games were collected and analysed. The results of the study revealed that tetraplegic classes had significant differences in swimming speeds in all events (e.g., IA was slower than IB and IC classes); there were significant differences in paraplegic classes for all events except the 50 and 100 meters backstroke. The results, however, cannot totally support the effectiveness and fairness of the NWAA medical classification, nor can they offer clear direction to combine swimming classes.

Hainey (1994) analysed the number of swimming events and the standard of the swimming competitions at the 1992 Paralympic Games. He compared the swimming results at the 1992 Paralympic Games with those at the 1988 Paralympic Games to identify the standard of competition. Hainey found the standard of swimming competitions at the former Games was better than that at the latter Paralympic Games. There were 5.8 swimming events per class at the 1992 Paralympic Games but the number of swimming events would be 1.8 per class if the impairment-specific classification systems had been used at the 1992 Paralympic Games. Hainey concluded that functional classification in swimming may reduce the combination of events, and increase the number and the strength of swimming events. This study implies that the functional classification system in swimming may improve the credibility of competition to some extent and also maintain the fairness of competition.

Research on performance outcomes may influence the revision of classification systems. A study by Higgs et al (1990) is perhaps the best illustration of this notion. Since the study was published, the classification system for athletics has been changed significantly. The number of classes for wheelchair track events, for example, were reduced from seven to four and as a result, the track and field events at the 1992 Paralympic Games were more competitive.

Although some performance outcomes have been examined, there are still a number of problems with those studies that have evaluated the functional classification system. For example, only athletics and swimming were analysed and most competition events (e.g., tetraplegic classes) did not have enough athletes to be examined (Coutts & Schutz, 1988). In addition, the traditional medically-oriented classification systems (e.g., the ISMWSF or the NWAA classification) were used to group athletes in most empirical studies. At the moment, only a few studies have analysed the relationships between classes and athletic performance by using the sport-specific and functional-oriented classification system in individual sports in order to understand the effectiveness of current classification systems. Therefore, the methods used in previous articles can be followed to examine the outcomes of the current sport-specific classifications with the performance approach.

2.5.3 Impairment Approach

To identify the domination of any type of impairment in a competition and to evaluate the effectiveness of classification systems, the impairment approach is another useful strategy to evaluate the classification outcomes. In particular, the impairment approach is used to examine the relationships between types of impairments and athletic performance. The rationale of the impairment approach is that if an integrated classification system is considered fair, the distributions of winning medals among impairments follow the similar distributions of impairments groups among the international competitors (Richter et. al, 1992). This impairment approach to research on classification outcomes is important but unfortunately there are only two empirical studies (i.e., one in wheelchair racing and the other in swimming) which have examined this issue and then only superficially.

Cooper and Bedi (1992) analysed the relationships between wheelchair road racers' performances and impairment aetiologies. In the study, the NWAA classification system was used to classify athletes. Performance times and impairment aetiologies of the first 10 finishers from 30 American sanctioned road races were collected. The results revealed that there was no significant difference between wheelchair racers with different types of physical impairments in the competition finishing orders. Although no performance differences could be attributed to impairment aetiologies among the first 10 finishers in the wheelchair road races, Cooper and Bedi suggested that more questions need to be investigated in future studies and more subjects need to be recruited in order to (a) avoid problems of low subject sizes in statistical analyses and (b) understand the domination of impairment in wheelchair road racing in greater depth.

Chappel (1994) examined the relationship between impairments and swimming performances at the 1992 Paralympic Games. He noted that swimmers with CP and SCI were underrepresented in the medal tables. On the other hand, swimmers with amputations, dysmelia, and les autres obviously dominated the competition for winning many medals and gold medals. However, there were two main problems in Chappel's study. First, he did not present the number of swimmers in detail. And second, he did not distinguish male and female swimmers. Chappel's study, however, provided a good idea for researchers to consider the type of impairments and the fairness of the integrated classification system.

It may be a more appropriate concept that performance and impairment approaches can be combined together to examine classification outcomes so that the classification system can be evaluated more thoroughly. Perhaps, data on athletes' classes, performance and impairment can be collected at the same competition and the combination of performance and impairment data may offer more information for researchers and classifiers to understand functional classification outcomes. Unfortunately, so far, no research studies have used the idea in actual competition and discussed results in depth.

2.6 The Classifier

Classifiers play an important role in disability sport classification no matter which system (impairment-specific or sport-specific) is used (Shepherd, 1990). Although everyone agrees that classifiers should do the classification jobs, the topic of classifiers has often been discussed and challenged (McCann, 1985; Richter, 1994; Shepherd, 1990; Sherrill, 1993). A few researchers have briefly presented the problems of classifiers. Generally, they can be categorised as (a) the qualifications of classifiers (medical or sport technical people), (b) training of classifiers and (c) reliability of classifier teams (McCann, 1994a, 1994b; McCann, Davis & Richter, 1994; Richter, Adams-Mushett, Ferrara & McCann, 1992; Sherrill, 1993; Steadward, 1996; Steadward, Nelson & Wheeler, 1994).

When the medical classification system has been used in disability sports, medical classifiers (e.g., physicians and physiotherapists) have dominated the classification process. McCann (1985) noted that medical people needed a good grounding in spinal injury and knowledge of sports to be a ISMWSF classifier. However, medical classifiers seldom used sport knowledge in classification or conducted evaluations that were related to sport skills. Craven (1990) and Thiboutot and Coutts (1990) have challenged this kind of medical-centred classification and also criticised the position of medical classifiers. They claimed that the purpose of classification is for competition and it is not the patient's diagnosis or treatment in the hospital. Therefore, they have suggested that the medical evaluations should be reduced as far as possible. In addition, Craven (1990) argued that classifiers always overlooked athletes who lay down on the bench for medical classification. This is an unequal status between classifiers and athletes and most athletes hope to avoid being treated in this way (Craven, 1990). Craven also stated that medical classifiers seldom understand sports and he questions whether they can correctly classify athletes and connect athletic performance with their physical abilities. Further to this, he argued, if athletes with all types of physical impairments were integrated in the same competition, how can medical classifiers understand the many types and characteristics of impairments and collect sufficient data in the classification process so that how they could correctly do appropriate physical evaluations?

When the functional classification system has been used in disability sports in the last ten years, technical classifiers have had more power to assign athletes to classes according to athletes' functional profiles and movement behaviours. However, some medical people challenged this on the basis that if technical classifiers only observed movements and skills of athletes and then analysed them subjectively, but they did not understand impairments or have enough medical knowledge, then how could they connect the impairments and real functions (Richter, et al., 1992; McCann, 1991, 1994b, 1994c)? Using only observations of athletes' movements to group athletes may produce two major problems: (a) talented athletes may be penalised by being placed in higher classes because of good performance or compensatory skills, and (b) developing athletes may be misclassified into lower classes because of poor skills and poor performance (McCann, 1991, 1992, 1994a; Vanlandewijck & Chappel, 1996; Weiss & Curtis, 1986). Unless technical classifiers have sufficient medical knowledge, they may consider more physical factors in classification and connect functional abilities and impairments of athletes. Otherwise, the functional classification conducted by technical people may be arbitrary (McCann, 1994c). Steadward (1996) did not support the medical-oriented classification system in the current Paralympic movement. However, he has argued that training sport-specific classifiers could be very expensive because the observations of athletes' movements need the time, energy, a lot of actual experience and mutual discussions among classifiers and with athletes. Steadward also reported that if technical people have a background in disability sport and biomechanics and they are properly trained, they should understand and use the functional classification well. In disability sport classification technical classifiers may be needed more than those medical classifiers who do not understand or participate in sports (Craven, 1990; Strohkendl, 1991).

A few articles have reported conflicts between medical and technical classifiers (Craven, 1990; McCann, 1994c; Strohkendl, 1996). Curtis (1991), however, noted that if medical and technical people work together to become a classification team, each person can share his or her viewpoints. Therefore, medical and technical viewpoints in classification could be integrated to assign the athlete to an appropriate class. Perhaps the errors of classification results may be reduced. In addition, medical classifiers can acquire sports technical knowledge from technical classifiers. On the other hand, technical classifiers can also acquire medical knowledge, characteristics of impairments and physical evaluations from medical classifiers. Gradually, conflicts between medical and technical people may be reduced. Thus, McCann, Davis and Richter (1994) suggested that "a classifier team approach, including those with medical and those with sports technical experts to do classification, was the best choice for most sports" (p. 317).

In summary, classifiers have been recognised as important and their roles in disability sport cannot be ignored. However, several problems relevant to classifiers have not been examined in any depth. Although currently medical and technical people have worked together for classification in some sports such as swimming and wheelchair basketball, there are no empirical studies that identify the problems and also discuss power relations and social control between athletes and classifiers in the classification process. For better understanding of classifiers, the above important issues need to be examined in greater detail.

2.7 Resources Used in Disability Sport Classification

Resources used by classifiers in the classification process have been mentioned briefly in some of the literature. However, this topic, like other research topics in classification, has not been systematically discussed. Although resources may be used to conduct classification and establish classification systems, the final outcome will be that different sport committees decide the reasonable classification processes and develop different kinds of classification systems to meet the specific needs of their sports (Riding, 1994). In this section, two important resources- medical and sport knowledge- will be reviewed and explained separately. The discussion will focus on how these resources are used in the classification process and how their use influences classification.

2.7.1 Medical Knowledge

Medical knowledge has been an important and useful resource for rule-makers to develop classification systems since the inception of disability sport classification (Guttmann, 1976b). Classifiers need some medical knowledge to help them to understand the characteristics of impairments and to measure the impairments of athletes in medical classification systems (McCann, 1991, 1994a, 1994c). Such knowledge includes neurological, musculo-skeletal and biomechanic knowledge (McCann, 1994c). It is a basic, useful and scientific tool to help classifiers to achieve impairment assessment of athletes.

Impairment assessment fuses many medical and therapeutic ideas. Because different types of physical impairments may stem from different characteristics, the complexity of impairments naturally makes impairment assessment of athletes become important and difficult. In other words, the "characteristics of impairments" of athletes need to be understood and evaluated and they include aetiologies of impairments (i.e., medical diagnosis); clinical symptoms and pictures of impairments; and physical abilities and limitations of people (International Paralympic Committee, 1995). For example, motor function in limbs and trunk is mainly affected in people with SCI, poliomyelitis and amputations; and poor reactions and coordination of movements are often observed in athletes with CP and head injuries. Consequently, other symptoms and relevant physical factors should be analysed. These include abnormal muscle tone, stiffness in joints, deformities of limbs or spine, and abnormal sensations. These problems may appear in athletes with specific types of impairments and may affect athletic performance (Weiss & Curtis, 1986). Old impairment-specific classification systems put the emphasis on using medical information, evaluations and principles as their classification criteria (Sherrill, 1986). To date, a lot of medical terms and information can still be found in the current classification manuals and used in the classification process (International Paralympic Committee, 1995). It is assumed that classifiers have enough medical knowledge and practical experience to evaluate the physical abilities of athletes clearly and correctly.

Classifiers not only need to understand the characteristics of impairments, but also need to know how to measure and analyse impairments (McCann, 1991). The traditional physical examinations are always used to evaluate patients' functions and abilities in hospital. However, these examinations are also used to measure levels of impairments of athletes in some sport fields. Generally speaking, manual muscle testing (MMT) is used to evaluate the muscular strength of athletes to confirm residual functions and anatomical levels of lesions; measurement of range of motion (ROM) of joints is used to evaluate joint's mobility of athletes; and measurement of the length of residual limbs is used to present possible motor functions of athletes with an amputation or dysmelia (International Paralympic Committee, 1995). McCann (1991) noted that these physical examinations have good reliability and validity in the evaluation of an athletes' impairments. In addition, he reported that quantitative data recorded in the classification sheet can show the objectivity of the test results (McCann, 1994c). However, physical evaluations for athletes with CP have been modified in terms of measuring functional and sport abilities including movement coordination and muscle tone (Cerebral Palsy International Sports and Recreation Association, 1997; Mushett, Kreuter, & Seidler, 1992). The evaluations used in the sport classification of people with CP, however, have seldom been used in clinics or hospitals. As a result, the validity and reliability of tests have been viewed with some suspicion by researchers (Richter, et al., 1992).

The use of medical knowledge is not without its problems (Thiboutot & Curtis, 1990; Strohkendl, 1996). First, the physical evaluations may be too rigid to evaluate athletes with different types of physical impairments correctly. Due to diversities of characteristics of impairments, physical evaluations are not efficient in distinguishing athletes with unusual profiles of impairments and physical abilities. Second, many factors may not be measured and analysed in medical classification. This indicates that physical examinations in disability sports are not really practical for athletes with all types of physical impairments. If many factors such as muscle strength, mobility of joints, and coordination are all measured objectively, the classification process would take a long time. Deciding a class for an athlete will become more difficult. Third, for most athletes, medical knowledge may be too difficult and complicated to understand. Many athletes hope that they can know how they are evaluated and they want to participate in discussions in the classification process (Craven, 1990). Using medical classification, however, the classification process may be dominated by medical people because only they have *expert* knowledge. And fourth, numerical data recorded in the medical evaluation does not necessary make such evaluation "objective" (Strohkendl, 1991, 1996).

The use of physical evaluations and medical knowledge in classification, on the other hand, has several advantages. First, physical examinations are easily done by medical people. High reliability between medical classifiers may be predicted because most medical classifiers have good training in physical evaluations and they can follow "standard testing procedures" to evaluate athletes' impairments (McCann, 1991, 1994c). Second, impairments of athletes are not likely to change if their impairments are not progressive. Therefore, it is necessary to adopt *standard* and *reliable* physical examinations to measure the unchanging impairments. When the unchanging factors are "objectively" recorded, the classification process and results seem to be more meaningful and reasonable. It means that classes between athletes are more comparable.

In summary, medical knowledge has been used in the development of disability sport classification for a long time. Specificity, the analyses of impairments of athletes have been thought important and irreducible because most athletes' physical abilities and profiles can be understood and objectively recorded by medical classifiers. From a practical point of view, medical concepts and knowledge are useful resources to identify athletes' characteristics of impairments and to measure some of their impairments (McCann, 1991, 1994c). Those data are helpful for classifiers to more objectively assign athletes to classes. However, several questions still have not been clarified by empirical studies. For example, what kinds of medical knowledge should be used in the classification process? How do classifiers apply their medical knowledge in the actual classification? Is it necessary that a lot of medical knowledge is used in sport-specific and integrated classification?

2.7.2 Sport Knowledge

With the advent of functional classification, sports knowledge has became an important resource in the development of sport-specific classification systems. The use of sports knowledge in classification focuses mainly on understanding the relationships between functional abilities and sports skills of people with physical impairments. In other words, sport knowledge contributes to the "analyses of movements behaviours of athletes" (McCann, 1991, 1994b). When the term "analyses of movement behaviours" is explained in more detail, McCann noted that observation of functional performances of athletes and then understanding of their movement patterns relevant to sport-specific needs are the main procedures used to group athletes.

As discussed in Section 2.2, sport concepts have been used in a few sport classifications since the mid-1980s and sport-specific classification systems have been broadly used since the early 1990s. In particular, each sport classification system has its specific needs. For example, trunk and arm functions have been more important than leg functions in wheelchair basketball, wheelchair table tennis and wheelchair racing when these sport classification systems have been developed. As a result, more tests are used to assess arm and trunk than leg functions of athletes in the classification process of those sports.

Due to the specific demands and characteristics of sports, different skills and functions are needed in each sport. This idea has been particularly prompted by Riding (1994), Strohkendl (1991), Thiboutot and Coutts (1990), and Steadward (1996). Classification should consider athletes' basic sports techniques and functions to match each sport. Therefore, different classification systems, different evaluations, and different classes should be presented in different disability sports. For example, there are five classes in wheelchair table tennis, five classes but eight different classification points in wheelchair basketball, seven classes in wheelchair rugby and only one class in wheelchair tennis (International Paralympic Committee, 1995). However, in general, wheelchair basketball and tennis players tend to have paraplegia or amputation in lower extremities; wheelchair rugby players have tetraplegia and wheelchair table tennis players have paraplegia or tetraplegia. This fact illustrates that each class in different sports may present different ranges of abilities and disabilities. This affects the different ways in which fairness of competition and sport-specific needs are met.

Reviewing the current IPC classification manual, it is easy to see that sport knowledge is widely applied in classification. For example, the current wheelchair basketball classification system specifically addresses athletes' movement patterns in different classes when athletes perform some functional abilities such as pushing a wheelchair, passing, shooting and catching the ball, and rebounding. Compared to the sport knowledge and movement patterns, the information of impairment and related medical knowledge for wheelchair basketball classification is very limited. In addition to wheelchair basketball classification, swimming classification is another good example to illustrate the importance of sport knowledge used in the classification process and the development of the functional classification system. Practical profiles of swimmers in each class focus on the swimmers' execution strokes, body position, turning, and diving. All are illustrated in the newest swimming classification system. However, impairment profiles of swimmers are also particularly emphasized in swimming classification (SAEC-SW, 1998). Sport and medical knowledge both play important roles in swimming classification.

Generally speaking, different functional profiles and techniques for athletes with different severities of physical impairments should be presented in sports classification handbooks. At the moment, swimming, wheelchair basketball and table tennis have included a lot of sport knowledge in the classification procedures (International Paralympic Committee, 1995). Several sport concepts have been presented in those sport classifications although functional profiles in classification handbooks may not be detailed enough because of insufficient research and practical information. This trend may prompt the addition of more sport concepts and functional profiles into the classification handbooks in other sports in order to more completely match those sports' needs. However, there is a case for sport knowledge to be quantitative in its application in classification (Quade, 1994). Studies in sports sciences such as sports biomechanics provide more clear quantitative strategies in the analysis of disability sports (Cooper, 1990). For example, which muscles are necessary and important when athletes push wheelchairs and what body movements can be observed? Such questions should be answered in each sport (but questions should be modified for different sports) to understand the sports characteristics, and then these data can be considered to develop or improve sport-specific classification systems.

Despite the advantages of sport knowledge used in classification, the problems that challenge the validity and objectivity of sport-specific classification should not be ignored. Specifically, what sport knowledge should be used and how can classifiers use sport knowledge in classification more systematically and impartially? As mentioned earlier, if medical knowledge should be used in disability sports, how do classifiers use medical and sport knowledge together in classification? These basic questions need to be identified so that more people may regard sport knowledge as important in the development of classification systems.

2.8 Factors Influencing the Development of Classification Systems

There are several factors influencing the development of classification systems. They include medicine, sport, politics, ethics, equipment, sociology, psychology, economics, and administration. In the previous section, the medical and sport knowledge used by classifiers in the classification process was discussed and the influences of medicine and sport on the development of classification systems were also discussed. In this section, other factors that influence the development and reproduction of the classification system are discussed, respectively. However, it needs to be recognised that these resources may be used together for rule-makers to develop and reproduce classification systems.

2.8.1 Influence of Politics

In disability sport, Craven (1990) has stated that classification has been dominated by a few medical classifiers. He claimed also that medical committees, like advantaged political groups, completely controlled the development of classification when the concept of functional classification was introduced in the early 1980s. However, only a few articles have discussed classification from a political perspective. Generally speaking, politics has been a major influence upon the following issues.

- Should medical classification or functional classification be used in each sport?
- How many classes should there be in each sport?
- What are the standard criteria in each class for different sports?
- What is the minimal impairment in each sport?
- Should athletes with severe impairments be included in each sport?

In 1987 the future directions of classification were settled at the Arnhem seminar (McCann, 1987; Squires, 1987; Steadward, 1996). Representatives from 39 countries and six international sports federations for the disabled voted on many issues about classification. A lot of political decisions were made. It was decided, for example, to promote integrated classification systems and sport-specific classification systems that should be developed continuously; to reduce the number of classes to some extent; and to support future classification systems with scientific knowledge and research.

Craven (1990) has illustrated how politics has affected the wheelchair basketball classification. Initially, the medical committee of the ISMWSF developed the classification system although the medical classification was too rigid (Craven, 1990) and Strohkendl (1985) identified some weak points of the system. However, medical classifiers would not accept the viewpoints of athletes or technical people in terms of sport-specific classification. This struggle lasted for several years. Under the continual insistence and political actions of players and coaches, the player classification system was finally substituted for the traditional medical classification in international wheelchair basketball (Strohkendl, 1996). Craven (1990) specifically claimed this was an important victory for players and wheelchair basketball in the long political process.

With regard to the issue of minimal impairment in classification, currently each sport may have different criteria. Some sports develop sport-specific minimal impairment criteria (e.g., swimming, wheelchair basketball) and some sports use impairment-specific minimal requirements (e.g., CP sports) (Biering-Sorensen, 1994; Quade, 1994). No matter what criteria of minimal requirements are used in sports, however, political factors need to be considered seriously because many athletes may or may not be eligible under this classification rule (Natvig, 1994; Quade, 1994; Steadward, 1996).

The issue of athletes with severe impairments (e.g., tetraplegia or quadriplegia) who were included in each sport has also been discussed for several years (Craven, 1990; Quade, 1994; Strohkendl, 1991). Rule-makers developed classification systems and then classification systems in turn apparently affect the participation of athletes with severe impairments. If sports have specific classes for athletes with severe impairments, perhaps more athletes with severe impairments would be encouraged to participate in disability sports. Actually, there are only a few disability sports that are developed for people with severe impairments. For example, boccia and wheelchair rugby were selected only for athletes with severe impairments to compete in the 1996 Paralympic Games (International Paralympic Committee, 1995). However, it is believed that people with severe impairments should have more opportunities to participate in sports and physical activities, to compete in the international levels, to represent their countries for competitions, and to be recognised as elite athletes. Undoubtedly, politics plays an important role in deciding who should be included in the classification systems and disability sports.

2.8.2 Influence of Ethics

In modern sports, *winning* and *fairness* of competitions are two important aspects. However, some athletes are only concerned with winning in competitions and they may try to gain some advantages by unethical methods. For example, able-bodied athletes may take drugs or use blood doping to improve their physical fitness and athletic performance (Coakley, 1994; Simon, 1991). We recognise this as cheating because it apparently influences the fairness of games. Therefore, the International Olympic Committee (IOC) set up strict rules to penalise this unethical behaviour if athletes are proved to use doping. This ethical issue has appeared in the able-bodied competitions for a long time (Kruimer, 1994; Simon, 1991).

In disability sports athletes may also cheat. In particular, cheating in classification is one of the important issues that have been discussed seriously among classifiers (Davis & Ferrara, 1996). Generally, in classification processes classifiers evaluate athletes' impairments, physical abilities and functional abilities. If athletes purposely do not show their real abilities and functions in classification and the classifiers do not detect it, athletes may be misclassified. Thus, these athletes may be classified into lower classes and so they gain some advantages (i.e., lower classes) in competition (Atlanta Paralympic Organising Committee, 1996; Craven, 1990).

Illman (1994) has stated two reasons why some athletes may not show their real functional abilities during classification. First, they may not want injuries when trying hard to do what classifiers ask them to do. Second, they may not want to waste their energy in classification because most classifications are held one or two days before the competition. As a result, these athletes may gain an unfair advantage. A few athletes may not cooperate with classifiers on purpose. They really want to take advantage and win the competitions by being classified in lower classes. Some athletes have tried to fool classifiers and have succeeded where classifiers do not have enough experience to detect it (Craven 1990; Illman, 1994). Illman also notes that cheating in classification should be penalised in the same way as taking drugs or blood doping in able-bodied or disability sports. However, very few articles have discussed this ethical issue in any depth.

At the 1996 Paralympic Games, there were regulations for dealing with athletes who cheated in classification. If athletes were detected as cheating in classification, they were disqualified immediately (Atlanta Paralympic Organising Committee, 1996). This was the first time that a disability sport organisation has developed strict rules to deal with the issue of classification cheating. However, it is very difficult to prove that an athlete cheated in classification and no athletes were disqualified at the 1996 Paralympic Games because of classification cheating.

Another ethical issue in classification is the *tactical protest* in which athletes or coaches deliberately protest the classification of athletes from other countries. The athletes who have been protested cannot completely concentrate on their competitions and practices because they may worry about changes to their classes. Davis and Ferrara (1996) claimed that this unethical protest was a psychological strategy to affect an opponents' performance. In this case, disability sport classification may be abused by a few people to affect athletes' rights. Thus, the Atlanta Paralympic Organising Committee (1996) in particular set up appeal or protest regulations of classification to prevent this unethical strategy. Every athlete should not be classified more than twice in a competition. In addition, only a few people such as the head classifier and team manager can raise a classification appeal or protest during the Paralympic Games. Those rules help avoid the occurrence of the tactical protest.

2.8.3 Influence of Sociology

Classification in disability sports is both a social process and product. Because everyone needs fair competition, the classification system has been socially constructed and utilised. However, many problems derived from classification such as conflicts, power relations, unequal status, social interaction within the group, social control, social functions, social roles and other sociological issues can be observed in the social collective of disability sports (Shibutani, 1986). It would be helpful to clarify and improve classification systems and processes by using a sociological perspective. Unfortunately, there are few sociological articles that have focused on classification.

Craven (1990), for example, has noted the uneven power and unfair status between wheelchair basketball players and medical classifiers when the medical classification system was used in wheelchair basketball. Medical classifiers controlled athletes and the classification process, but they may not classify athletes correctly. Little by little, conflicts occurred because many disadvantageous conditions affected the rights of wheelchair basketball players. An alternative approach, the player classification system (i.e., functional classification), was developed and, apparently, many conflicts in classification were gradually reduced or disappeared.

Strohkendl (1996) has stated that players' active participation in classification changed the phenomenon of uneven power between athletes and classifiers. By means of good communication, discussion and negotiation among classifiers, athletes and coaches, most athletes may be happier to accept the results of classification. This supports Riding's (1994) idea that leadership in classification should be shared. Riding believes that classification should be an "athlete-centred" system because competition is for athletes not for classifiers or other people. Medical classifiers should not dominate the entire classification process. Classification systems, then, should be acceptable and understandable by most athletes, coaches and medical or technical people.

In short, the field of disability sport reflects other aspects of social life. From sociological viewpoints, many social phenomena in classification can be observed. Without clarifying these social problems and understanding them in depth, the development of disability sport will be influenced and the fairness of competitions will be threatened by hidden but important classification issues.

2.8.4 Influence of Equipment

Equipment may have an enormous influence on the performance of athletes. Specifically, many kinds of equipment such as wheelchairs, prostheses, crutches or canes, braces, and strapping have been used in disability sports (DePauw & Gavron, 1995; McCann, 1979a; Shepherd, 1990; Weiss & Curtis, 1986). Contemporary disability sports are dramatically affected by modern engineering, technology and science (DePauw & Gavron, 1995). A lot depends on the individual needs in sports. Recently, more specific functions of wheelchairs were designed for athletes to attend specific sports in order to achieve their best performances (DePauw & Gavron, 1995; Higgs, 1992; Shepherd, 1990). A few researchers from the research area of sports biomechanics have discussed the importance of specific wheelchair design (Cooper, 1990; DePauw & Gavron, 1995; Higgs, 1983). Specific wheelchair design and strapping may compensate for the impairments of athletes to improve their performance (Burd, 1987; DePauw & Gavron, 1995). In other words, athletes can gain advantages if they use the most appropriate equipment for their specific needs.

Standardization of equipment is used to avoid unfairness in competitions. Thus, some regulations about sports equipment were added in the recent IPC handbook to deal with this issue (International Paralympic Committee, 1995). From a practical point of view, those rules may try to reduce the extent of the unfairness of competitions and classifiers should not forget to consider the effects of equipment on actual performances although most athletes' classes are not changed by using specific equipment. However, modifications of wheelchairs, prostheses, braces and strapping are of serious concern in wheelchair basketball classification. Players may be changed into higher classes when equipment obviously or partially compensates for impairments and enhances athletic performance (Courbariaux, 1992, 1996) but this may depend on classifiers' interpretation and experience.

There are very limited studies that have examined the relationship between equipment, performance and impairments in considerable detail. In other words, some basic questions, such as "what kinds of physical impairments of athletes and what severity of physical impairments of athletes can benefit from specific designs of equipment", need to be answered so that later more knowledge on the topic can be developed and applied in actual classification practices. Generally speaking, at the moment it is difficult for classifiers to extensively consider the influence of equipment on classes, although many people may be aware of the importance of equipment on enhancing athletic performance.

2.8.5 Psychology

According to Thiboutot and Curtis (1990), when athletes are classified, they hope to be treated as athletes and not patients. They claimed that athletes do not feel respected as athletes when they are always made to lie down on the bench and undergo physical examinations in classification by medical people. Although only a limited number of articles have discussed classification from the psychological perspective, it is essential to understand athletes' feelings and opinions on many classification issues. In addition, the feelings and opinions of athletes with different types of physical impairments need to be investigated, compared and analysed separately and/or together. If athletes' feelings and opinions are taken into consideration seriously in developing and improving classification systems, it is believed the sport-specific classification may be more acceptable and supported by athletes (Craven, 1990; Riding, 1994; Strohkendl, 1996).

2.8.6 Economics

Economics is also an important factor that may affect the development of modern disability sports. When the public are aware of the achievements of athletes with impairments, and many people enjoy watching and participating in disability sports, then commercialism seems to follow. This is evident in able-bodied sports. Mass media, such as television, newspaper, radio, and sports magazine influences and controls sports (Coakley, 1994). Also, under the excessive reports of mass media, sports stars are well known. Athletes directly or indirectly owe privilege, money and good social positions and honours to their fame and commercial worth in sport (Coakley, 1994).

Gradually, this trend has begun to influence disability sports. More and more athletes with physical impairments look forward to attending the Olympics and Paralympic Games. In particular, athletes hope to attend a credible Games which the public recognise and to which the mass media are attracted (Hainey, 1994). However, a big dilemma is the large number of winners in disability Games. Spectators cannot understand why so many winners are produced in the Games for athletes with impairments and how many classes are assigned in disability sports. Hainey (1994) has noted that impairment-specific classification apparently decreased the credibility of disability sports because of the small numbers of athletes in each class and the relatively low standard of competition. Only when classes are reduced, the strength of competition improves and classification systems seem reasonable, may disability sports gain credibility from the public. When the public has an understanding of the high levels of competition and impressive athletic achievements, then the media will follow (Hainey, 1994). As a result, this may serve to educate the public further to respect athletes with impairments and encourage young people with impairments to participate in sports. However, the influence of economics on the development of classification has not been investigated in any depth.

In addition, some countries (e.g., China, Malaysia, Taiwan) offer money for elite athletes with impairments if athletes win medals at the Paralympic Games or comparable international competitions. In this case, the number of classes in disability sports may significantly affect the possibility of winning medals. Although some athletes may understand that too many classes may reduce the strength and credibility of competition, others are concerned that too few classes make it difficult to win medals, and that they may not gain any financial support and actual rewards (e.g., money) from their countries if they cannot win. However, this question has not been empirically examined.

2.8.7 Administration

From the viewpoints of administration, too many classes in disability sports have affected the efficiency of management of disability sports. In particular, using the impairment-specific classification systems, combination of events often occurs in national or international competitions because of too few athletes in a class. Shepherd (1990) claimed that "attempts to achieve greater fairness through a more precise categorization quickly become counterproductive" (p. 44). The complete fairness of classification may narrow the range from the upper to the lower limit of a class. Therefore, many classes may be produced and it is possible that the number of medals ridiculously exceeds the number of competitors (Lindstrom, 1986; Shepherd, 1990). On the other hand, this complete fairness is not a practical objective in disability sports (Steadward, 1996; Shepherd, 1990). However, some researchers argue that too few classes may result in unfairness although it may be easier to administer competitions and understand classification (Vanlandewijck, et al., 1995). Thus, it is always difficult to balance the idea of a reduction in the number of classes to meet the needs of sports administration and a concern for fairness of competition within a reasonable number of classes.

In classification research, Davis and Ferrara (1996) are the only authors to describe the classification process in some detail. They used the classification of the 1996 Paralympic Games as an example to explain the relationship between sport administration and the classification process. They highlighted a major problem in the administration of Games if the appeal or protest process of classification is not well controlled. For example, if any athlete's class is changed because of a classification protest during competition, the schedule or event programmes of competitions would need to be changed. Administrators need to rearrange the schedule of the Games immediately. This is a difficult job and always full of challenges in the International Games. If administrators cannot handle the problems of changes of classification then the whole competition may be disrupted suddenly. Therefore, the issues concerning classification appeals or protests and changes of classes of athletes should be dealt with carefully. Recently, these things have been addressed in some classification systems and rules (SAEC-SW, 1998).

In summary, a variety of factors which influence the development and reproduction of the classification systems have been reviewed. However, the limited classification research in the literature has put more emphasis on discussions of medical and sport knowledge used in classification. With respect to establishing a more complete view for the development of classification, other factors which were mentioned above should not be neglected by researchers and practitioners. Only when multiple viewpoints are considered and used, classification systems can be developed more completely and classification processes can be improved more smoothly and clearly. Thus, to establish more knowledge in this important topic, more research from different perspectives needs to be implemented urgently.

2.9 Controversial Issues in Disability Sport Classification

Several controversial issues have been reported in the classification literature although most of them have not been examined and discussed in great depth. There are four main reasons that explain the many controversies in disability sport classification.

First, classification arises from practices instead of research. Second, many classification systems have not been developed or revised systematically and regularly, and classification has not been examined completely. Third, limited perspectives are used in classification research. Finally, concepts of segregation, integration and inclusion are adopted in disability sports and these concepts obviously influence the development of classification. The first three points have been reported in this chapter several times. In this section, the concepts of segregation, integration and inclusion in disability sports are specifically discussed and later the controversial issues are summarised.

2.9.1 Segregation and Integration in Disability Sports

"Segregation" and "integration" in disability sports are two important concepts. The simplest example of segregation in disability sport is that athletes with different types of physical impairments cannot compete together in the same event. In other words, athletes only compete with those who have the same type of impairments. For example, only athletes with CP are allowed to attend the CP-ISRA Games. Thus, classification in this competition is designed to group together athletes with CP. Generally speaking, when using the idea of segregation in disability sports, there are four types of competitions for four types of impairments: SCI, CP, amputations and les autres. Each type of impairments also has different classes and its own competitions. Therefore, two factors- the type of impairments and the severity of impairments- make classification in disability sports confusing with too many classes. However, the concept of segregation was used in most disability sports from 1950 to 1980. Prior to 1976, in particular, all competition was segregated (Steadward, 1996).

It may be thought fair to segregate athletes with different types of impairments into different competitions. This is because only athletes with similar diagnosis (i.e., the same type of physical impairment) and severities of impairments can compete together. From a medical point of view, no athletes with impairments may apparently gain advantages because of their physical abilities. However, disability sports may become less credible and competitive. For example, there are 30 separate classification categories for the variety of impairment groups if impairment-specific classification systems are used in the current Paralympic Games: seven classes for spinal cord injured athletes, eight classes for athletes with CP, nine classes for athletes with amputations, and six classes for les autres athletes. The result of such impairment-specific classification systems makes an unusually high number of medals awarded (Steadward, 1992). Thus, to maintain the legitimacy of competition, many events need to be reduced because of too few numbers of athletes in a class (Hainey, 1994; Steadward, 1996). As a result, combinations of events may produce more unfair competitions or a cancellation of events may reduce the opportunities of athletes to participate and compete.

On the other hand, the concept of integration- athletes with different types of physical impairments compete together- has been promoted since the early-1980s (Lindstrom, 1985). However, there are two main meanings of integration in disability sports. First, integration means that athletes with different types of physical impairments are allowed to participate in the same championships but they may not compete in the same event. The obvious example of the idea is that athletes with different impairments attended the 1984 and 1988 Paralympic Games but each type of physical impairments might have its own events (Steadward, 1992). Second, integration may mean that athletes with different types of impairments participate in the same championships and they also compete together (Holland, 1994; Steadward, 1996). The idea can be seen in several sports such as fencing, wheelchair basketball, swimming, table tennis, at the 1992 and 1996 Paralympic Games. Using the latter idea of integration in disability sports, there is a big problem that threatens the credibility of competition; that is, the kinds of classification systems used to maintain the fairness of competition for athletes with different types of impairments (Holland, 1994; Richter, et. al., 1992). Integration may enhance the strength of competition, but it is very difficult to rationally explain why athletes who have different characteristics of impairments could compete together. At present, the idea of integration in disability sports is accepted as athletes with different types of physical impairments do compete together. Holland (1994) specifically noted the term "sport-specific integration" to present the general idea. Now only a few disability sports in IPC still use the idea of segregation or some impairment-specific sport organisations still regularly hold their own impairment-specific competitions instead of integrated events (Steadward, 1996). Those impairment-specific championships specifically encourage participation of new and developing athletes.

Using the idea of integration in disability sports may be a political decision (McCann, 1987; Steadward, 1996). When the future of disability sports was discussed at the Arnhem seminar of 1987, three conclusions related to integration were made: (a) support for the reduction in the number of classes; (b) support for an integrated functional classification system used in disability sports in order to reduce the number of classes and improve the quality of sport competition; and (c) support for the integration of athletes with impairments into able-bodied competitions such as Olympic Games (Steadward, 1996, p. 32). Before the 1987 Arnhem seminar, Lindstrom (1985) and Strohkendl (1986) argued that functional classification seemed to be the most appropriate way to integrate athletes with different types of impairments and also achieve fairness of competition. Although the arguments of Richter et al. (1992) on functional classification are persuasive, actual functional classification systems used in many disability sports were not systematically evaluated before they were implemented at the Paralympic Games with the exception of wheelchair basketball classification system (Davis, 1994; Vanlandewijck & Chappel, 1996).

Historically, disability sports have been influenced strongly "by the medical establishment with disability and rehabilitation at the centre of its development" (Steadward, 1996, p.28). It was not until the last 10 years that disability sports have changed dramatically. Steadward (1996) noted "in 1989 the Paralympic movement began to move to a *sport-based* model in order to take the emphasis away from disability and rehabilitation" (p. 28). By changing the focus of disability sports to athleticism, "sporting excellence" and high-level competition are the main characteristics in the current Paralympic Games and disability sports. Adopting the concept of integration in disability sports can help to achieve the idea of sporting excellence.

Inclusion is another important concept used in disability sport. Inclusion may mean (a) disability sports are included in able-bodied sports or (b) able-bodied people are allowed to participate in some disability sports. With respect to the first point, IPC established a Commission for Inclusion of Athletes with Disabilities (CIAD) which worked to promote a few disability sports and events in the Olympic Games. Although IOC had permitted demonstrations of a few disability sport events since the 1984 Olympic Games, IPC expects that IOC will accept the legitimacy of disability sports (i.e., medal-awarded) and then people will acknowledge the sporting excellence of athletes with impairments. Steadward (1996) noted:

> In the past, sport opportunities for athletes with a disability have been regarded as a low-priority need, rather than a basic right, and thus the profile, visibility, and status of such sport opportunities have been perceived as second class. But athletes today regard themselves worthy of Olympic status. This vision is reflected by the IPC, which contends that disability sport can best be recognized for its true athleticism with appropriate integration throughout the entire sport system (p. 35).

However, the numerous classes and diversities of disability sports prompted the IOC to withdraw the chance of inclusion of athletes with impairments in Olympic Games. The IOC did not want inclusion to reduce the credibility of Olympic Games. Perhaps the only solution at the moment is that a few elite disabled athletes in a class are recruited for the Olympic Games and they may not need detailed and complex classification like the Paralympic Games. For example, two wheelchair racing events (i.e., 800 m wheelchair track event for women and 1500 m wheelchair track event for men) were exhibited at the 1992 and 1996 Paralympic Games. Only one class and a few best wheelchair racers were invited. In the future, the similar idea of inclusion of elite athletes with impairments into the medal-awarded Olympic Games may be adopted although so far it has been unsuccessful (Steadward, 1996).

In addition, inclusion of the able-bodied into disability sports has been supported by Brasile (1990, 1992). Brasile claimed that integration of the disabled and nondisabled in recreation and sport opportunities can enhance the awareness of the public in disability sports and people may focus more on the *ability* of the participants not the disability or impairment. Moreover, inclusion of the able-bodied on disability sports can help the social integration of people with impairments because they can have more opportunities to interact and cooperate with their able-bodied peers in training and competition (Brasile, 1992). Brasile also used wheelchair basketball as an example to illustrate the idea of successful inclusion of the able-bodied into wheelchair sports. He noted that inclusion of able-bodied athletes would further improve the normalization process (Brasile, 1992) and cited the Canadian leagues as a successful example of able-bodied participation in wheelchair basketball.

Thiboutot, Smith and Lanbnowich (1992), however, have disagreed with Brasile's suggestion of inclusion of able-bodied athletes in international levels of competitive wheelchair sports. Specifically, they used the term "reverse integration" to represent the Brasile's idea. They argued that inclusion of the able-bodied into disability sports would reduce competitive opportunities for people with impairments and that Brasile's idea of inclusion primarily emphasized rehabilitation rather than competitive sport. Thiboutot et al (1992) agreed only that able-bodied participation in disability sports should be confined to the recreational levels. Moreover, they claimed that the issue of reverse integration in wheelchair basketball or other sports should be decided by athletes themselves instead of people without impairments. Lindstrom (1992) also argued that inclusion of able-bodied athletes in disability sports may not be fair for athletes with impairments in terms of physical abilities, training opportunities, etc. The issue of reverse integration was formally discussed at the IPC General Assembly of

1993. The final conclusion in the meeting was that reverse integration or inclusion of able-bodied athletes should not be encouraged or introduced in international competition (Lindstrom, 1994; Vanlandewijck & Chappel, 1996).

Although able-bodied participation in training and competition in disability sports may improve the strength of competition, classification for people without permanent physical impairments creates major problems (Thiboutot, et al., 1992; Vanlandewijck & Chappel, 1996). For example, what class should able-bodied individuals be assigned in different *disability sports*? What criteria should be used to decide the classes of able-bodied athletes in *wheelchair sports*? Will classification for the able-bodied reduce competitive opportunities for athletes with impairments and produce a fair competition which includes athletes with and without physical impairments? These are some of the relevant issues that simultaneously include concepts of classification and inclusion of able-bodied athletes in disability sports. However, there is little literature available that has discussed them in depth.

2.9.2 Summary of Controversial Issues in Disability Sport Classification

To sum up, there are many controversial issues in the literature that challenge impairment-specific or sport-specific classifications. Some important issues are particularly noted, such as:

- lack of sufficiently scientific evidence and empirical data to support sport-specific classification systems;
- unclear rationales in sport-specific classification systems;
- qualification of classifiers and reliability of classifier teams;
- validity of impairment-specific or sport-specific classification systems;
- clarification and explanation of classification processes;

- detailed resources used in classification process;
- different factors which are used to construct and revise classification systems;
- lack of systematic outcome analyses of classification;
- segregation or integration of different types of impairments in disability sports;
- inclusion of athletes with severe impairments in disability sports;
- minimal impairments of athletes in disability sports;
- objectivity of evaluations and measurements in classification;
- use of the functional or medical approach in classification;
- athlete-centred or classifier-centred classification systems and processes;
- number of classes in disability sports;
- inclusion of athletes with impairments in the Olympic Games; and
- inclusion of able-bodied athletes in disability sports.

These issues may guide the directions of the future classification research. If a classification system is to be more acceptable and less doubtful, every sport committee needs to collaborate with more researchers in order to clarify and examine most of the above issues. If this can be achieved, the sport-specific classification systems used in disability sports will be more successful, effective and scientific.

2.10 Concluding Remarks

Most people in disability sport agree that classification is crucial for fair competition. Fairness and credibility of competitions are strongly relevant to classification. However, there are a limited number of studies investigating the topic and trying to deal with the many controversial classification issues in order to maintain the fairness and credibility of competition for people with physical impairments. Among disability sports, wheelchair basketball classification is the only exception which has been examined more systematically and is focused on sport-specific needs (Strohkendl, 1986, 1991, 1996; Vanlandewijck & Chappel, 1996). Researchers have a number of relevant concepts developed and identified in wheelchair basketball classification research. Thus, those concepts may be modified and then used in the development and evaluation of classification systems and processes in other disability sports.

It is important that classification practices and research should be strongly linked. To date, however, research on the topic is running far behind the speed of practical development of classification systems. Vanlandewijck and Chappel (1996) specifically thought this unusual phenomenon was due to "the rapidly evolving world of sports for athletes with a disability" (p.82). It would be argued that there is a lack of systematic models to guide classification research in disability sports. A limited number of classification articles have been published but most research studies are very fragmented. They have failed to influence or clarify classification problems, to help the construction and revision of classification systems, in educating athletes to understand classification systems, and in improving the quality of classification.

Disability sport classification is socially constructed and it is a very complex social process. A variety of interrelated factors including medicine, sport, politics, cultural rules and economics influence that social process. On the basis of a review of classification literature, it is recommended that research should focus on several areas. They are (a) to identify classification processes from different perspectives in greater depth, (b) to combine different approaches to examine classification outcomes and evaluate classification systems, (c) to understand the characteristics of classifiers and their actual roles in disability sport, and (d) to broadly discuss resources which are used in the development and revision of classification systems. Once research can clarify these basic and important questions in a specific sport, a systematic classification model may be developed. Most importantly, researchers may extend the research results and relevant concepts and use the model to other sports. Gradually, more classification issues would be clearly and systematically identified. Thus, strategies can be developed to tackle the problems in disability sport classification to achieve the purpose of classification and the *optimal* classification system may be developed successfully.

CHAPTER 3

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Introduction

This chapter introduces the theoretical framework of the thesis and discusses the general research methods used in the empirical studies that accompany the tasks of theoretical development. It is divided into two main sections. The first section (3.2) describes the developing process of the theoretical framework for classification research. It also includes a rationale for a theoretical model in classification research and how it is developed. The second section (3.3) describes the general research methods used in the collection of data in this research project. It includes the methods of participant observation, interviews, the use of questionnaire, and an analysis of secondary sources such as official documents and reports. The advantages and disadvantages of each research method are also discussed.

3.2 Development of the Theoretical Framework

Disability sport classification is an important topic and it is currently based more on practice and discussion than research. (Campbell, 1992; Cooper, 1990; McCann, Davis, & Richter, 1994). As discussed in Chapter 2, there is a lack of systematic and scientific research studies to examine the topic and the complexity of the classification process. Thus, it is suggested a theoretical classification model which is grounded in the empirical classification situation and also covers broad elements and concepts in disability sports is urgently needed. The model serves as a heuristic device for the research in this project and for future research. It can contribute, also, to the development and improvement of classification systems. Most importantly, it helps us to understand the complicated classification process.

3.2.1 From Practical Experience to the Theoretical Model

My previous classification experience was used to establish a starting point. I had been a national classifier in swimming, wheelchair basketball and table tennis in Taiwan; an international swimming classifier trainee; a medical and classification coordinator for the Taiwanese disability sport organisation and I had an educational background in physiotherapy and sport science. Thus, before I started the classification research and the development of the classification model, I had knowledge of some of the basic concepts of disability sport classification and had some real practical experience (see Table 3.1). In addition, the relevant literature in disability sport classification was extensively searched, collected and reviewed, and then more classification concepts and knowledge were developed. Also, Giddens's structuration theory, with its emphasis on the social structure, social system, social actions, and rules and resources, provided a good starting point where classification practices and sociological concepts could be combined (Giddens, 1979, 1984). As a result, the initial theoretical classification model (see Figure 1.1) was established in March 1996. Generally speaking, the development of the model relied heavily on the researcher's previous practical experience in classification and Giddens's theory and partially on review of classification literature and discussion with other researchers.

A theoretical model is useful when it reflects theoretical links with the actual social situations. To understand the social world of disability sport and identify the social process in the classification interactions among social agents, a series of classification studies using participant observations, survey and other research methods were planned and then conducted. The final goal of the research will be to develop a model that has proper rationales and is grounded in actual classification practices.

Because the social world is not fixed and rigid, the long-term participation in the classification fields and direct observations of the dynamic interactions among social actors were considered the most suitable ways to collect empirical data and to understand social phenomena in depth.

3.2.2 Participation and Observation in Classification and Competition

As mentioned before, to increase the classification experience and understand the context of the classification process, researchers who participate in classification at national or international competitions are very important. Also for researchers a lot of classification issues may be discovered and identified through direct participation and observation. Since the middle of 1996, I have participated in several classifications at the national and international disability sport competitions, particularly in swimming and wheelchair rugby. Detailed information concerning participation in swimming classification and wheelchair rugby classification is listed in Table 3.2 and Table 3.3, respectively. During the long-term data collection (i.e., from June 1996 to October 1998), I spent over 400 hours in observations of the swimming classification and about 70 hours in wheelchair rugby classification. Specifically, using the initial classification model as a guide, the interactions between classifiers and athletes and among classifiers and their behaviors in the classification process were observed and noted in order to identify the classification process as a social process in greater detail.

The understanding resulting from this experience in swimming and wheelchair rugby classification was considerable. Indeed, long-term participation in swimming and wheelchair rugby classifications was sufficient to gain qualifications as an international swimming classifier in August 1997 and a British wheelchair rugby classifier in 1997. These qualifications let the researcher have more opportunities to attend future classification in national or international levels of competition. In addition, I was also allowed to observe and develop an understanding of wheelchair basketball classification at the 1997 ISMWSF Games, CP classification at the 1997 World CP-ISRA Games, table tennis classification at the 1998 World Wheelchair Games and 1998 World Table Tennis Championships (see Table 3.4). Although I only spent 25 hours on observations and did not do any classification in those formal two competitions, the *extra* experience was invaluable. Participant observation at the international table tennis classification provided more opportunities to understand other sports. Spending 90 hours in two IPC table tennis committee sanctioned competitions helped me to gain an understanding of international table tennis classification. Thus, I saw more disability sport classifications and experienced other sport-specific (i.e., wheelchair basketball and table tennis) and impairment-specific (i.e., cerebral palsy) classifications and their classification processes. In particular, "being around" in the classification fields allowed me to understand the culture of the classification group, to observe how classifiers interact with athletes and other classifiers, to hear how classifiers communicate with athletes and other classifiers, to compare the ideal classification evaluations that are mentioned in the classification manual with the actual evaluations, and to identify resources used by the social actors in the social interaction. Later, the advantages of "being around" will be discussed in depth (see Section 3.3.1).

Table 3.1 Previous Experience in Disability Sport Classification

Date	Competition	Level	Place	Position
Mar 1994	1994 National Disability Sports Championships	NC	Kaochung, Taiwan	P
Mar 1994	1994 Australian Swimming Championships	NC	Melbourne, Australia	P
Oct 1994	1994 World Swimming Championships	IC	Malta	P
April 1995	1995 Taiwan Table Tennis Championships	NC	Taichung, Taiwan	P
May 1995	1995 Taiwan Swimming Championships	NC	Taipei, Taiwan	P
Aug 1995	Paralympic Swimming Trial	IC	Atlanta, USA	P
Sep 1995	General Disability Sport Classification Seminar	NC	Taipei, Taiwan	P
Jan 1996	Swimming Classification Seminar	NC	Taichung, Taiwan	P
Jan 1996	Table Tennis Classification Seminar	NC	Taichung, Taiwan	P
Jan 1996	Wheelchair Basketball Classification Seminar	NC	Taichung, Taiwan	P

Note. IC: international competition; NC: national competition; P: participant.

Table 3.2 Participation in Swimming Classification during the Study Period

Date	Swimming Competition	Level	Place	Hour	Position
June 1996	1996 British Swimming Championships	IC	Sheffield, UK	10	PO
Aug 1996	1996 Paralympic Games	IC	Atlanta, USA	120	PO
Nov 1996	1996 British Swimming Short Course Championships	NC	Darlington, UK	12	PO
Mar 1997	1997 British Junior Swimming Championships	NC	Darlington, UK	12	PO
July 1997	1997 International Stoke Mandeville Games	IC	Stoke Mandeville, UK	10	PO
Aug 1997	1997 European Swimming Championships	IC	Badajoz, Spain	70	PO
Nov 1997	1997 British Swimming Short Course Championships	NC	Darlington, UK	12	PO
Mar 1998	1998 British Junior Swimming Championships	NC	Darlington, UK	12	PO
June 1998	1998 British Swimming Long Course Championships	IC	Sheffield, UK	16	PO
Oct 1998	1998 World Swimming Championships	IC	Christchurch, NZ	140	PO

Note. IC: international competition; NC: national competition; PO: participant observation.

Table 3.3 Participation in Wheelchair Rugby Classification

Date	Competition	Level	Place	Hour	Position
June 1996	1996 British Wheelchair Rugby Championships	NC	Stoke Mandeville, UK	12	O
July 1996	1996 International Stoke Mandeville Games	IC	Stoke Mandeville, UK	20	PO
Aug 1996	1996 Paralympic Games	IC	Atlanta, USA	6	O
June 1997	1997 British Wheelchair Rugby Championships	NC	Stoke Mandeville, UK	20	PO
July 1997	Local Wheelchair Rugby Competition	NC	Loughborough, UK	4	PO
Oct 1997	British League Games	NC	Loughborough, UK	4	PO
Nov 1997	1997 Invitation Tournament	NC	Stoke Mandeville, UK	4	PO

Note. IC: international competition; NC: national competition; O: observation; PO: participant observation.

Table 3.4 Participation in Other Disability Sport Classification

Date	Competition	Level	Place	Hour	Position
July 1997	1997 World CP-ISRA Games	IC	Nottingham, UK	15	O
July 1997	1997 International Stoke Mandeville Games (wheelchair basketball)	IC	Stoke Mandeville, UK	10	O
Aug 1998	1998 World Wheelchair Games (wheelchair table tennis)	IC	Stoke Mandeville, UK	30	PO
Oct 1998	World Table Tennis Championships	IC	Paris, France	60	PO

Note. IC: international competition; O: observation; PO: participant observation.

3.2.3 The Developing and Revising Process of the Classification Model

The initial theoretical model guided the later classification studies especially during the fieldwork phase. In the early stages of the project, for example, I participated in the 1996 British Swimming Championships in June and the 1996 Paralympic Games in August. The main elements in the classification model, such as interactions between classifiers and athletes and among classifiers in the classification process, resources used by classifiers in the classification process, and social processes in the interactions, were specifically noted and observed in the competitions. In addition, the context of the swimming classification process was in general understood. The detailed classification process will be described and analysed in Chapter 4.

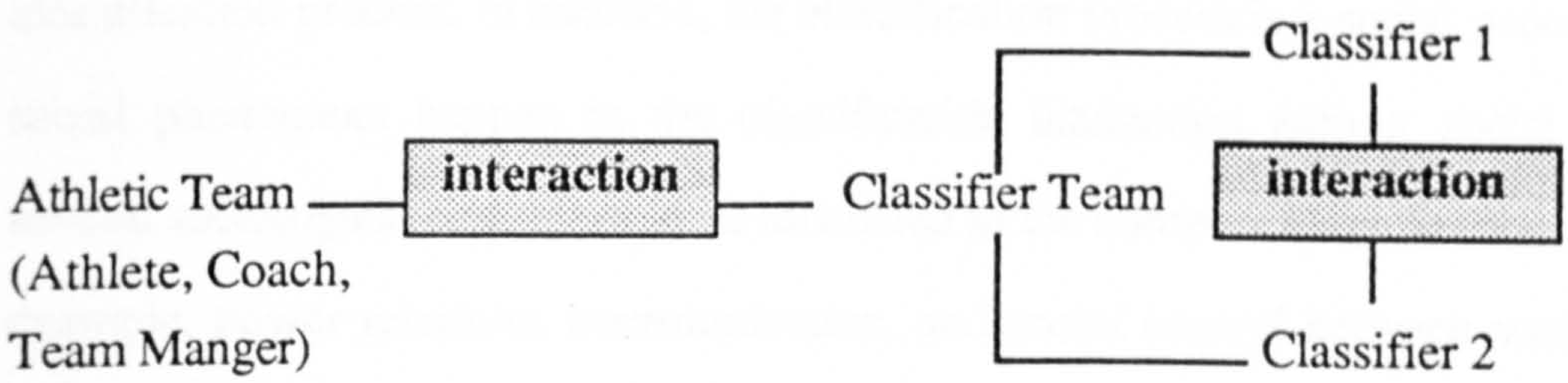
After direct observations of the swimming championships, talking to several authorised swimming classifiers and discussing routinely with other researchers, a number of weaknesses of the original model (see Table 1.1) were exposed. In particular, a few fundamental elements in the model were seen as too simple. For example, the resources in the original classification model were not distinguished clearly. Politics, ethics, history, equipment, economics and psychology were the "factors" influencing the development of classification systems. However, they were not the direct resources used by classifiers or athletes in the classification process and so they were omitted from the revised model. On the other hand, the classification system has been extensively used by classifiers in every competition. Thus, that element was specifically included in the revised model. In addition, using the old classification model, the classification process could not be understood completely and explained clearly so that more detailed concepts were added. The revised model (see Figure 3.1) was developed in November, 1996. It substituted for the original model that was shown in Chapter 1. In the next three chapters of this thesis, the revised model is adopted and refined for empirical studies.

The development and revision of the classification model and process has continued to the present. Attending more national and international swimming competitions and visiting different classification areas, more observation data were collected and more aspects were discovered in the classification process. Even in the same sport but in different classification settings, the classification process and interaction among social actors was not actually the same. Theoretically, it is not until no new information is found that data collection in the participant observation study may stop (Hammersley & Atkinson, 1995). As described in Section 3.2.2, to enlarge the functions of the revised model and avoid limited views developing the model, classification in other sports, such as wheelchair rugby, table tennis, wheelchair basketball, and CP sports, were also observed. I was allowed access to the classification areas and observed or participated in the different classification. Moreover, informal talks with classifiers and athletes took place.

MAIN RESOURCES

Sport Knowledge: movements and skills (functional abilities), functional evaluations.
Medical Knowledge: physical impairments, physical evaluations.
Classification Systems: regulations, procedures, criteria.

PRACTICES



SOCIAL PROCESSES

Power, Communication, Conflict, Control, Allocation of Rewards and Sanctions.

Figure 3.1 Classification Model for Disability Sports

3.2.4 Description of the Classification Model

The revised classification model is developed to explain the complex classification process. When a swimmer or an athlete wants to participate in international competition, he or she needs to be classified and evaluated by authorised classifiers (SAEC-SW, 1998). Classification practices are a series of interactions among social actors. According to my observation in swimming classification, the interactive processes include two main aspects during the classification. First, an athlete and his or her escort interact with the classifier team which may include medical and technical classifiers. Second, members within the classifier team interact together. In the classification process, their interactions among social actors (e.g., athletes and classifiers) follow a lot of social rules and social actors also need to use resources to make the classification process run well. Thus, medical and sport knowledge of classifiers are mainly used and also the classification manual is adopted in the classification process. In addition, the classification process is a social process. Several social phenomena happen in the classification interaction among social actors and several sociological concepts can be identified in the complex classification process. For example, power relations, communication, and social control between social actors of the classification groups can be observed in the actual swimming classification process.

In the next section, several research methods are used to collect data and to clarify elements of the classification model in great detail. For example, main resources such as medical and sport knowledge used by classifiers in the classification process can be identified by participant observation and survey. Effectiveness of the classification system can be evaluated by using the method of document analysis. In addition, using the methods of participant observation and interview to collect data, the classification process as a social process can be examined in depth.

3.3 General Methods

With respect to the research questions, four methods were used to collect empirical data in this project. They were the methods of participant observation, interview, survey and document analysis. Each method will be discussed separately in this section. Generally, some of the methodology which is reported in this chapter is common to several of the studies. However, the specific and detailed procedures of data collection for each empirical study will be reported in the relevant chapters (see Chapters 4, 5 and 6).

3.3.1 The Method of Participant Observation

3.3.1.1 Naturalistic inquiry in the social world

Disability sport is a social world and classification is a social structure within the social world (Giddens, 1984; Shibutani, 1984). To understand and identify problems in the social structure and the social world, for researchers, naturalistic inquiry such as observation is a very useful method to clarify classification problems in greater depth. In the classification study, the most obvious problem is that most researchers neglect or over-simplify the complexity of the classification process. They limit their examinations of classification systems and outcomes so their partial perspectives, of course, do not sort out many of the controversies (see Section 2.9). It is suggested that researchers should participate in the actual classification process to understand what happens in the social interactions of those concerned, to grasp the historical changes in classification, to examine political influences on classification and how the classification system are socially constructed and transformed by social actors. Thus, the topic may be examined in its entirety.

In the participant observation study, the ethnographer (i.e., the researcher) is the main instrument of data collection (Burgess, 1982b; Cuff, Sharrock, & Francis, 1990; Lincoln & Guba, 1985; May, 1993). In an ongoing social process, ethnographers enter the actual social environments and listen, observe and experience the reality to gather data by their active participation in the social world of disability sport. They enter a social universe in which people are already busy interpreting and understanding their environments (Jorgensen, 1989; May, 1993). Giddens (1984) noted:

> the condition of "entry" to this field is getting to know what actors already know, and have to know to "go on" in the daily activities of social life (p. 284).

Hammersley and Atkinson (1995) also pointed out:

> As participant observers we can learn the culture or subculture of the people we are studying. We can come to interpret the world in the same way as they do, and thereby learn to understand their behaviors in a different way to that in which natural scientists set about understanding the behavior of physical phenomena. ... The need to learn the culture of those we are studying is most obvious in the case of societies other than our own (p. 8). ... The value of ethnography as a social research method is founded upon the existence of such variations in cultural patterns across and within societies, and their significance for understanding social processes. Ethnography exploits the capacity that any social actor possesses for learning new cultures, and the objectivity to which this process gives rise (p.9).

In this case, the researcher is no longer an outsider in the research field and he or she does not want to control most variables such as doing experiment in the laboratory which seeks to understand the causalities between limited factors but neglects social meaning (Cuff, Sharrock, & Francis, 1990; Hammersley & Atkinson, 1995; Lincoln & Guba, 1985). Only by means of the process of gathering, interpreting and analysing the participant observation data, the phenomena in the social world become more refined (Denzin, 1989; Lincoln & Guba, 1985).

Doing research on a controversial topic such as disability sport classification has not been an easy task. It was not only difficult to get permission to access the classification areas but to get classifiers and athletes to "open up" to a stranger (i.e., the researcher). Especially, issues of confidentiality were prominent in the classification process. For me, it was also difficult and challenging since little substantive research has been done in this area before. Since there were no precedents to follow, my first task had to be exploratory empirical work in this area. To achieve this, participant observation, in the context of an ethnographic phase of the study, was the most appropriate research method to use. Yorganic (1997), who examined the sensitive topic of sport and sexual harassment, also used the method of participant observation for data collection and exploration of relevant issues. She noted that participant observation would not only provide the researcher with a better understanding of the phenomenon, but would also yield some additional information that other research methods might not provide to the same extent. In particular, participant observation is the only method which provides the opportunity for the researcher to observe the social interaction between classifiers and athletes and understand what happens in the classification process.

There are four possible forms of observation (Adler & Adler, 1994; Fetterman, 1989; Hammersley & Atkinson, 1995; May, 1993). They are (a) complete participant, (b) participant-as-observer, (c) observer-as-participant and (d) complete observer. The use of any role in fieldwork depends mainly on the "relations between and among investigator and research participants and the types of data subsequently generated" (May, 1993, p. 117). In other words, the purpose of the research and the nature of the setting will influence the role of the ethnographer. According to Hammersley and Atkinson who explained the theoretical social roles for fieldwork, the researcher who adopts the roles of complete participant or participant-as-observer, data collection takes the form of comparative involvement and involves subjectivity and sympathy. This involves researchers actually and actively participating in the activities of the social group. Using the roles of observer-as-participant and complete observer, on the other hand, the role of the researcher is more that of comparative detachment involving objectivity and sympathy. There is some distance between researchers and actual social actors in the social settings. In particular, they note that "the complete observer has no contact at all with those he or she is observing" (Hammersley & Atkinson, 1995, p. 107).

To collect more detailed data to describe and explain the classification process, long-term participation in the different classification settings and different disability sports is more appropriate. However, the researcher cannot just stay at classification areas and undertake long-term observations in the classification process without permission or invitation from the IPC sport committees and the coordinators of sport competitions, unless the researcher would like to learn the culture of classification (i.e., try to become a classifier) and help to conduct classification. Disability sport classification is not freely open to the public for observation and usually the classification area is very restrictive for strangers who want to observe classification. Thus, by adopting the roles of the complete participant or participant-as-observer it may be more appropriate to stay at classification sites in order to understand the social environment and interactions among the members of the group and culture of the group. In addition, it is inappropriate that the researcher only plays the role of the complete observer or observer-as-participant in understanding the classification process for a long-term stay at the classification area because classifiers may not treat the researcher as an insider.

Although the researcher may be better adopting a role as a complete participant or participant-as-observer, he or she may face many difficulties before he or she achieves the ideal role. For example, when the researcher starts to participate in disability sport classification, he or she is incompetent as a novice. The researcher needs to spend much time learning many unfamiliar things and then he or she may make sense of a particular social setting. The normal learning process for a novice is watching what other people in the group are doing, asking others to explain what is happening, and trying things out for himself or herself - occasionally making mistakes (Fetterman, 1989; Hammersley & Atkinson, 1995; Lofland & Lofland, 1984). Therefore, the researcher is initially like a complete observer and gradually he or she may be treated like an observer-as-participant. If the researcher progresses well (i.e., knowledgeable in the social group), he or she may be trusted by the members of the group and be offered more opportunities to conduct classification. At this stage, the researcher becomes the participant-as-observer. And finally, the role of the researcher may be fully accepted by the social actors of the group.

3.3.1.2 Participant observation in the classification process

Having decided to use participant observation, principally, I chose to adopt a covert role. However, some senior classifiers and the coordinators of the competitions knew that I helped the classification and also was doing research on classification because I needed to have their permission and get identification cards to access the classification areas. In addition, I needed a "legal" position there (e.g., as a classifier trainee or a learner in classification). In order to have opportunities to participate in classification and also establish good rapport with classifiers, I contacted senior classifiers actively and regularly to ask for information about international or national competitions and also to ask their opinions on classification research and problems. They might have felt that I was eager to learn classification and to increase practical experience. My positive attitude not only earned their trust which made data collection easier, but also if I could conduct classification well and confidently and also have enough classification knowledge and experience, I might become qualified as an international classifier in some disability sports. Generally speaking, most social actors (i.e., classifiers, trainees and athletes) were not fully aware that I was observing their social interactions in the classification process because I was also one of the social actors in the classification group. I did not want them to change their behaviors deliberately because I was observing them. In the initial phase of the observation study, my role was like the observer-as-participant.

When I was allowed to access the classification areas, I learned actively and tried to understand specific sport classification knowledge and evaluation skills and procedures from senior classifiers. This was because I did not want my performance and ability in doing classification to be regarded as poor. Consequently, the coordinators of the competitions or the head classifiers may not have invited me or allowed me to attend future competitions. Fortunately, this situation never happened. Therefore, I could continue attending competitions and undertaking the classification and observation study. With respect to the role of the ethnographer, Hammersley and Atkinson (1995) note:

> In studying the social setting the ethnographer is faced with the difficult task of rapidly acquiring the ability to act competently, which is not always easy even within familiar settings, while simultaneously privately struggling to suspend for analytic purposes precisely those assumptions that must be taken for granted in relations with participants (p. 103).

In addition, I always kept my eyes open like a "sensitive camera" and also listened carefully to the conversations between classifiers and athletes and among classifiers in the classification process. Gradually, I was able to undertake classifications independently and then I was invited regularly by coordinators of sport competitions to do classifications for some national sport championships, especially in swimming and wheelchair rugby classification. Since early 1997, I had no difficulties accessing most national swimming and wheelchair rugby classifications but I continued to be what I was, namely a classifier trainee among other classifiers and classifier trainees. I was simply a classifier trainee who was interested in the classification environment or had an additional role as a researcher. Even later, when I had more classification knowledge and experience, I was still curious and asked classifiers questions which related to classification. At this stage, my role in the settings was like the participant-as-observer or complete participant in swimming classification. Also, most classifiers treated me like a *useful* classifier trainee. They discussed more classification things with me and I in general could respond to their questions or comments quite well.

There are limited opportunities to participate in classification at national and international competitions every year. To collect enough data under the limitation of my research budget and also to identify the classification process in great depth, I decided to conduct long-term studies only in swimming classification. In addition to the long-term studies, the research study was always kept flexible and observation was conducted in different classification settings in order to notice more things happening and understand the different classification contexts in different situations. My role was not rigid and unchangeable. Sometimes I undertook many classifications such as doing the bench test in swimming classification but sometimes I might do more observations because I just assisted other classifiers to record the classification results of athletes or shared my opinions in making a decision on an athlete's classification. When I was in different roles, I could observe classification affairs from different "angles" and "views". However, my behavior, position, and role during the classification process and in the classification field looked similar to those of other classifiers and trainees.

I found that in the observation study immediately writing field notes in the classification areas was always difficult. This was because doing classification evaluations were time-consuming and usually a lot of athletes were waiting for classification before or during competitions. Classifiers needed to do their best to conduct a lot of classifications with only occasional short breaks. Also, I did not want other classifiers to feel my behavior strange and different or find that I often disappeared to do something which they could not see. As a result, I seldom found "free" time and a "safe" space to record the field notes. Finally, a good strategy was discovered to resolve the difficulty. I used Chinese to write down important key words on the small notebook in the classification field during a short break and then wrote the detailed diary when actual classification was finished and classifiers went back to their individual rooms. Those Chinese key words could remind me of my observations. Although I felt tired after conducting a lot of classifications in that day, I always spent one or two hours recalling what happened in the classification process at the same day and also writing the diary in detail in my own room.

Doing the participant observation study, there were some struggles during the research process. According to the code of conduct of classifiers, classification issues and discussion among classifiers should not be inattentively revealed to athletes, coaches, and researchers (SAEC-SW, 1997b). Sometimes the code of conduct made me feel uncomfortable because in my mind I did not have a clear line to distinguish what I should write down in the diary and what I should not do because of confidentiality in classification, although finally I decided to write down everything which I thought necessary and which was helpful to understand the classification context. However, I did not directly write down the real English names of classifiers and athletes into the notes because the field notes may be read by other people. This might have promoted some unnecessary misunderstandings. Being a researcher and a classifier trainee or classifier, therefore, I never revealed classification affairs which may not be nice to other people when I left the classification area. I always noticed that maintaining a neutral position in observation and following the code of conduct of classifiers is one of the important things in this classification study.

3.3.1.3 Analysis of observations

In a study such as this, the analysis of data is not a separate stage of the research. Analysis often "begins in the pre-fieldwork stage, in the formulation and clarification of research problems, and continues through to the process of writing reports, articles, and books" (Hammersley & Atkinson, 1995, p. 205). The analysis of data is not just pure descriptions of the social events and processes. The main purpose of the analysis of observational data is to understand and construct the whole picture of the classification process involving selection and interpretation. A classification theory is then developed or revised out of data analysis. Subsequent data collection is guided by the theory (Glaser & Strauss, 1967; Jorgensen, 1989; Strauss, 1987).

To begin with the analysis of the observation data, the basic concepts and categories were generated and developed (Adler & Adler, 1994; Janesick, 1994; Strauss & Corbin, 1990). It is easier that some concepts help us to make sense of what is going on in the classification process. The first step in the analysis process was a careful reading of the classification manual and my observation diary and fieldnotes (FN).

Thus, some interesting patterns could be identified. For example, what evaluations and tests were routinely conducted in the classification process? Who conducted the classification evaluations? How and why did classifiers conduct them? Who were the social actors in the classification interactions? Since these questions were clarified in the early research stage, the basic classification interactions among social actors in the classification group were made sense of and then more detailed sociological concepts, such as power relations among social actors, social rules in the interactive process, social control among social actors in the social system, and resources used by the social actors in the classification process, were more focused in the analysis and the further observations.

The researcher not only used the observation data to understand the classification process, but also collected amounts of data from other different sources (e.g., interview, survey and secondary data). This triangulated inquiry allowed the researcher to collect more data, consider other evidence and enhance the validity of the study. The researcher then used the "constant comparative method" to identify more concepts and categories grounded from the data (Becker & Geer, 1982; Glaser & Strauss, 1967; May, 1993; Strauss, 1987; Strauss & Corbin, 1990). Hammersley and Atkinson (1995) noted that

> "The aim is to compare and relate what happens at different places and times in order to identify stable features (of people, groups, organization, etc.) that transcend local contexts" (p. 211).

Therefore, the features of the classification process will be identified clearly and the classification theory will be further developed. Even in analysing different contexts, the researcher may then move the substantive theory to the more formal theory composed of abstract categories (May, 1993).

In addition, Lofland and Lofland (1984) reported the use of different analytic "units" for helping the researcher to focus observations and analyse data. For example, "meaning" is one kind of analytic unit and it is the most fundamental aspect of a human social setting. It is "cultural norms and people's definitions of the situation and the variations in the scope of rules in the social scene" (May, 1993, p. 126). Social "practices" are often used for the analysis of observation data. Lofland and Lofland (1984) explained social practices as recurrent categories of talk and action which the researcher may consider have analytic significance. "Episodes" may be considered in the analysis of the data. Episodes relate to the remarkable and dramatic things happening during social interactions. "Roles" can also be units of analyses used to categorise social types of persons and make sense of peoples' activities.

After the analysis of data, the researcher not only produces the theory but also needs to have clear descriptions and explanations of the social interactions (Hammersley & Atkinson, 1995; Robson, 1993). Thus, the entire classification process and related contexts of interactions can be understood more clearly. Consequently, more classification concepts can be identified from the observation research and they then may be applied in the empirical world and other disability sports.

3.3.1.4 Ethical issues in the observation study

Issues related to ethics need to be discussed in this study. This is because the study tries to identify the unknown and unclear parts of the classification process as perceived by the public. Although the study was conducted in the classification fields and behaviours of social actors in the classification group were observed, I adopted a covert position. A few senior classifiers and event coordinators may know that some research was also conducted by me during the competition. They had opportunities to read some proposals and reports which were presented by me. However, they seldom asked for the detailed data and results of the study. In addition, I promised heads of classifier teams that swimmers were not disturbed and also classification and evaluations were not interrupted during the study. If I did not comply, I would be expelled from the list of international classifiers. For me either as a classifier or a researcher, it was a very serious problem if it really happened. It was noticed that doing classification smoothly or correctly was the first priority when I was in the classification team.

As mentioned in Section 3.3.1.2, I did not want social actors or members in the classification group to change their behaviours if they knew that they were being observed. Thus, I adopted a covert position most of time and wrote notes inconspicuously. However, to legally conduct the study, the research proposal and an application form were sent to the Ethics Committee of the Department of PE, Sports Science and Recreation Management. When the study was agreed by the Committee, it was formally conducted. Despite the agreement of the study by the department and university, the researcher understood that any confidential details revealed in the classification process which were shared with classifiers or swimmers should not be passed on to the general public. Keeping confidentiality in classification issues was very important in the study. Thus, they can still trust me as a researcher and also a classifier. They may still invite me to national or international championships as a swimming classifier and a researcher.

In addition, the code of conduct of the classifier was also a useful guideline when I worked as a classifier in the international competition. Thus, I always understood what I should do and what I should not do in terms of the actual classification work and research.

3.3.2 The Method of Interview

3.3.2.1 The interview in classification research

Interviewing is an appropriate research method to "collect rich sources of data on people's experiences, opinions, aspirations and feelings" (May, 1993, p. 90). Cohen and Manion (1994) have claimed that the interview is a kind of conversation and the conversation is for a specific purpose of obtaining research-relevant information.

Generally, researchers ask interviewees questions and try to get their answers or comments. Using this idea in the study of disability sport classification, face-to-face interviews of classifiers and athletes may let researchers understand their feelings and opinions on the classification system, the classification process and some classification issues in some detail.

The use of interviews represents only one method of collecting data in research on disability sport classification. However, the method of interview is often combined with the method of observation or participant observation. Usually when I accessed the actual classification field and if the atmosphere of the classification setting was right, I often curiously asked classifiers or classifier trainees questions to help me understand classification and also identify classification problems which I may or may not know. Most classifiers and trainees were glad to talk to me and share their opinions and experience in classification. The setting for interviews of classifiers was always informal and spontaneous. Sometimes an interview of classifiers just happened because classifiers were waiting for a swimmer in the classification room. I sometimes used the free time (may be just a few minutes) to interview or informally talk to a classifier. However, the interview could be stopped at any time when a swimmer entered the classification room and walked to our classification team.

In addition, most classifiers did not really know my role in the swimming classification field, and may have believed I was merely a classifier trainee. (Later I was authorised as a medical classifier). To avoid their suspicions and maintain their trust I never used the tape recorder during the formal classification process and interviews. Thus, in the long-term study of swimming classification (i.e., two and a half years) I could always keep good relationships with most classifiers and classifier trainees and also conduct a lot of unstructured interviews. Generally, I concentrated on collecting information of classifiers' opinions on the current and previous classification systems and processes and also understanding their classification experience. Unstructured interviewing is complementary to the method of participant observation in the classification research (May, 1993). Many of the data gathered in participant observation comes from the informal interview in the classification field. In other words, observation and interview cannot be individually separated in this study.

Although unstructured interviewing was conducted in the study, questions in interviewing can be categorised as three main themes. First, questions relating to the contents of classification systems were asked and clarified. For example, what did the water test mean in swimming classification? How could classifiers conduct the water test objectively? In addition, questions on the changes of classification systems and historical development of classification systems were also asked. Second, some of the detailed classification processes were understood via interviews. For example, how did classifiers deal with classification protests or appeals? What happened during the classification protest? How did a classifier discuss with other classifiers and then decide the appropriate classes for borderline cases? Is there any difference between general classification and protest in terms of evaluations and the classification process? Third, classifiers' comments on some classification issues were specifically addressed. For example, what did classifiers think of the criterion of "minimal impairments" of swimmers in disability swimming? What did they think about combinations of some specific classes or the reduction of the number of classes? What did they think about swimmers with severe impairments participating in swimming competition? What did they think of the scientific rationale of the functional classification system?

Making detailed notes was the main strategy used to collect the data from interviews in this study. This was because a tape recorder was seldom used during the informal interview. The notes were written as far as possible after each conversation and they were often a mixture of data from participant observation and interview. Names of classifiers who were interviewed were changed in the notes in order to avoid revealing their opinions directly if the notes were read by other people or classifiers. However, some original words which were used to describe things or situations by interviewees may be changed because of the indirect record of data by the researcher. Generally speaking, the contents of conversations between the researcher and the interviewees were understood and then written. Finally, the notes of interviews and observations were summarised. In short, more qualitative information during the classification process was recorded in depth instead of quantitatively measuring behaviors of social actors in the classification group.

3.3.2.2 Analysis of interview

Having the long-term data in interviewing, analysis of interviewing notes (IN) may be separated into the following steps (Cohen & Manion, 1994). First, notes are read repetitively in order to find the general meanings. Second, the general meanings are reduced to units of meaning or categories relevant to the research question (i.e., identification of classification process as a social process in the study). May (1993) notes the first two steps of the analysis of interview as

> The researcher would focus upon the data in order to understand the ways in which people go about their daily lives and compare each interview in this way to see if there are similarities. If replies are similar, then they can be categorized under particular headings such as 'methods of negotiation', which allows the analyst to index the data under topics and headings (p. 105).

The third step is that units of meanings or categories are eliminated to reduce the redundancies of meanings and then the central themes are determined. Fourth, original themes are modified or some themes are added when more interviews are conducted and new data are analysed. Fifth, finding themes which are common to all or most of the interviews and also finding unique themes to a single interview or a minority of the interviews are also crucial. Finally, themes are contextualized in the study so that the classification process can be understood in its entirety.

Generally speaking, interviewing questions for each interviewee may be different in the study. Thus, it is very difficult to compare data in each interviewing note objectively and consistently (Burgess, 1982c). The above procedures which are used to analyse the data of interview are not unchangeable. The process of data analysis is always kept flexible. The main purpose of interviewing is to help the researcher find out about the entire classification process.

In addition, it needs to be recognised that analysis of interviews is not the only way to understand the classification process. A combination of data of participant observation and interview actually may make the study of the classification process more reliable and understandable. The ethnographic study of the swimming classification process relies heavily on both types of data. Using participant observation and interview to collect and analyse data are not mutually exclusive in this study.

3.3.3 The Use of Questionnaire

3.3.3.1 The place of questionnaires in classification studies

The use of questionnaires is also a central part of social research. May (1993) stated that "the purpose of questionnaires is to measure some characteristics or opinion of its respondents" (p. 65). Although the participant observation study is very important in classification research, the survey study is also useful to collect data which cannot be achieved by observation. For example, classifiers play an important role in classification and they are allocated powers to control the classification process. Thus, it will be important to know why and how classifiers can control it. Although it may be assumed that classifiers' characteristics may contribute to social control in disability swimming, this question has not been examined by empirical studies and it also cannot be fully identified just by observation. In this situation, survey and interview are more appropriate methods to collect data to resolve the research questions. For researchers, however, using methods of interview and questionnaire to collect data has some difficulties because authorised classifiers live in different countries and continents. In particular, it is almost impossible to interview most IPC classifiers because it is very time-consuming with high costs. Thus, using the questionnaire for data collection seems to be the most appropriate method in order to understand the characteristics of classifiers. As a result, the classification process controlled by classifiers may be understood in great detail.

3.3.3.2 Construction of the international survey of the international classifiers

Having decided to conduct a survey study, the quality of the survey data (i.e., validity of a survey study) depends heavily on the design of the questionnaire (Cohen & Manion, 1994; Fowler, 1993; May, 1993; Portney & Watkins, 1993). To develop the questionnaire and explore characteristics of classifiers, I used my classification experience gaining from several national and international swimming competitions over one year. A review of the classification manuals in depth was also very helpful for the development of the questionnaire. Generally speaking, to develop a valid questionnaire for achievement of the scientific inquiry, the following ideas were considered in the early stage of development of the survey study.

- Decide research questions;
- Decide variables;
- Decide open and/or closed-ended questions;
- Arrange the order of questions;
- Write an introductory letter to classifiers;
- Think about populations (i.e., authorised classifiers) of the survey study;
- Think about how to obtain lists of authorised classifiers;
- Think about coding variables and data into statistical programmes; and
- Think about how to conduct statistical analyses.

Variables of the empirical study are strongly related to the research question. In the survey study of the international classifiers, for example, identifying characteristics of classifiers and understanding differences between medical and technical classifiers in education, qualifications, classification experience, and classification knowledge are important. Thus, variables such as type of classifiers, the educational field, highest achievement of education, the number of athletes who have been classified by the classifier, how many years that the classifier did classification, self-perceived sport knowledge and medical knowledge of classifiers, were separately constructed. Then, these variables were developed as proper questions. In order to persuade classifiers to complete the questionnaire and enhance the return rate and reliability of the survey, most questions in the survey were designed as close-ended and as simple as possible.

Having developed the first draft of the questionnaire, a pilot study needed to be conducted to pretest the clearance of each question and its meaning. In the next step, the questionnaire was revised and another pilot study was conducted again. It was not until then that a few senior international swimming classifiers who were asked to review the questionnaire understood every question and finally the questionnaire was mailed to every swimming classifier. The general procedures of the survey process are shown in Figure 3.2. The specific and detailed procedures for the survey of international swimming classifiers are reported in Chapter 5 (see Section 5.2) and, specifically, the questionnaire for surveying swimming classifiers is presented in Appendix B. In addition, data analysis and statistics of the survey study are reported in Chapter 5 in detail.

3.3.3.3 Reducing the weaknesses of the survey study

Despite the importance of the survey study mentioned in the above section, in particular, two critical problems in the survey study should not be neglected. First, the structured survey may lose a lot of related information that cannot be collected by the pen and paper test. In other words, a lot of contextual-related information cannot be identified and understood in the survey study. Second, quantitative data of the survey study may not represent the whole social process. Sometimes fragmented results do not assist readers in making sense of the group and developing the entire view (Bryman, 1988; Marshall & Roseman, 1995). To reduce the bias and improve the weaknesses of the survey study, a combination of other research methods is emphasized in the thesis in particular. As mentioned before, methods of participant observation and interview help the researcher to collect the empirical data that may not be obtained by use of the questionnaire. In Chapter 5, the combination of methods of survey and observation to identify the characteristics of classifiers and discuss social control of classifiers in disability sport classification will be reported in more detail.

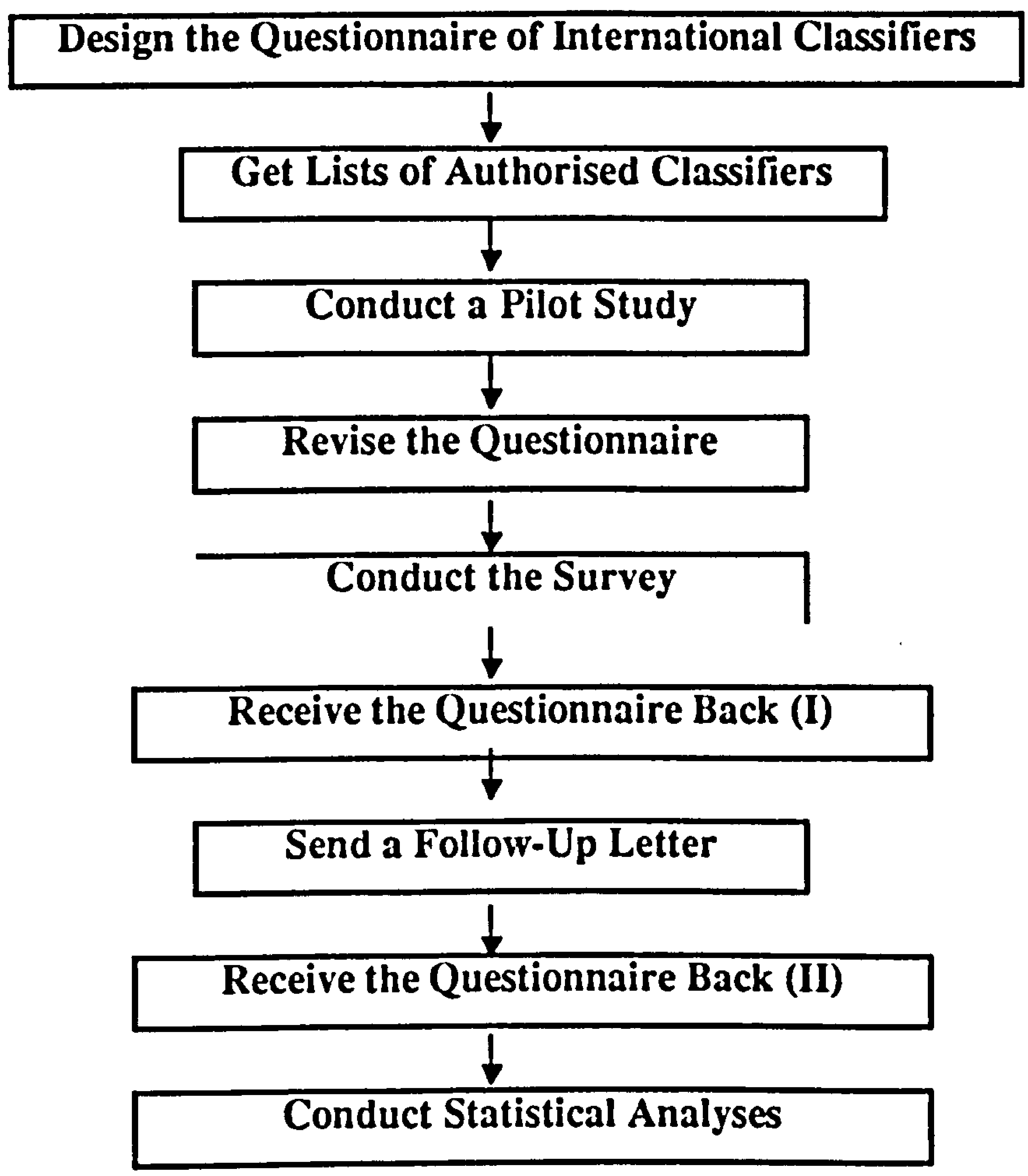


Figure 3.2 Schematic Procedures of the Survey Process of the International Classifiers

3.3.4 Document Analysis

Principally, researchers tend to collect primary data to answer research questions. In many situations it is difficult to collect primary data (i.e., collect data from athletes or classifiers directly) when doing classification studies. Thus, an analysis of secondary data, such as official publications in the international competitions and classification manuals, can provide a lot of useful information for researchers in order to evaluate the effectiveness of classification systems and understand contents of classification systems. Although an analysis of secondary data may not be the best method to conduct classification research, the functions of the method should not be neglected.

3.3.4.1 Analysis of official publications

Analysis of official publications is a popular and useful method in the social study. For example, official publications and statistics often cover the economy, crime, employment, education and health. The material which is collected on a routine basis by the government and authorised agencies provides a rich source of data for social researchers to analyse (May, 1993). In able-bodied sport, an analysis of previous sport and world records is often used to predict the performance and potential of athletes, to set up training programmes for athletes, and even to adjust sport rules. In disability sport classification research, the method has been used in athletics and swimming for a few times, such as studies of Coutts and Schutz (1988), Higgs et al. (1990), Gehlsen and Karpuk (1992), and Chappel (1994), and a series of swimming classification reports from Green (1994, 1995a, 1995b, 1996, 1997a). These classification studies focus on collecting the official data such as performances, classes or types of impairments of athletes, and statistically analysing these data to evaluate the effectiveness of the classification systems. Specifically, the study of Higgs et al. (1990)

in athletics classification and a series of reports in swimming classification and impairment from Green (1994, 1995a, 1995b, 1996, 1997a) can be seen to help the revision of athletics and swimming classification systems. The results of their research have been taken into account seriously by IPC sport-specific committees. However, there are no documented analytical studies that have combined the analysis of classes, impairments and performances of athletes simultaneously. Perhaps the data of impairment of athletes are not available from official publications and they are confidential. To obtain and use the data of impairments of athletes, therefore, researchers need to apply to the IPC sport committee and its classification and sport science subcommittees and receive their permission.

Despite the difficulty of data collection, there are several advantages in analysing the official publications and data for classification research. First, the document analysis study is easier to handle and researchers may use it to examine the classification outcomes more objectively. Second, data in this kind of study usually cover a large sample size so that the bias of the sampling can be avoided or reduced. Third, the cost of the study may be smaller than other methods of data collection such as participant observation and interview, although there are a huge amount of data needing to be keyed in computer files and analysed. Fourth, this kind of classification study can be replicated in most international competitions so that the effectiveness of classification systems can be longitudinally monitored. Fifth, data can be stored in computer and complicated statistical analyses and procedures can be programmed. Thus, it is convenient for data analysis in future studies and also for comparisons of results of those studies under the standardized research method.

On the other hand, there is a big limitation using an analysis of official publications in the classification research. That is, the secondary data may not help the researcher to directly understand the natural and empirical classification process and identify the actual problems in the classification process. This issue was discussed in the Section 3.3.1. Thus, it will be better that researchers adopt different research methods and combine quantitative and qualitative approaches to investigate different classification issues. Specifically, this idea guides the researcher to collect data and examine several swimming classification issues in great depth in this project.

As mentioned earlier, I was allowed to participate in the 1996 Paralympic Games as a swimming classifier trainee. At that time, I not only participated and observed the swimming classification, but also had an opportunity to collect the performance data of swimmers from the Atlanta Paralympic Organization Committee (APOC) and collect the impairment data of swimmers from the IPC Sports Assembly Executive Committee for Swimming (SAEC-SW). Thankfully, I had the full support of the chairperson of SAEC-SW to collect some confidential data because data of impairments of swimmers were not available to the public except the chairperson of SAEC-SW and its classification subcommittee. The detailed procedures for data collection and analyses of swimming classification outcomes are reported in Chapter 6.

3.3.4.2 Classification manual

Classification manuals are the products of classifiers, researchers and athletes who discuss and share knowledge and experience. The classification manuals are also an important source for classification research. Reviewing and analysing the current and previous classification manuals can help researchers to understand classification systems, contents and rules in more detail, to grasp changes of classification systems, and to establish some practical concepts and classification knowledge. In particular, at present, different sports have different needs in classification. Analyses of classification manuals in different sports and in previous periods can help researchers to understand the characteristics of different classification systems. In this research project, swimming classification is systematically investigated. Thus, thorough analyses and comparisons of the 1988, 1992, 1994 and 1998 swimming classification systems are necessary, especially in understanding the medical and sport related contents. The basic contents of the swimming classification systems are conceptualised into several themes such as integration, evaluations, the classification process, and sport-specific information, and also their similarities and differences among the four systems are listed. The detailed information and comparisons will be reported in Chapter 7.

Analysing classification manuals, however, cannot fully provide researchers the real classification experience and let them understand what happens in the classification process in great depth. Thus, again it is necessary that researchers go to the classification places and directly observe or participate in the actual classification process. Combinations of this method with other research methods such as participant observation, interview, and survey in the classification research, can provide researchers with more clear information and views in order to clarify the complexity of the classification process.

3.4 Concluding Remarks

Without a systematically developed theoretical framework as the groundwork, a research study will at best be conducted fragmentarily and without a clear direction. In the chapter, the development of the classification model was reported and later the original model was revised because it could not fit the actual classification situations and the social world very well. The revised theoretical model will be used as a basic map to guide the research direction and empirical studies in the project. However, it is recognised that the revised model is not perfect. More developments and revisions of the model will be progressively continuous because the actual classification process is reproduced and transformed by social actors, and then detailed social processes may be identified more and more by researchers.

In addition, collecting valid data to answer research questions is the main purpose of the study. It depends heavily on the use of appropriate research methods. The research approaches that can be used to collect data and to examine broad classification issues can be generally categorised into five methods. They are participant observation, interview, the use of questionnaire, document analysis, and experiment. In sociological study, experiments under laboratory situations and artificial controls are seldom conducted. Thus, the method of experiment is not discussed in the thesis. On the other hand, participant observation is the main method of the study so that it was discussed in great detail.

Later, three research topics (a) the swimming classification process as a social process, (b) the characteristics of swimming classifiers and social control in disability swimming, and (c) performance outcomes of the swimming classification system will be investigated in this thesis, respectively. Several research methods which may be used to collect data to identify those topics are summarised in Table 3.5. However, some methods may not be used to obtain information for each topic because of the limitations of time, research funds, availability of facility, access of classification areas, and so on. Concerning with the difficulties of the research process, the most appropriate and useful methods used in the project are presented in Table 3.5. Generally speaking, combinations of quantitative and qualitative approaches are adopted in the thesis. With respect to the detailed research procedures, they will be reported in each relevant chapter. In the next chapter, I start to discuss the first empirical study, that is, exploration of the swimming classification process as a social process. Participant observation and interviews are the main methods used for data collection.

Table 3.5 Summary Table of Research Methods for Obtaining Information

	Method				
Kinds of information	PO	I	Q	DA	E
1. Classification process	√√*	√√*	√	√	
2. Characteristics of classifiers	√*	√	√√*	√	
3. Outcomes of classification	√	√	√	√√*	√√

Note. PO: Participant Observation; I: Interview; Q: Questionnaire; DA: Document Analysis; E: Experiment.

√√: most efficient means; √: supportive means.

*The method is used to obtain data in the study.

CHAPTER 4

SWIMMING CLASSIFICATION AS A SOCIAL PROCESS

4.1 Introduction

Classification in disability sports is a social process. With regard to the fairness and equity of competitions for athletes with physical impairments, some of the issues related to the process of classification for disability sports need to be clarified and investigated. In the development of disability sport classification, most research studies of classification have focused on the classification systems and outcomes (e.g., Brasile, 1990a; Brasile & Hedrick, 1996; Chappel, 1994; McCann, 1994a; Vanlandewijck, Spaepen, & Lysens, 1994, 1995) . In other words, most researchers have investigated the products of classification. Conversely, there is little research currently that investigates and clarifies the classification process. Several controversial problems in classification have been presented and discussed in a few published articles. For example, who should dominate the classification process (Craven, 1990; Strohkendl, 1986)? What kind of the classification process is better for athletes and also for the development of disability sports and fairness of competition (Riding, 1994; Steadward, 1996)? Although the problems of fairness in classification systems have often been challenged, they have seldom been discussed in depth especially using different perspectives. These problems in classification are not only in the systems but also in the processes and interactions between classifiers and athletes with impairments. Thus, it is necessary to use adequate research methods to investigate problems in the classification process, as well as to understand, analyse and interpret the classification process in detail.

Generally speaking, in previous decades (from the mid-1950s to the late-1980s), medical-based classification systems have been used in disability sports and the classification process has been controlled and dominated by medical classifiers (most of whom are medical doctors) (Craven, 1990; McCann, 1984). Other groups have not been able to present their opinions regarding classification systems or have not had a significant influence to change the rigid medical classification systems even when they have different ideas. However, the fair/unfair problems in classification have often been noticed and have been challenged both by researchers and athletes with physical impairments, when different types of physical impairments have been integrated in recent competitions (McCann, Davis & Richter, 1994; Richter, et al., 1992).

The player classification system for wheelchair basketball is an example of a successful practice and most wheelchair basketball players accept the functional-approached system (Strohkendl, 1986, 1996; Vanlandewijck & Chappel, 1996). This example has stimulated other disability sports to develop a sport-specific classification system. Using this functional system in wheelchair basketball, the players have been empowered (Craven, 1990). They understand the classification system and play a central role in the classification process. This radical change in classification has become a major trend for many disability sports. There is no doubt that medical classifiers cannot totally control all the classification processes at present because technical classifiers and athletes also play unique and important roles in the process.

Although functional classification has been accepted and used widely since the 1992 Paralympic Games, it has only been developed and tested for a few years. Thus, researchers have found a lot of controversial problems in the functional classification systems (McCann, 1994a, 1994b) and the classification process (Williamson, 1997). It is predictable that the developing phase of the functional classification systems will have some problems and will definitely be challenged (Riding, 1994). However, if the changes are positive in promoting and developing disability sports, most athletes with physical impairments will be glad to accept it. We should therefore spend much energy providing scientific data to support it and trying to improve it if any problems have been found out in the system. The ideal aim of the development of sport-specific classification is to establish the fairest system with the clearest classification process as far as possible.

The aim of this chapter is to identify the classification process in disability sport as a social process and also to discuss related problems in the process. The discussion is separated into two main parts. First, using disability swimming as an example, the classification processes and procedures between swimmers with physical impairments, medical classifiers and technical classifiers are described and reported. Second, several features in the swimming classification process are interpreted, discussed and conceptualized.

4.2 Method

Two research methods were used to examine classification as a social process. First, participant observation was conducted at several national and international swimming events (see Table 3.2). The researcher participated in four national Championships and six international swimming Championships and spent approximately 40 and 330 hours respectively in those events. Generally speaking, in the national Championships (i.e., British Swimming Championships) two or three authorised swimming classifiers were invited to undertake classifications. Two classifier trainees usually helped those classifiers. In the international events the number of swimming classifiers varies depending mainly on the number of swimmers who needed to be classified and the strength and level of the competitions. For example, there were eight or more authorised classifiers who were invited for the 1996 Paralympic Games, 1997 European Championships and 1998 World Championships because over 300 swimmers participated in those highly competitive events. However, there were only two international classifiers at the 1997 International Stoke Mandeville

Games because only about 40 swimmers needed to be classified and the competition was mainly organised for developing swimmers.

Second, interviews were used to compliment the method of participant observation in the study. About 30 informal and unstructured interviews of classifiers were conducted during the national or international championships. The duration of interviews may be only a few minutes to 20 minutes. However, two authorised classifiers were interviewed in depth and one classifier agreed that our conversation can be tape-recorded.

4.2.1 Participant Observation in Swimming Classification

Before the study, the researcher spent a lot of time reading the classification manual to understand the functional classification system for swimming. In addition, classification articles in disability sports were reviewed to establish general classification ideas and the state of current knowledge. During the early stage of the observation study in swimming classification (i.e., in the early and middle 1996), the researcher spent several hours on learning swimming classification knowledge and making sense of the general swimming classification procedures and also emphasized on understanding the main culture of the classifier group. Also, an important way to understand theoretical and practical swimming classification was to attend the international swimming classification seminars which were conducted by a few senior classifiers.

To thoroughly examine the research questions and collect data in different classification settings, the researcher participated in several international events. In particular, the Paralympic Games and World Championships were the highest level of competitions in disability swimming and so classifiers conducted classification there with great care. Thus, more episodes were observed in the classification process. To collect more data at the Paralympic Games, the researcher asked the chairperson of SAEC-SW to use a video or audio recorder to record the interactive processes between swimmers and classifier teams during swimming classification. However, the proposal was rejected because classification was a confidential issue. Nobody could reveal the detailed contents of the classification process at the Paralympic Games (Atlanta Paralympic Organising Committee, 1996). Therefore, making field notes was the most appropriate way to record what happened in the swimming classification process.

During the process of observation at the national or international swimming classification, interactive processes between swimmers and classifier teams and among classifiers were noted in particular. The researcher was particularly interested in observing people's behaviour and listening to their conversation, discussions and opinions concerning the swimming classification process. Any routine behaviours and uncommon things which happened in the classification process were noted.

From 1996 to the mid-1997, the researcher was gradually familiar with most of the classification process. However, the researcher was prevented from observing or participating in two specific but important events. They were (a) observation of an appeal or a protest of classification and (b) participation in the authorised classifiers' meeting. The reason the researcher could not have access to those events was that his status in the classification group was not considered high enough at that time (i.e., as a classifier trainee not an authorised classifier).

After participating in several national and international swimming competitions and classification, the researcher was qualified as an authorised medical classifier in August 1997. Since then, the researcher experienced fewer limitations to participate in most classification processes even an appeal and a protest of classification and the classifiers' meeting. Participation in those two activities allow the researcher the opportunity to observe differences which could not be seen in the general classification process. In addition, the researcher was able to provide direct feedback for improvements of the classification system, also ask more detailed questions to some senior classifiers, and deal with more things that happened in the classification process. Even a few senior classifiers could provide the researcher with some old documents which were related to the development of the functional classification system.

The observation study was stopped when the researcher could not find more new things happening in the classification process. As a result, it was thought that the observation data, in general, had saturated (Glaser & Strauss, 1967). In other words, there were no unusual situations in the process that were found in the last national and international classification. In the participant observation study, data collection was stopped after the 1998 World Swimming Championships. The entire study took the researcher over two and a half years in different national or international classification fields. Generally, a serial of questions guided the researcher to conduct observation and collect data (see Appendix C). A lot of fieldnotes (FN) and diary observation were written to reflect the actual classification process in swimming which the researcher had experienced, heard and seen.

4.2.2 Interviews of Authorised Classifiers

Interviewing authorised classifiers is also a useful method for data collection in the study. This is because only a few authorised classifiers had understood the detailed swimming process, had participated in the historical development and revision of the functional classification system, and had their own opinions in interpreting the classification system and process. Interviews were conducted to collect the information which could not be gathered by participant observation.

When conducting interviews in this study, two main difficulties have been found. First, authorised classifiers lived in different countries so that it was impossible to travel to different countries to interview most of the classifiers. However, it was possible for classifiers to be interviewed during the national or international championships if some of international classifiers participated in them. Actually, the idea had been tried several times and it was not successful. For example, some classifiers agreed to be interviewed before the competitions. However, during the competitions they were too busy to let the researcher interview them. Thus, strategies for interviews needed to be adjusted. The researcher decided to ask classifiers a few questions each time when they had free time. The conversations between the researcher and classifiers were not formal and usually lasted less than 20 minutes. The fragmented data were finally put together and reorganised into a complete picture. Gradually, those data were very useful for the researcher to understand and reflect on the classification process in greater depth.

Another problem which the researcher had during the data collection was the method for recording data. Generally, one of the traditional but the most appropriate methods to record conversations is to use the tape recorder. Using the tape recorder in this study, however, may affect trust between the researcher and classifiers. Thus, another option to record data is to write notes after each conversation with classifiers. Finally, interviewing data were collected for some 30 informal and short interviewing notes (IN) over a two year period. In total about 50 pages of the A4 size of the data were written. In addition, two in-depth interviews were conducted early in 1998 because two authorised classifiers lived in England. One classifier agreed that our conservation could be recorded. However, the other interview just used the method of making notes after the interview was conducted.

Generally, interviews of classifiers included several questions and themes in swimming classification. They were "developmental processes of functional classification systems", "description and interpretation of specific classification processes" (with which the researcher may not be familiar), "what differences between the current classification system and the 1988 and 1992 swimming classification systems", "how and why the classification systems were changed", "similarities and differences in classification processes when the new and old classification systems were used in swimming", "personal experience and opinions of classifiers in classification", and "any comments such as strengths, weaknesses and problems on the previous and current classification systems". The analysis of data collected from observation and interviews is reported in Chapter 3 and Appendix D.

4.3 Classification Setting

4.3.1 Physical Settings of Swimming Classification

Generally, swimming classification was conducted in two important places- the classification room and the swimming pool. However, the classification room was seldom near the important and obvious area in the swimming pool. Usually there were some small signs pointing out the classification room before the swimming competition started. Sport coordinators seldom forgot the important place because all swimmers needed to be classified and allocated international classes so that they are allowed to attend international swimming competitions. A common classification room was supplied with tables, chairs and benches. The size of the room never exceeded 20 metres in length and 10 metres in width. Usually a classification room could be divided into two or three classification areas and some space for administration and classification registrations of swimmers. In each classification area there was a specific bench for classifiers to conduct medical evaluations but the size of the area might be about three metres in length and two metres in width. Each classification area was separated by some pieces of movable curtain. Generally speaking, physical abilities of swimmers needed to be evaluated by medical classifiers in the small area.

In addition, to conduct appropriate swimming classification, evaluations of swimmers' functional abilities are very important. Thus, a swimming lane in a training pool or the formal competitive pool was always reserved for use in classification. Usually sport coordinators left the closest lane to the pool side (i.e., lane 1 or 8) for the purpose of classification. If other swimmers swam into the classification lane without the permission of classifiers or sport coordinators, they would be asked or commanded to leave it or move to other lanes when classifiers needed to use it. In addition, swimmers might be asked to demonstrate their ability to dive (i.e., starting from the starting block) so the starting block of the swimming lane needed to be kept safe and dry.

Observation during swimming competition is unavoidable if classifiers are to confirm swimmers' classes. Thus, several seats (about 10 or more) in the spectator area were reserved for classifiers and trainees for the purpose of observation. In the international competition those seats were always located at the middle area. Classifiers could therefore have a good view of the competition without restrictions. It was important that other people did not sit in the area when needed by classifiers. If spectators, swimmers or coaches sat in that area, they were asked to leave.

During the Paralympic Games and World Championships, the organisers also arranged meeting rooms specifically for classifiers. This allowed classifiers and trainees to discuss confidential issues without being overheard. Usually a sign "jury room" was put outside of the room. When classifiers held discussions or took a rest at the room, they were seldom disturbed by other people.

4.3.2 Social Actors in the Classification Settings

In the above classification settings, members in the classification group including medical classifiers, technical classifiers, classifier trainees, swimmers, coaches, and translators interacted together. Medical and technical classifiers and swimmers all played important roles in the social interactions of classification. Mainly medical classifiers needed to conduct the physical evaluation for swimmers, and technical classifiers dominated the functional evaluation of swimmers (i.e., water test). Although classifier trainees, coaches, or translators might play essential roles in the swimming classification process, their roles might be regarded as secondary compared to the medical and technical classifiers and swimmers,. In other words, if there were only classifier trainees, coaches and translators without classifiers and swimmers, the formal classification interactions would not happen and classification would be constructed in other ways.

Generally, the classification process could be said to operate when members in two main groups interacting together. Those two groups were *the classifier team* and *athlete team*. The classifier team must consist of at least one medical classifier and one technical classifier. It might sometimes include some classifier trainees. The athlete team included a swimmer and one escort who may be a coach, team manager or translator. In addition to the interaction between the members of the two groups, a series of interactions took place within the groups during the swimming classification process. In particular, medical and technical classifiers needed to interact and collaborate together. Therefore, to discuss the dynamic relations among the social actors, both intergroup and intragroup interactions needed to be identified and discussed.

Members in the classification group can be recognised by some characteristics. For example, the authorised classifiers usually wore the uniform which was given by the sport organising committee, they might have a classifier badge which was given by IPC and SAEC-SW and their identification card might print their status in the competition as classifiers. In particular, the classifier's badge represented the symbol of the authority. However, medical classifiers and technical classifiers could not be directly identified except that medical classifiers might bring some classification kits such as a goniometer, ruler, and reflex hammer. Classifier trainees, however, did not have any fixed symbols such as an uniform or a badge to reveal their authoritative status. In a few international events the organisers might give uniforms to classifier trainees. "Classifier" or "classifier trainee" labeled identification cards might be worn by classifier trainees.

It may be easier to identify swimmers, coaches and team managers. Usually in the identification card of a swimming competition their status was printed clearly. In addition, they might wear the sporting uniforms which had the names of their countries. Swimmers with impairments might even be recognised from some features of their physical bodies, such as the deformities of their limbs, using wheelchair, crutches, prosthesis or adapted tools.

4.4 Interactions in the Swimming Classification Process

In disability swimming, currently the functional classification system is used to evaluate swimmers with physical impairments (SAEC-SW, 1998). Generally speaking, medical classifiers and technical classifiers work together to evaluate the physical and functional abilities of swimmers respectively. Swimmers may then be assigned to classes according to their physical and functional scores, disability and practical profiles, and the quality of movements which they perform in the classification process and testing items. According to the classification regulations (SAEC-SW, 1998), if swimmers attend freestyle, backstroke or butterfly competitions, they should have S classes; if swimmers attend breaststroke competitions, they should have SB classes; and if swimmers attend medley competitions, they should have SM classes.

The swimming classification process is an interactive process between swimmers and classifier teams and among medical and technical classifiers. There are three main interactions in the swimming classification process. They are: (a) swimmers and medical classifiers; (b) swimmers and technical classifiers; and (c) medical and technical classifiers. However, the classification process is very complicated so that those three types of interactions cannot be explained directly. To clearly understand the whole process, it may be better that classification procedures are separated into several stages with each stage being described and explained in detail. In this section common swimming classification procedures are presented as the following. They are (a) registration for classification and introductions among social actors, (b) bench test and physical evaluations, (c) water test and functional evaluations, (d) discussion among members of the classifier team, (e) explanation of classification results, (f) classification appeal, (g) observation during the competition, (h) classification protest, and (i) meetings of classifiers.

4.4.1 Registration for Classification and Introductions among Social Actors

The classification order of swimmers was arranged by the head classifier or the technical delegate (TD) before the entire classification in a competition was conducted. Sport coordinators usually gave the classification time table to each team in the manager meeting or put it on the pigeon-hole of each country before the swimming championships started. The classification order relied mainly on the arrival time of each country or team to the host city or country and the number of swimmers who needed to be classified before the competition.

Although the classification order was set beforehand, delay of classification sometimes occurred. This might be explained by the circumstances of swimmers or classifiers. The late arrival of swimmers to the classification room was one of the main reasons causing delays. Some swimmers claimed that they did not know the time schedule for classification when classifiers asked them why they came to the classification room so late (FN, 13/8/96, PG) [1].

In addition, classifiers may affect the classification schedule. In particular, the classifier teams may spend too much time classifying a few *difficult* cases. The situation which was often seen when classifiers evaluated (a) swimmers in borderline classes, (b) swimmers with CP and (c) swimmers who did not understand English and no translators were available to help (IN, 20/8/96, PG). Thus, other swimmers who were waiting for classification needed to sit outside the classification room and waited longer (FN, 4/8/97, ESC). When any classifier team was ready for the next classification, a classifier usually opened the classification room to call the name of the swimmer and then the swimmer was allowed to enter the classification room. If the classification schedule was delayed because of classifiers, they seldom explained the reasons why swimmers needed to wait longer.

[1] Citation of data of fieldnotes or interviewing notes is used as follows. FN means field notes and IN means interviewing notes. 13/8/96 means the date of collection of data. PG means the Paralympic Games, ESC means the European Swimming Championships, WSC means the World Swimming Championships, and BSC means the British Swimming Championships.

The first stage of swimming classification processes- "registration for classification and social actors starting to meet each other" could also be divided into several procedures. When the swimmer was called to enter the classification room by classifiers, it indicated that the swimmer has been registered for classification spontaneously. Otherwise, the team manager needed to check the list of swimmers for classification. Generally, the first procedure was a quiet interaction. That was eye-to-eye contact between the swimmer and classifiers. In particular, when the swimmer entered the classification room, he or she was guided by a classifier or trainee to a specific bench and at the same time he or she was observed by the medical and technical classifiers. The purpose of the observation was to provide several ideas and basic pictures regarding the swimmer's characteristics and functions in order to help the classifiers evaluate the swimmer later. Therefore, some movements such as gait patterns and styles, walking independently or not, using aids or using a wheelchair, were noticed by classifiers.

The next procedure was a formal interaction among the members of the classification group. That was when the swimmer, medical classifier and technical classifier began to interact by introducing each other and talking generally. At the same time, the medical classifier asked questions regarding the basic information of the swimmer such as name, country, gender, type of impairments/disabilities, date of birth, training conditions, and so on. The technical classifier recorded the answers given by the swimmer. If the swimmer did not understand English, a translator, if available, might help. Some classifiers may speak different languages. They may directly speak the language which the swimmer understood and so they could communicate with the swimmer better. After the basic information has been completed, classifiers asked the swimmer to wear only the swimming suit. Then, a few classifiers may explain the general procedures for classification (FN, 1/6/96, BSC). They included two important tests: (a) bench test for evaluation of physical abilities and (b) water test for evaluation of functional abilities.

4.4.2 Bench Test and Physical Evaluations

In the classification process, the main purpose of the interactions between swimmers and medical classifiers was that medical classifiers attempted to find out the swimmers' physical abilities and disabilities clearly. Then, medical classifiers assigned *quantitative* scores to represent the physical abilities and disabilities of swimmers according to their physical functions, such as muscle strength, range of motion of joints, coordination of movements, muscle spasticity, limb length, and so on. When the evaluation of medical classification was finished, generally, swimmers might be classified to a "rough" class using the total scores. The whole medical classification process could be separated into different consequences and procedures and be described step by step.

In the medical evaluation of the classification process, first of all, the medical classifier required the swimmer to follow his or her instructions to perform tests of physical functions and movements in upper extremities, trunk and lower extremities on the bench. Usually medical classifiers explained these movements and demonstrated them, and then the swimmer did his or her best to perform them. If the swimmer still did not understand how to do the test movements, the medical classifier demonstrated them repeatedly. When the swimmer followed the classifier's instructions, the medical classifier and technical classifier observed the movements together and then the medical classifier gave points under classification rules to indicate the ability and the levels of quality of motor functions. Because swimmers with different physical impairments showed different physical characteristics, different testing items were selected depending largely on the physical problems and diagnoses of the swimmers. For example, in general manual muscle testing was routinely used to evaluate the muscle strength of swimmers with spinal cord injuries, poliomyelitis or muscular dystrophy; measuring the length of the impaired limb was used to evaluate the swimmers with amputations or dysmelia; coordination testing was used for swimmers with cerebral palsy or head injury; and measuring the range of motion of joints was used for swimmers with muscle contractures or movement limitations of joints such as arthrogryposis.

In an actual evaluation, for example, the medical classifier asked the swimmer with SCI to lie down on a bench. Then, part of the whole physical evaluation was reported as the following.

> "Please bend your right elbow" the classifier said, "and hold here". The classifier resisted the movement performed by the swimmer. "It is five" that indicated the strength of right elbow flexor was *normal*. The technical classifier then wrote down 5 on the classification sheet. "Straighten your elbow like I do" the classifier demonstrated it, "and hold here". Again the swimmer followed the classifier's instruction to do it and the classifier felt the resistance of the movement. "It is four" indicating the strength of right elbow extensor was *good* (FN, 12/8/96, PG).

A similar routine evaluation was conducted for each muscle of the whole body (i.e., upper extremities, trunk and lower extremities) which was written on the classification sheet. Sometimes the medical classifier asked the swimmer directly "do you have any problems in your arms". If the swimmer said "no", the medical classifier quickly performed some simple tests to screen selected arm muscles because the medical classifier did not want to waste time and energy to check every muscle in the upper extremities.

The interaction between medical classifiers and swimmers in bench tests was dominated by medical classifiers. Generally, medical classifiers talked to swimmers more and then swimmers answered their questions. Most swimmers seldom actively talked to classifiers during the process of physical evaluations.

When the medical classifier evaluated the physical abilities of the swimmer, the technical classifier wrote down the testing result into each testing item. It was unusual for the technical classifier to directly disagree or challenge the test result of the medical classifier during medical evaluations. The technical classifier might gesture with hand or head to show disagreement or directly talk to the medical classifier that he or she disliked the decision. If it happened, the medical classifier might repeat the test of that item again or even invite the technical classifier to do the test or feel the movement instead of just observing. However, if the medical classifier allowed the classifier trainee to do the bench test and some mistakes were found during evaluations, some medical or technical classifiers might directly tell the trainee that he or she made mistakes. Sometimes some classifiers might "correct" medical evaluations of trainees in the presence of the swimmer.

Although it was quite right to record a point for each muscle or movement in detail, finishing the total physical evaluation could take a long time. For example, a swimmer with connective issue problems was classified in an international championship (FN, 13/8/96, PG). Her muscle strengths were not even and the classifier team spent about an hour checking each muscle to complete the bench test. The swimmer was asked to lie down "on your tummy", then "side-lying", then "could you stand", and sometimes return to the lying down position. After about 30 minutes of tests the swimmer just looked tired and bored from changing positions and doing movements for reasons not fully understood. However, the swimmer could not just jump away and reject classification because of being tired.

In particular, if swimmers completely collaborated with the classifier team, they did their best to perform every movement required. The phenomenon of "fatigue" could be seen from swimmers' behaviours and movements after a few minutes. This situation often happened in classifying swimmers with CP. After five or ten minutes of the bench test for CP swimmers, some swimmers were exhausted, lay down on the bench and breathed heavily. Their facial expressions were also telling classifiers- "Please stop the tests and let me take a rest". A few classifiers noticed it and allowed swimmers to take a break for a few minutes (FN, 4/8/97, ESC). Some classifiers still continued the tests because that they did not notice the fatigue or time was quite short for classification (FN, 13/8/96, PG).

After finishing the physical evaluations, classifiers started to calculate the total points in each part of body. It included right and left sides of upper extremities, trunk and lower extremities. Then, classifiers wrote down the score for each part on the classification sheet. In addition, a total point count was made to show the abilities of the swimmer in terms of bench test. The score was used to briefly estimate the swimmer's class except for those with very clear and standard characteristics of physical impairments. Swimmers such as with single limb amputation can be correctly classified by the medical evaluation without more functional evaluations and water tests. Generally speaking, many swimmers with amputations or dysmelia matched the above criterion because characteristics of their physical disability were fixed and stable. If the classifier team had any suspicion about the swimmer's functional abilities, the swimmer was asked to do the water test. For swimmers with SCI, CP, polio, les autres (except dwarf), they were usually asked to do water test. Thus, their functional abilities could be actually identified by the classifier team.

The evaluation score in the bench test acted as a reference in swimming classification. For example, the bench score of a swimmer with CP was 170 points in S event. According to the point range of each class in the swimming classification system, he or she should be classified to class 6. However, the classifier team guessed that the swimmer may be in class 5, 6 or 7 (FN, 5/8/97, ESC). Generally, a higher possibility that the swimmer was class 6 was indicated. It could be decided only by finishing the water test and discussing the performance among the members of the classifier team.

4.4.3 Water Test and Functional Evaluations

When the medical classification process had been completed, functional classification began. The main interactions in functional classification were between the swimmer and technical classifiers and among technical and medical classifiers. This stage could also be divided into several procedures. Generally speaking, the technical classifier dominated the water test although other members might also play important roles.

First, the technical classifier simply explained the evaluation procedures of functional classification to the swimmer. The swimmer was asked to follow the technical classifier's instructions in performing several basic and functional swimming movements, such as, dive-starting, push-off the wall when turning, floating, kicking and four basic swimming strokes. The technical classifier always emphasized that these movements were the necessary evaluation items in functional swimming classification in order that fairness of classification and competition could be maintained and the swimmer's abilities could be understood.

Second, the swimmer followed the instructions of the technical classifier as far as possible to do these movements step by step. Usually the initial three steps of functional evaluation were that (a) the swimmer performed dive-starting from the swimming block or on the swimming pool side (according to their actual conditions in competition); (b) the swimmer swam strokes of freestyle, or breaststroke (if swimmer did not attend the competition in freestyle, backstroke or butterfly), and did his or her best to swim 25 metres or longer as fast as possible; and then (c) the swimmer pushed off the wall when turning. At the same time, the technical and medical classifiers walked along with the swimmer on the pool deck and carefully observed the qualities of movements and functions of the swimmer. The technical and medical classifiers immediately discussed the functional profiles and the achievements in dive-starting, the swimming style, and pushing-off the wall when turning.

Communication between the technical classifier and the swimmer in the water test was quite different from that in the bench test. Although the technical classifier usually faced the swimmer and used English to talk to him or her before each movement was conducted, body language seemed to be a more effective method for communication during water test. For example, the technical classifier asked the swimmer to do freestyle or other swimming strokes. The technical classifier just imitated the arm stroke and then the swimmer tried to perform it. However, it was not easy to use body language to express some movements and meanings, such as swimming fast, only kicking without using arms. Thus, those movements needed to be explained clearly through direct language communication. If the swimmer did not understand English, a translator's help was very important to keep the functional evaluation going smoothly. The following is a short conversation between a technical classifier and a swimmer in water test.

> "Could you swim crawl faster from here to another side"? The technical classifier uses her index finger to point out the direction. The swimmer nods his head to indicate that he understands the instruction of the classifier. . Then, the swimmer does crawl stroke (FN, 5/8/97, ESC).

If the swimmer misunderstood the instruction of the technical classifiers but still did wrong swimming movements, the technical classifier shouted immediately and loudly. "Stop! Stop"! Then, the technical classifier gave the instruction to the swimmer again and this time he or she made sure that the swimmer understood it (FN, 12/8/96, PG).

In general, the technical classifier required the swimmer to do floating and kicking in the next two steps. The medical and technical classifiers observed the body position of the swimmer when the face float and then back float were performed (some swimmers with severe physical impairments were only able to do back float). In addition, when the swimmer only kicked for propulsion without doing arm strokes, the leg functions were also observed carefully. Finishing the above five steps of functional classification, the classifiers then compared each swimmer's functional abilities with their corresponding physical evaluations and bench test.

If the swimmer also attended backstroke and butterfly events, he or she was asked to perform these two strokes. Thus, the classifier team can understand better the abilities of the swimmer. Generally, the swimmer's S class in freestyle, backstroke and butterfly could be decided after the above functional evaluations. However, if the swimmer's functional profiles were not very clear, usually the swimmer was required to perform the swimming strokes such as backstroke and butterfly repeatedly and swim faster, while he or she was observed by the classifier team, in order to decide the S class accurately.

If the swimmers also competed in breaststroke events, they needed to follow the previous evaluation procedures again but omit the dive starting and swim only breaststroke. If the swimmer competed in medley competition, more functional evaluations for the specific event were not needed. The classifiers just calculated the swimmer's SM class directly (i.e., using the SM formula in the classification manual), according to his or her S class and SB class which were evaluated in the previous stages.

Sometimes the technical classifier spent more time evaluating some swimmers than others. In particular was this so when the results of bench test differed from those expected from the water test. For example, the swimmer could have good arm functions in the bench test but actually did not perform the comparative functions in the water test. Thus, the medical and technical classifiers needed to find out why the swimmer did not have consistent functions in terms of bench and water tests. The classifiers always needed to clarify a few questions if this situation happened. For example, is it related to the swimmers' impairment or poor swimming training? Is the swimmer a developing or good swimmer in terms of swimming techniques?

The medical classifier might want to check something which the technical classifier might neglect in the water test. Thus, the medical classifier required the technical classifier to see some specific functions of the swimmer. Usually the technical classifier asked the swimmer to do them. In a few situations, the medical classifier told the swimmer to perform some movements directly without asking or consulting the technical classifier. While most technical classifiers did not mind this intervention of medical classifiers, one technical classifier used to be angry. The technical classifier, feeling a lack of respect, explained:

> "During the water test, it is my turn. I decide what should be done and what should not be done. Thus, you medical people should ask me beforehand regarding more functional tests for swimmers. Don't disturb our technical people to do water test" (FN, 5/8/97, ESC).

Before the functional evaluation was finished, the technical classifier always asked the medical classifier and classifier trainees. "Have you seen enough? Would you like to see more"? If the medical classifier said "I have seen enough", usually the technical classifier told the swimmer or the translator that classification was finished and the swimmer could leave the swimming pool. The classifier team then had a discussion and they would decide the swimmer's class. Usually the technical classifier told the swimmer and the translator: "Please don't go too far and come back here in a few minutes". Then, the classifier team found a place which was "safe" to discuss the class of the swimmer (FN, 12/8/96, PG). Classifiers needed to ensure that the swimmer or coaches could not over hear their discussion.

4.4.4 Discussion among Members of the Classifier Team

After the classification evaluations, members of the classifier team needed to decide the most suitable classes for the swimmer. Generally, technical and medical classifiers considered the results in medical and functional evaluations and also compared those results with the classification manual to discuss the most adequate S and SB classes for the swimmer. The process of discussion was more dominated or guided by the senior classifiers. They often asked "Do you think the swimmer's points in bench test match their functional abilities"? If all members agreed with this, the senior classifier said "Please add the total points and see in what class the swimmer should be". According to this process, the swimmer may be assigned a class. Then, the senior classifier said again "Please check the classification manual again whether the disability and practical profiles of the swimmer match the description of the class". If other classifiers and trainees 'nodded their heads', generally the swimmer was assigned to the class. Before the final decision was made, the senior classifier might ask again. "Do you all agree the swimmer's class"? If no classifiers or classifier trainees had any different views, the swimmer's classes were decided (FN, 12/8/96, PG).

Sometimes the process of decision-making and discussion was not so simple and smooth, in particularly when a borderline swimmer was classified. For example, it was often seen that swimmers with CP performed in a completely different way in bench and water tests. Thus, technical classifiers needed to adjust the points of the bench test to become new functional points. To adjust the points properly and objectively, however, was full of challenges for the classifier team. It was observed that the classifier team might have two approaches to decide classes for this kind of borderline case. First, members of the classifier team tried to decide the swimmer's class directly. If all members agreed with the class, then the swimmer's points might be properly adjusted so that the swimmer's points could match the standard of the class (FN, 13/8/96, PG). Another approach was that the classifier team might try to adjust each part of points (i.e., the right and left sides of upper limbs, lower limbs and trunk). The process was also dominated by the senior medical and technical classifiers. Classifier trainees seldom actively participated in the tough discussion because they might be aware of the difficulties and confusion for the adjustment of points and avoid saying and doing some wrong things (FN, 13/8/96, PG). Finally, a classifier totalled the individual points scored to decide a class for the swimmer. Again the senior classifiers might ask each member "Do you agree with the decision"? If some members were not happy or had any suspicions about the decision, the swimmer might be marked on the classification sheet. Thus, the swimmer would be observed by all classifiers during the competition.

When classifiers tried to adjust the swimmer's points, it could be seen that technical classifiers controlled the process most of time. During the classifiers' discussion, technical classifiers always spoke more, their tone was higher and body posture was more active. Some technical classifiers might say, for example, "I do not think the points in bench test are right". Although medical classifiers might not agree with technical classifiers' opinions and criticisms, they seldom presented their perspectives loudly or argued with technical classifiers directly (FN, 7/10/98, WSC). However, a decision still needed to be made by the classifier team and technical classifiers always won the discussion. Sometimes medical or technical classifiers might not be happy with the team decision but they still needed to let it go. The classification team could not otherwise finish the classification process, and cooperation among medical and technical classifiers might break down.

A few technical classifiers might ask another technical classifier's opinions if their team could not reach an agreement among the members of the team and could not decide an appropriate class for the borderline swimmer. Sometimes this approach was useful because the extra technical classifier was like a neutral judge whose suggestions were taken into consideration seriously by the members of the team. Thus, a new agreement by the classifier team might be achieved more quickly and easily, especially when the extra classifier was a senior classifier (FN, 8/10/98, WSC).

In addition, comparison of swimmers' functions was another way to assign classes for swimmers. This is because all of the swimmers' functions have not been listed on the classification manual. Thus, classifiers needed to compare swimmers with specific types of impairments and their functional performances in order to decide their classes. For example, when classifiers classified swimmers with arthrogryposis, they did not have clear differences between classes 3, 4 and 5. In the previous experience of classifiers in classifying those swimmers, their general principles were that swimmers with arthrogryposis in class 3 could not use arms to gain propulsion, whereas swimmers in class 4 might use arms to gain restricted propulsion, and swimmers in class 5 might use their arms to gain effective propulsion. Those principles could not be found in the 1994 and 1996 functional classification systems but senior classifiers might remember the practical profiles of the swimmers. Thus, when they classified new swimmers who had arthrogryposis, they could decide by comparing the swimmers' functions with other swimmers they were familiar with (FN, 9/8/97, ESC).

Generally speaking, there were five important phenomena in the discussion among classifiers. They were that (a) classifiers used their previous classification experience and knowledge, (b) they must understand the importance of combination of physical and functional abilities in swimming classification, (c) they needed to make good use of the classification manual, (d) they needed to interpret the swimmer's movements, and (e) they needed to ask themselves and explain reasons why the swimmer should be in one class and not in the other classes. During the decision-making process, classifiers not only dealt with the classification for the swimmer, but they needed to maintain fair competition for all of swimmers. A senior classifier said:

> "We classifiers should not give benefits to developing swimmers and we also cannot penalize any good swimmers. Any mistakes made by the classifier teams may affect the swimmer for a long time and even we classifiers may not see the swimmers again because they may drop out immediately and they don't trust us any more. Thus, we must make a careful decision for any swimmers and reduce misclassifications" (FN, 8/10/98, WSC).

The classifier also said:

> "We are not dealing with national classification. In our own countries maybe we can do what we like. In the international classification let's forget our own countries. We must be fair for any countries and any swimmers or most swimmers. We are here not talking about our own swimmers or talking for our countries. We are working for swimmers, for fair competition and for IPC" (FN, 8/10/98, WSC).

Therefore, classifiers seldom used swimmers from their own countries as examples for comparison (only a few senior classifiers did that). Although the swimmers and their coaches could not participate in the discussion, it seemed that their classes and rights had been considered by the classifier team.

4.4.5 Explanation of Classification Results

When the classifier team made a decision for the swimmer, a classifier was appointed to inform the swimmer and his or her coach of the decision. Most swimmers were nervous in waiting for the results. It was expected that the classifiers' decision might affect their current and future competition directly. On most occasions the classifier just told the classification result to the swimmer and did not explain in detail if the result met the expectation of the swimmer. Then, the classifier asked the swimmer to sign the classification sheet. It indicated that the swimmer was informed of his or her class.

A few swimmers, however, did not like the decision of the classifier team. This occurred, in particular, when swimmers were assigned to higher classes which they did not expect. Some had direct emotional reactions. For example, a swimmer loudly shouted to the classifier and did not want to sign the classification sheet. Even when the classifier tried to explain to the swimmer, unfortunately, the swimmer still did not accept it. Another senior classifier explained to the swimmer, "If you don't sign it, you cannot attend the competition. If you sign it even if you don't like the class, you can still appeal and attend the competition". However, the swimmer just went away and did not appear in swimming competition any more (FN, 2/6/96, BSC). Fortunately, this direct conflict between swimmers and classifiers was seen just once during the long-term observation in swimming classification.

When the swimmer or coaches did not like the classification result, a lot of swimmers just appeared upset. They might sway their hands or heads or just said no to express their disagreements of the classifiers' decision. Some classifiers might directly and patiently explain the reasons why the swimmer was assigned to the class and also use the classification manual to show the classification rules and profiles to the swimmer (FN, 12/8/96, PG). Sometimes a few swimmers or coaches might ask more detailed and "professional" questions or even challenge why other swimmers were assigned to advantageous lower classes. If the classifier had free time, he or she might try to answer some of their questions. Otherwise, the classifier just told the swimmer and coaches to ask the head classifier if they had any inquiry, or to claim a classification appeal and complete the protest form (FN, 7/10/98, WSC). Thus, the other classifier team (i.e., the classification panel) might classify the swimmer again. Generally, this stage had more complicated interactions among the classifier team and the athletic team.

4.4.6 Classification Appeal

Generally speaking, for swimmers the first part of swimming classification (from Sections 4.4.1 to 4.4.5) was very important. This could be explained by the fact that most swimmers could be classified to proper classes for competition. However, a few swimmers (usually less than 10% of the total number of classifications) were not satisfied with the decisions of classifiers and may appeal because they felt that they had been misclassified.

Usually for administrative reasons an appeal of swimming classification should be made within six hours of the swimmer being classified. The team manager needed to complete a protest form and submit it with a protest fee (i.e., about 100 to 125 US dollars) to the sport organisers. Then, the sport organisers transferred those appeal cases to the head classifier. The head classifier needed to check a few things before the appeal was accepted and the reclassification was formally conducted. First, the head classifier read the reasons for the appeal and then he or she chose three authorised classifiers (at least one medical classifier and one technical classifier) to make up the classification panel for each appealing case. Principally, those three classifiers had not previously classified the swimmer or had not classified the swimmer within the last three years. Second, the timing of those reclassifications was set for the last day of classification. Usually, each appeal case had been arranged to last for about an hour (FN, 8/10/98, WSC). It took a little longer than the general classification.

Reclassification was taken seriously by the classifier team. The head classifier, for reasons of privacy, usually banned other classifiers or classifier trainees from being close to the classification area, to observe the process and evaluations and to listen to the discussion of members of the classification panel.

Generally, the classification panel was appointed by the head classifier to reclassify the swimmer. Those three members read the reasons for appealing and then had a short discussion before they met the swimmer. Their discussion was, for example, "do we need to follow the whole classification procedures again"? In other words, did classifiers need to do bench tests and then water tests? "Who is going to do the bench test"? "Can we two medical classifiers double check the results of the bench test"? For most appeal cases, swimmers were carefully classified again following the complete and proper classification procedures (FN, 8/10/98, WSC). The procedures were similar to the Sections 4.4.2 and 4.4.3. Finishing the evaluation, the swimmer and escort were asked to wait outside while classifiers discussed the results.

Discussion for the appealing swimmers usually took longer as the panel members needed to be in agreement regarding the decision for the swimmer's class. If they had different results, it was necessary to argue different points of view in terms of physical and functional performances of the swimmer. The classifiers relied on using the classification manual and comparing the functions of different swimmers in the class to arrive at a proper decision. Usually the technical classifier might explain skills of the swimmer in detail to persuade other members to accept a functional or technical approach. Actually, the technical classifier's opinions were always persuasive. Their decisions were more powerful than those of medical classifiers (FN, 14/10/98, WSC).

Even when the classification panel had made a decision, answering the questions for the appeal case was necessary. Usually a classifier who is the native English speaker was chosen to complete the protest form, particularly to write down the reason why the swimmer was arranged into the specific class. All members in the panel read it again. If they agreed with the decision, then they signed the protest form and explained the result to the swimmer (FN, 8/10/98, WSC).

Explanation of the result of reclassification was also difficult particularly when the result did not reach the expectation of the athletic team. This meant that the classification appeal was withdrawn (i.e., the athletic team lost the appeal). Usually the classifier spent more time explaining the whole process and presenting obvious evidence, such as points in bench and water tests and functional abilities, to persuade the swimmer to understand the decision. Also the swimmer and the escort might ask a lot of questions and the classifier would try to answer most of them.

4.4.7 Observation of Competition

Classifiers not only conducted evaluations and dealt with appeals, but they also needed to ensure fairness in competition. Thus, classifiers must observe the competition to ensure that each swimmer has been assigned to an appropriate class. Sometimes a few swimmers might not perform at their best thus trying to gain an advantage in classification. If classifiers did not notice those swimmers during evaluations or they misclassified swimmers, observing participants during competition might help to discover those wrong classifications. It may be seen that their functional performances were different from those of other swimmers in the same class during the competition. When swimmers who might be misclassified were identified by classifiers, senior classifiers might have to have a short discussion resulting in the head classifier taking an immediate action to cope with those swimmers. That is, a classification protest may be made in order to evaluate those swimmers again.

In order to observe the competition, classifiers were specially arranged in a middle spectator area. That observation area also had restricted access to other people. Five classifiers in the observation area (usually the head classifier, two classifiers and two classifier trainees) were given radio headsets in order that they could directly communicate with the technical delegate (TD) and two technical advisors (TA) who stayed beside the swimming pool. Other classifiers and classifier trainees might be doing paper work, such as an arrangement of swimmers' classification sheets into the event orders, or they concentrated on observation and then wrote down functional performances and movements of swimmers whose performance was particularly different (FN, 17/8/96, PG).

Sometimes the TD and TA detected that some swimmers did illegal movements such as "drop one shoulder" in butterfly events, "uneven level of shoulders" in breaststroke strokes, "uneven touch in arms when turning" in breaststroke and butterfly event, "asymmetric kicking of legs" in breaststroke and butterfly events, "breaststroke kicking" in butterfly events, etc. The TD or TA asked classifiers who were in the observation area to check swimmers' classification sheets immediately. Classifiers needed to give this kind of classification information of swimmers to the TD and TA and also answer the TD and TA's questions regarding the illegal swimming movements. Thus, the TD and TA might decide to disqualify swimmers because of illegal movements. Usually, classifiers only had ten to twenty seconds to check the swimmers' information and answer questions, and the TD and TA also needed to make a quick decision whether to disqualify swimmers or not according to the classifier's response and the TD and TA's experience. Thus, during the breaststroke, butterfly and medley events, classifiers were busy answering and clarifying urgent questions from the TD and TA. However, if classifiers gave uncertain information or ignored the TD and TA's questions, the TD and TA might be angry and criticise classifiers' abilities. With regard to freestyle and backstroke events, classifiers were likely to feel more comfortable because less problems were expected in those events (FN, 12/10/98, WSC).

Sometimes senior classifiers had an urgent discussion if they identified swimmers whose performance differed completely. Then, the head classifier might complete the protest form to reclassify those "different" swimmers after swimming events. Although those situations seldom happened (in fact they only happened on three occasions in two and an half years of observation in national and international competition), the head classifier needed to cope with the issue immediately and carefully.

In addition, other countries could also protest classes of new swimmers after those swimmers appeared in their first international competition (SAEC-SW, 1998). In particular, those new swimmers performed different movement functions and also won medals in their first international event because most people did not think new swimmers may win medals or even break world records. However, only the chief representative of each country was allowed to make a protest. The procedure of the protest of classification was similar to the appeal of classification (see Section 4.4.6).

Then, the head classifier needed to deal with the protest immediately even during the competition. Usually he or she read the reasons for the protest and then arranged for three senior classifiers to reclassify the new swimmer who was the subject of a protest by other countries. The reclassification for the protest case should be finished on the same day that the protest was submitted (FN, 13/10/98, WSC).

4.4.8 Classification Protest

As mentioned in the Section 4.4.7, protests against swimmers might be raised by the head classifier or the chief representative of each country during the competition. The head classifier always dealt with this case seriously. He or she usually found three senior classifiers who had not classified the swimmer before to make up the classification panel for reclassification. Also the head classifier needed to complete a protest form and gave it to the chief representative of the country of the swimmer. When the chief representative received the formal notice, it was necessary to discuss with the head classifier and make an appointment for the reclassification. The reclassification procedures and interactions among classifiers and the swimmer for the protest were similar to the appeal of classification (see Section 4.4.6).

4.4.9 Meetings of Classifiers

It was common that classifiers had regular meetings during the competition. Their discussion included several things. First, classifiers discussed borderline swimmers who were observed during the competition. Thus, classifiers needed to decide if those swimmers were assigned to appropriate classes or whether they needed to be observed again in the next events. Second, classifiers may discuss problems that occurred on the day of observation. Usually the TD and TA participated in the discussion. It was often seen that the TD and TA complained of poor reactions from classifiers when they asked classifiers and trainees questions during the competition.

They also recommended some ways in which the problem may be resolved. Third, a few protest cases were opened and discussed again. Thus, other classifiers who did not participate in the reclassification might be allowed to understand what was going on. For example, if the result in reclassification was different from the previous classification, the head classifier may comment on what was different in terms of bench and water tests and what was neglected by classifiers. Thus, classifiers might learn something from the protest case (FN, 16/8/96, PG; FN, 14/10/98, WSC).

Fourth, classifiers tried to decide the classification status for each swimmer. According to the current swimming classification system, there are four kinds of classification status for swimmers (SAEC-SW, 1998). If a new swimmer participated in competition, he or she was assigned to a "N" (i.e., new) classification status. On finishing the competition, if classifiers thought that the swimmer's physical condition (i.e., disability or impairment) would be stable in the future and that the functional abilities had been observed carefully during the competition, then classifiers agreed that the swimmer held a "P" (i.e., permanent) classification status. Thus, the swimmer could use the same class to attend all IPC competitions and did not need to be reclassified unless the classification system was changed or other countries protested the class of the swimmer. If a swimmer had a progressive disability or did not perform the similar functional abilities like other swimmers in the same class, his or her classification status was "R" (i.e., reviewed). In other words, this swimmer would be reclassified or observed again in the next international championships. In addition, a special status was called "PP" (i.e., permanent classification due to a protest). This meant that a swimmer had already held the "P" status but was protested by the head classifier or other countries. After the reclassification, the swimmer held the "PP" status and could not be protested again unless the functional classification system was revised or changed (SAEC-SW, 1998).

Fifth, classifiers might share opinions or give comments to improve the classification system or the process. For example, some classifiers pointed out that there were a few problems in the current swimming classification system such as SB classes. A senior classifier then asked "how do we improve the system" (FN, 7/8/97, ESC)? Then, classifiers shared their ideas and experience to discuss possible solutions. Sometimes there were no solutions to some issues such as the criteria for minimal disability, and objective bench and water tests. Thus, getting a consensus among classifiers became one of the most suitable ways to tackle some classification problems (FN, 15/10/98, WSC). In addition, there were some differences among classifiers in terms of tests of methods. In the classifier's meeting a classifier stated:

> "If we classifiers have different approaches in swimming classification and evaluations, how can we teach classifier trainees to use the system properly? Some trainees may not believe the system or trust classifiers any more if this happens continuously and we did not clarify it. I suggest we classifiers should have a consistent way to evaluate swimmers" (FN, 11/10/98, WSC).

In addition, during the classifier's meeting senior classifiers sometimes assigned some "homework" or "research" to classifiers. For example, a senior classifier said:

> "Do we need research to prove our classification system"? Some classifier nod their heads. "If the answer is Yes, what kind of research do we need? We need to set up some criteria for people who understand our system to do proper research. Otherwise, some researchers may ruin the system or just try to take an advantage on our swimmers. Could you give comments on swimming research? Can we classifiers conduct some research" (FN, 14/10/98, WSC)?

Because most classifier's meetings were held after the competition on each day (usually the meeting started after 10 pm), a lot of issues could not be discussed clearly within one or two hours. Thus, senior classifier might ask classifiers to think about a few important classification issues which they had not fully discussed so that they could discuss them at the next classifier's meeting.

Discussion of the criteria for trainees to become classifiers was also an important theme in the classifier's meeting. Classifiers talked about strengths and weaknesses of each classifier trainee in terms of swimming classification, experience, understanding and participation. Then, the head classifier and TD offered feedback to each trainee on the last day of the competition (FN, 14/10/98, WSC).

Finally, the head classifier and TD gave general comments to classifiers and classifier trainees on the last day of the competition. It was called debriefing. In addition, the head classifier and TD also hoped that other classifiers and trainees could add their opinions to SAEC-SW and the classification committee. Thus, any problems in the entire classification seminar, classification process, and classification system could be identified and improved. However, most classifier trainees seldom spoke in the debriefing (FN, 16/10/98, WSC).

4.4.10 Summary of the Classification Process

As presented from Sections 4.4.1 to 4.4.9, swimming classification is a complicated and continuous process. However, its importance should not be neglected regarding fairness of competition. Because of the complexity of the process, using the flow diagram to summarise the general classification procedures (see Figure 4.1) will be easier for readers to understand the entire swimming classification process. Making sense of the classification process is important in this study. Thus, in the next section more themes which occurred in the classification process can interpreted and discussed in depth.

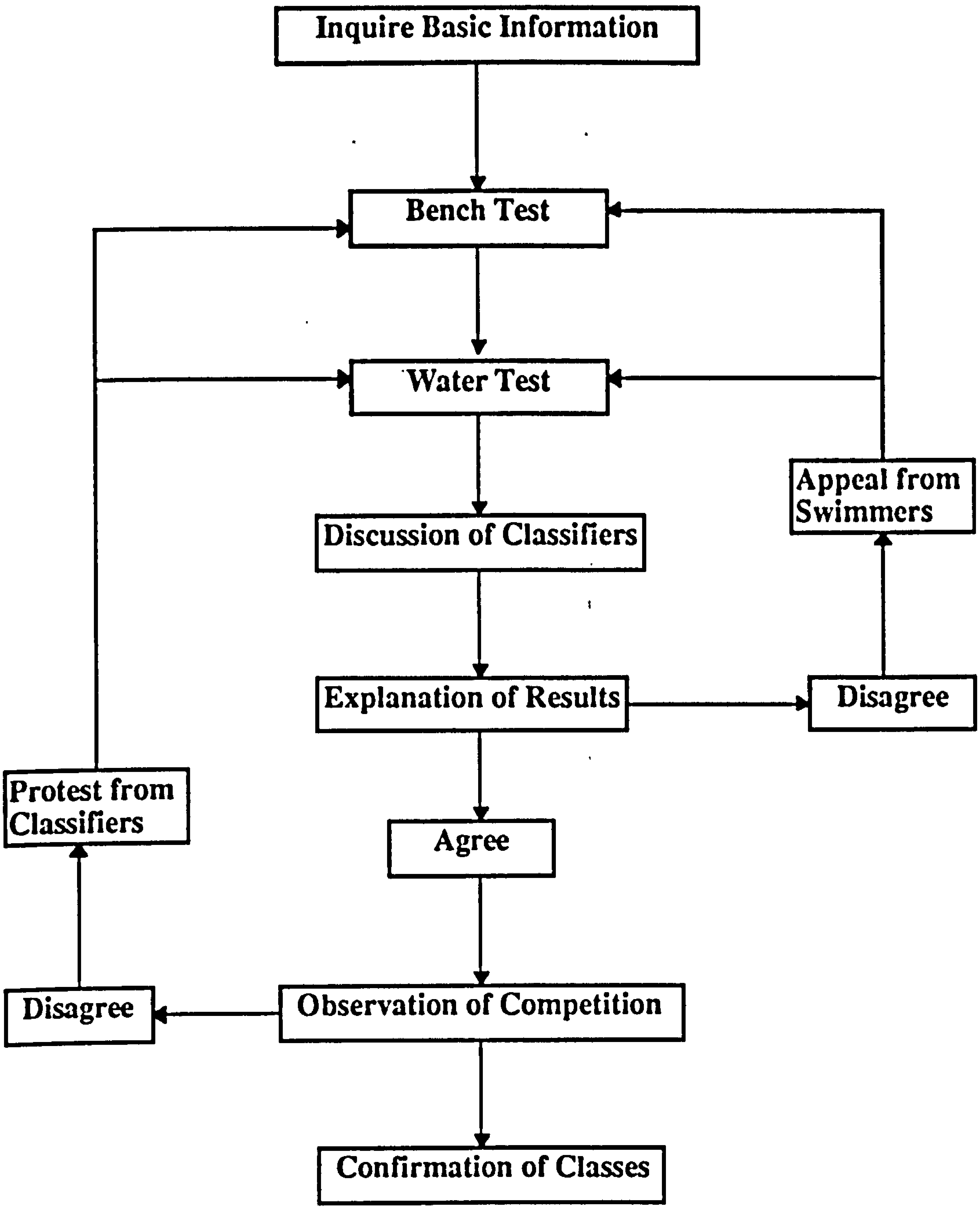


Figure 4.1 Procedures and Stages in International Swimming Classification

4.5 Features of the Swimming Classification Process

As described in the previous section, swimming classification is a complicated process. Several features of the swimming classification process can be identified in this study. They are divided into three main themes: the process, resources used by social actors, and resources in the process. Features of the process include (a) interaction among social actors, (b) routinization in the classification process, and (c) rules in the classification process. The features of resources used by social actors include (a) resources used by classifiers in the classification process, (b) power relations among social actors, and (c) allocation of rewards and sanctions. Finally, resources in the process have two features: (a) roles played by social actors in the classification process and (b) conflicts in the classification process. Those eight features are now discussed in this section.

4.5.1 Interaction among Social Actors

Swimming classification is an interactive process among the members of the social group. In the interactions among swimmers, medical and technical classifiers, the specific features of interactions could be categorised as follows: (a) cooperation, (b) discussion and negotiation, (c) explanation, and (d) respect and dignity. Each of these items is discussed below.

4.5.1.1 Cooperation

Cooperation between swimmers and classifiers and among classifiers in the interactive process is very necessary and important. Swimmers' cooperation in classification can help classifiers to assess the swimmers' physical and functional abilities more accurately, and then classifiers may decide on the most appropriate classes for swimmers. Most swimmers also hope to be classified fairly in order that they can concentrate on competitions and not worry about reclassification during the period of competition. However, sometimes cooperation between swimmers and classifiers in the classification process may develop problems. These may be attributed to four main conditions.

First, some swimmers want to gain advantages in their classes. They may pretend to cooperate with classifiers but actually do not do their best to perform tasks in medical and functional evaluations. Two possible reasons may explain this. On the one hand, swimming classification is usually held one or two days before the competition and therefore some swimmers do not want to waste their energy too much in classification. They just want to conserve energy and concentrate on the competition. On the other hand, it is possible that a few swimmers may not cooperate with classifiers (we may view this as cheating) in the classification process in order to gain advantages and win unfairly.

Second, swimmers do not follow classifiers' instructions because they resist those classifiers who are too authoritarian. It is very easy to feel the absolute power of classifiers in classification and some swimmers do not like the attitudes of some classifiers. Classifiers may make them feel extremely uncomfortable. Thus, a swimmer's rebellion can be understood. This will be discussed more in later section under 'dignity and respect' (Section 4.5.1.4).

Third, some swimmers cannot speak and understand English. We can recognise that communication between swimmers and classifiers in this case may be poor and problematic. In other words, swimmers may be considered to be uncooperative if, for example, they do not follow the classifier's instructions and perform the correct movements. However, we can try to find translators to help swimmers and classifiers in the classification process, or classifiers can demonstrate the testing movements patiently and repeatedly. It is believed that the problem can be resolved through proper language or body posture communication.

Fourth, medical and functional classifiers may not cooperate well. This is because they sometimes have different points of view on how to classify swimmers and interpret swimmers' abilities which results in arguments and disagreements among members of the classifier team (FN, 5/8/97, ESC). Fortunately, lack of cooperation among classifiers seldom happens in swimming classification teams.

4.5.1.2 Discussion and Negotiation

Discussion can often be seen throughout the interactive process. For example, classifiers discuss the unclear parts throughout the period of the classification process or discuss a class for a swimmer according to his or her medical and functional evaluations after the phases of bench and water tests are finished. Generally, medical and technical classifiers should negotiate with each other and make a decision on the classification result (FN, 13/8/96, PG). The main purpose of discussion among classifiers in classification is to provide clear testing results for swimmers, so that they can be assigned into the fairest classes.

Sometimes discussion between medical and technical classifiers, however, does not proceed effectively. As mentioned before, if a borderline case is classified, medical and technical classifiers may have different viewpoints regarding assigning a class to the swimmer. In this instance, the process of discussion may be transformed into a process of negotiation. In other words, classifiers need to "arrange a mutually acceptable accommodation through maneuvering and consulting" (Shibutani, 1984, p. 133). Classifiers must assign a class to the swimmer, but they are not sure of the accuracy of the classification result. As a result, they mark the classification sheet after the process of negotiation. Thereafter, all classifiers know that the swimmer should be observed during the competition (FN, 12/8/96, PG). However, the ambiguous questions regarding the swimmer's class may be discussed or negotiated again.

Negotiation for the swimmer's class does not mean that any classifier wins or loses the discussion. It is just that classifiers agree that the swimmer should be assigned into a reasonable class and the decision may not harm the swimmer, other swimmers and classifiers. In particular, negotiation among classifiers not only concerns the swimmer, but classifiers also consider the entire competition in terms of fairness and equality (IN, 1/6/98, BSC).

4.5.1.3 Explanation

Explanation in the interactive process may be seen in the following four situations. First, when classifiers begin classification, some classifiers explain the purpose of classification and the general procedures of medical and functional evaluations to swimmers. Second, while classifiers evaluate swimmers' movements, some classifiers explain simply the reasons for the testing movements. Third, when the evaluations of classification are finished and classifiers have made a decision, classifiers explain the results to swimmers and coaches. Lastly, sometimes medical classifiers and technical classifiers have different points of view to interpret borderline cases and so they explain their opinions, reasons and possible principles to other classifiers.

Generally speaking, explanation in the interactive process is to make the classification process run smoothly. If classifiers' explanations are clear, swimmers understand the purpose and procedures of classification and are more likely to believe that their classifications are fair. In this way some negative situations, such as appeals or arguments, may be avoided or reduced. Gradually, classification may not be a main issue which is often discussed by swimmers. In particular, when swimmers lose in competition, they do not blame classifiers and the classification system because they may think that they have been fairly and carefully classified by classifiers.

4.5.1.4 Respect and Dignity

Although SAEC-SW classifiers have authority and power to classify swimmers, they must respect all swimmers with physical impairments no matter what reasons

(Williamson, 1997). Undoubtedly, classifiers need to respect swimmers' achievements, and treat swimmers as real athletes instead of treating them as patients. Even classifiers can learn a lot of things from swimmers such as their spirit, specific swimming skills and compensatory movements. However, if swimmers always have negative feelings about the classification process and classifiers, then it can be anticipated, for example, the rebellion of swimmers, cheating in the classification or an attempt to fool classifiers.

Most SAEC-SW classifiers respect swimmers and their classifier colleagues in this study. However, one classifier challenged some swimmers' and classifiers' culture. This classifier devalued swimmers and international competition and did not show her respect to swimmers in classification (FN, 13/10/98, WSC). As a result, some classifiers argued this classifier should be sanctioned by the SAEC-SW according to the code of conduct of classifiers (SAEC-SW, 1998).

The SAEC-SW has developed clear and extensive rules to clarify the meanings of respect in classification so that authorised classifiers need to follow the rules to conduct classification.

> Authorised classifiers shall
> - a] Respect the swimmers and coaches/team leader by
>   - 1] maintaining a courteous attitude during the classification process,
>   - 2] involving the swimmers and coach/team leader in discussion in matters pertaining to their classification and explain the results, and
>   - 3] handling protests in a fair, non-threatening and non-arbitrary manner.
> - b] Respect the rules by
>   - 1] establishing clearly defined procedures for the classification and follow them, and
>   - 2] making the procedures widely known to swimmers and coaches/team leaders.
> - c] Respect the decision making process by
>   - 1] treating discussions as confidential information,
>   - 2] maintaining confidentiality of the swimmers information whenever possible,
>   - 3] no criticising other classifiers (SAEC-SW, 1998, pp 5-6).

When swimmers are evaluated on the bench during the medical classification, some swimmers may feel like patients being tested in the medical examination room. Usually swimmers only wear a swim suit and lie down on the bench during physical evaluations. If medical classifiers do not notice their attitudes, behaviours or speech, obviously, swimmers may feel that they are losing their dignity. In particular, classifiers need to ensure their speech and jokes are inoffensive when they classify oriental swimmers. For example, some Asian swimmers are shy and they do not like classifiers playing jokes on them, especially related to their impairments and movements. For those swimmers, joking may be one kind of insult. It may upset swimmers (FN, 13/8/96, PG; IN, 8/8/97, ESC). Thus, classifiers need to be very careful in the interactive process.

4.5.2 Routinization in the Classification Process

Giddens stated that routine is a basic element of day-to-day social activity. Specifically, Giddens (1984) defined *routinization* as

> The habitual, taken-for-granted character of the vast bulk of the activities of day-to-day social life; the prevalence of familiar styles and forms of conduct, both supporting and supported by a sense of ontological security (p. 376).

When the idea was used in the interpretation of the swimming classification process, there were a lot of routines in the process. Classifiers, therefore, might understand better how they dealt with the whole process when a lot of classification activities could be going on. For example, medical classifiers understand what physical evaluations need to be done and they can conduct proper bench tests. Thus, identification of medical diagnoses of swimmers and conducting of physical evaluations for swimmers belong to the regular and repeated social practices of medical classifiers in the classification process. It is most important that they can explain clearly *why* this is needed.

On the other hand, technical classifiers have other routines in the classification process. They need to identify swimmers' functional abilities step by step. For example, an understanding of swimmers' skills, body positions and functional limitations is a necessary routine in the water test which is controlled by technical classifiers. Explanation of swimmers' functional abilities during the discussion is also routine in the process.

In addition, medical and technical classifiers also need to work together routinely. For example, counting swimmers' scores in classification, discussion of swimmers' classes, explanation of classes to swimmers and coaches, observation of competition and participation in the regular discussion of the classifiers' meetings are also routine actions. Without those routines, classifiers cannot control the classification process smoothly and may not assign swimmers into appropriate classes, and swimmers might complain of the poor evaluations and classification outcomes. Thus, social order in the classification process would be disturbed or even collapse.

Generally, many social practices among social actors in the classification process can be thought of as routines. The values of routine actions result from solutions to problems in swimming classification and managing the complexity of classification. When similar classification actions keep occurring through successful solutions to classification problems, they become automatic. Classifiers do not have to think of those classification practices when they classify swimmers. For example, bench tests and water tests carried out by classifiers in swimming classification are taken for granted (IN, 7/8/97, ESC). Then, the automatic and regular actions become more and more traditional. As most social actors accept the tradition, solidification of social actions increases but, one the other hand, resistance to changing the routines becomes more and more pronounced.

Maintaining the routines in classification, however, is not a easy job unless classifiers have a consensus and contribute their efforts to it. In particular, classifiers need to be familiar with the entire classification process and have a lot of classification experience. In other words, they must learn the routines and completely understand the classification culture and control the classification process. However, to be an authorised classifier and to be accepted as a member of the classifier group one needs to be evaluated by other members in the classification group for several years. In addition, the swimming classification system has been revised every four years. This may affect the routinization of the classification process because a few routine actions are changed. When establishing new routines, usually only a few practices need to be considered. This allows classifiers to produce them in a short time (FN, 12/10/98, WSC). This is because the social practices in classification are reproduced or transformed more by classifiers. Fortunately, new routines in swimming classification are rarely needed because the current classification process may produce the satisfactory outcomes.

Sometimes new routines are developed as solutions to new problems. For example, a few borderline swimmers who have progressive disabilities or swimmers who did not fully cooperate with classifiers before are asked to sign a classification consent form for reclassification (FN, 8/10/98, WSC). This is because classifiers may hurt swimmers and also classifiers need swimmers to fully cooperate. Those swimmers must sign, otherwise, they cannot be reclassified or enter the competition. This new routine provides major benefits in mutual cooperation between swimmers and classifiers. Thus, classifiers are legally protected and cheating amongst swimmers is significantly reduced.

Sharing experience and knowledge is also an appropriate way to maintain the routines in classification (Shibutani, 1986). Specifically, a senior classifier has more authority and power to affect the behaviours of junior classifiers and classifier trainees. When a senior classifier tells junior classifiers or trainees to do something, they need to remember it and follow it in the next classification even if they do not like or understand it. It can be seen that junior classifiers and classifier trainees try to learn the routines from senior classifiers in order to deal with a lot of classification interactions smoothly and resolve classification problems successfully. This idea will be discussed in detail in the Section 4.5.5- power relations among social actors.

4.5.3 Rules in the Classification Process

There are two general types of rules that are used to produce, reproduce or transform social systems and social practices. One is constitutive and the other is regulative (Giddens, 1984). It can be seen that these two types of rules are used in swimming classification to keep the classification process going and to control behaviours of social actors (i.e., classifiers and swimmers). For example, the classification system is used to guide classifiers to conduct evaluations. The classification system can be regarded as a set of constitutive rules. All swimmers with physical impairments also need to follow the classification system. If they do not want to be classified or they are against the classification system, they cannot attend the competition.

In addition, the code of conduct of classifiers can be viewed as a set of regulative rules. All classifiers must obey these rules to avoid sanctions. These rules regulate the behaviours of classifiers. Sometimes the instruction of senior classifiers, in particular the head classifier and the TD, may be thought as one set of rules or norms for classifiers and trainees. The regulative rules also control and restrict their behaviours and actions so that social order in the disability swimming social system and the classification process can be maintained. Although those instructions of senior classifiers are regarded as informal rules, they still belong to the social rules and cultural norms in the social practices. As Giddens (1984) argued:

> Awareness of social rules, expressed ... in practical consciousness, is the very core of that 'knowledgability' which specifically characterizes human agents. As social actors, all human beings are highly 'learned' in respect of knowledge which they possess, and apply, in the production and

> reproduction of day-to-day social encounters; the vast bulk of such knowledge is practical rather than theoretical in character (p. 22).

Generally, social rules have two main characteristics. "Rules relate on the one hand to the constitution of *meaning* and on the other hand to the *sanctioning* of modes of social conduct" (Giddens, 1984, p. 18). Swimming classification rules include those two aspects. For example, general classification procedures and rationales are described in the classification manual (SAEC-SW, 1998). Specifically, the meanings of bench and water tests are explained and conceptualized in the handbook. In addition, swimmers must be classified and hold IPC swimming classes so that they can attend the IPC sanctioned swimming competition. Those swimmers who do not intend to obey the rules would be sanctioned or punished. The most severe punishment for swimmers is that they are banned from attending the swimming competition.

A similar concept may be applied to classifiers. The code of conduct of classifiers may prevent the over expansion of classifiers' authority and power. For example, if classifiers always make mistakes in classification or do not treat classification as confidential, they may be expelled and may lose their qualification as authorised classifiers (FN, 12/10/98, WSC). Thus, this rule not only encourages classifiers to do only what they need to do but it also has the function of controlling their behaviours and actions to a reasonable and acceptable range and also maintaining the quality of classification.

In addition, Giddens (1984) stated that rules used in the social interaction have other characteristics. Generally, they can be separated into four categories: (a) intensive versus shallow, (b) tacit versus discursive, (c) informal versus formalized, and (d) weakly sanctioned versus strongly sanctioned. Social rules used in the swimming classification process may mix the different degrees of the four categories. For example, the swimming classification system used by classifiers and swimmers has more intensive, tacit, formalized and strongly sanctioned rules. On the other hand, classifier trainees' opinions which are presented in the classifiers' meetings in order to improve or change the classification process and system may be thought of as more shallow, informal and weakly sanctioned.

Shibutani (1986) used the term *social norms* to replace the use of social rules. Actually, these two sociological terms have similar meanings and they are strongly related to each other when they are used in the study. Shibutani explained that

> The common understandings shared in familiar situations are called *norms*. Social norms are the standards of desired conduct in a transaction that enjoy a high degree of consensus within a group or community. They define the range of acceptable behaviour, providing a framework within which participants are expected to make their choices, regardless of personal feelings or preferences. Norms arise in any type of recurrent transaction (p. 13). ... Norms are standards of acceptable conduct. They are only rules, however, and may be broken (p. 14).

It is believed that rules in the swimming classification process are generally a consensus among social actors, and rules affect their behaviours, practices and roles in the classification group. For social actors in swimming classification, conformity of the social norms is encouraged and rewarded and deviation of social norms is discouraged and sanctioned. This concept will be discussed in great depth in the Section 4.5.6.

4.5.4 Resources Used by Classifiers in the Classification Process

Giddens (1984) noted that people who can control "resources" usually have more power in the social group. The resources which constitute structures of domination are of two sorts- "allocative and authoritative resources" (p. 258). Giddens also explained that allocative resources are material resources which include the natural environment and physical artifacts. On the other hand, authoritative resources are non-material resources. Giddens expanded the idea of authoritative resources. Authoritative resources are "(a) organization of social time-space (temporal-spatial constitution of paths and regions); (b) production/ reproduction of the body (organization and relation of human beings in mutual association); and (c) organization of life chances (constitution of chances of self-development and self-expression)" (p. 258).

In swimming classification, resources in the Giddens's structuration theory may partially help us explain resources used by classifiers in the classification process. Classifiers who have power to dominate the classification process are more related to the extensive use and control of authoritative resources instead of allocative resources. Authoritative resources used by classifiers in the classification process can be categorised into three main parts: medical knowledge, sport knowledge and the classification system. Each resource is conceptualised in detail respectively.

With regard to medical knowledge used by classifiers in the classification process, it can be divided into more sub-items. They include (a) understanding medical diagnoses of swimmers, (b) understanding main characteristics of different types of physical impairments, (c) choosing appropriate physical evaluations for swimmers, (d) conducting appropriate physical evaluations, (e) transforming test results into quantitative points, and (f) explaining physical evaluations to swimmers, classifiers, and trainees. In particular, medical classifiers need to use medical knowledge all the time in the process of bench tests. Technical classifiers may use some of their medical knowledge to help medical classifiers conduct bench tests and clarify some testing results.

Sport knowledge and specific able-bodied swimming knowledge is used by technical and medical classifiers in the classification process. In this study, it can be observed that the use of swimming knowledge in classification is very important. It includes (a) understanding different swimming skills and strokes, (b) identifying body position of swimmers, (c) distinguishing the quality of movements and training of swimmers, (d) guiding swimmers to do functional evaluations, (e) distinguishing functional abilities of swimmers in different classes, (f) correcting illegal movements or strokes of swimmers, (g) suggestions for swimmers and coaches to improve swimming skills, and (h) explaining results of water tests to swimmers, classifiers and trainees.

Generally speaking, both medical and technical classifiers need to have medical and swimming knowledge. According to the classification rules (SAEC-SW, 1998), medical classifiers need to be physicians or physiotherapists and technical classifiers need to have a background in coaching or teaching swimming whether in able-bodied or disabled swimming. Thus, we believe that medical classifiers have already had medical knowledge and technical classifiers have swimming knowledge. However, how do medical classifiers have enough swimming knowledge and technical classifiers have reasonable medical knowledge and then they can collaborate together and apply medical and technical knowledge in classification? This topic is relevant to "socialization of classifiers" and will be examined and discussed in the next chapter.

In addition, medical and technical classifiers who classify swimmers should do so on the basis of the rules of the classification system. The newest edition of the SAEC-SW classification system is considered the exclusive guideline for classifiers to conduct fair classification and maintain fair competition. Although swimmers or classifiers may not fully agree with the contents of the classification system and rules, they still need to obey it and use it until the classification system undergoes its four yearly revision. Theoretically, classifiers need to understand and be familiar with the classification system. This includes a complete understanding of the contents of the classification system. In particular, during the discussion and decision-making process, the swimming classification manual is extensively used. Often medical and technical classifiers need to check physical and practices profiles of swimmers from the classification manual during the discussion process before the final decision is made (FN, 12/8/96, PG; SAEC-SW, 1998). In addition, classifiers sometimes use the classification manual to explain the classification results to swimmers and their coaches. This may show that swimmers are classified fairly, according to the classification rule. However, medical classifiers who are instructed by the head classifier do not check the classification manual during the bench test because this is not a professional way from them to do classification.

To summarise the above discussion of resources used by classifiers, if disability swimming classification is regarded as specific and professional work, classifiers need to have professional knowledge (i.e., medical and swimming knowledge) and make good use of it in actual classification practices. In addition, the classification evaluations and decision-making need to rely mainly on the classification system. Classifiers need to interpret the rules of the classification system carefully in order to use the same classification principles and resources for every swimmer and thus maintain the fairness of classification and competition. If swimmers and other members support classifiers' actions, the classification practices can be consolidated and the reputation, authority and power of classifiers in the disability swimming social system can still be maintained. In addition, domination of classifiers in the classification process may be maintained and changes of the social practices tend to be reduced.

Giddens (1984) had an emphasis that "rules and resources are organized as properties of social systems" (p. 25). The structural properties of social systems are both the medium and outcome of the social practices. This idea illustrates that the classification process and the disability swimming social system are obviously influenced by social agents such as senior classifiers who access to more resources and develop most of the social rules. For example, most routines in the classification process can be recognised as the outcomes of social practices which are mainly affected by rules constructed and resources used by classifiers. When regularities and routines become tradition in swimming classification, senior classifiers may prefer to stabilize the structure. Finally, classifiers use medical knowledge, swimming knowledge, and the classification system in the classification process may become routines. However, difficulties in changing the system, structure and practices can be expected.

4.5.5 Power Relations among Social Actors

To discuss power relations in the social group, it would be necessary to understand the question. What is power? Shibutani (1986) defined power as "the capacity to coerce another to do something that he or she does not want to do" (p. 403). Using this definition in the classification process, it can be seen that power among social actors is not fully shared in the entire social process. Tomlinson (1998) argued that "power is a relationship, a dynamic and that the relationship involves human agents struggling over resources and outcomes". Giddens (1979) argued that "power is instantitated in action, as a regular and routine phenomenon" (p. 91). The concept of power both as transformative capacity and as domination in social practices depends upon utilisation of resources.

In this observation study, five types of status in the classifier team can be identified to the exercise of power in the classification process. They are (a) the TD, (b) the head classifier, (c) senior classifiers, (d) junior classifiers, and (e) classifier trainees. Each status and social position of classifiers may conduct different social practices, play different roles in swimming classification and have different levels of using power in the classification group. However, the system of status of classifiers is established informally and it relies mainly on classifiers' experience, knowledge and reputation, and also on their positions allocated in the classifier team. As mentioned in the previous section, members in the social group have access to more resources and so they may have more power to control other members in the group and affect their behaviours and decisions.

In addition, the status of members of the classifier team affects their working load and responsibility. For example, the TD and the head classifier need to take care of the most important things, such as, coordination of classifiers' meetings, classification seminars, and actual classification before and during competition. On the other hand, they have higher status in the social group and have more power to decide most things occurring in the classification process. When classifiers and trainees interact with the TD and the head classifier, they must treat the latter as bosses (i.e., superior) in the disability swimming social system.

Regarding other members in the group, classifier trainees have less power than classifiers in the interaction of swimming classification. For example, they may not sign their names on the classification sheets even they sometimes conduct bench or water tests under the supervision of senior or junior classifiers. When trainees were told to do something by the TD, the head classifier, or senior classifiers, they did not have a lot of choices to negotiate it but simply needed to do it. When they could not make a decision in classification because of their status, they needed to ask classifiers and to obey their instructions and decision. Sometimes trainees' opinions were not fully respected even though they may share useful information with classifiers. In other words, trainees' decisions were not recognised as authorised decisions so that only a few classifiers may care for their comments. However, they did not need to take any responsibility for making mistakes in classification because they were regarded as learners. Generally speaking, most of the time trainees learned from classifiers and observed classification conducted by classifiers. Most trainees did not directly offer a lot of feedback to the social group and they contributed less to the social practices, but they finally wanted to be qualified as a classifier. Thus, trainees' status in the classification group may be lower and their classification knowledge, experience and authority may be weaker, because they need more from classifiers but they only provide a little.

As authorised classifiers, generally, they do not have a lot of limitations in doing things which relate to classification. For example, they can do evaluations, may be assigned to conduct an appeal or protest of classification, can attend classifiers' meetings, may be invited to the welcoming party which only important people for the competition can attend, and also use their identification cards to access most areas in the sporting venue. However, their behaviours may be restricted by the code of conduct of classifiers. For example, classifiers need to treat classification as confidential, they cannot reveal the detailed classification process and discussion among classifiers to the pubic and they cannot directly criticise other members of the classification group and their decisions. Otherwise, classifiers would be accused of disobeying classification rules and they would lose their qualifications as authorised classifiers. In the most serious case, classifiers could lose their authorisation and face permanent expulsion.

In swimming classification, interactions between swimmers and classifiers are dynamic and complicated. Consequently, power relations among those social actors are not fixed all the time. They depend on the context and classification situation. Generally speaking, classifiers have an authority to use their power in controlling the behaviors of swimmers and trainees during the classification process (Dahl, 1986). For example, classifiers dominate and control the classification process and swimmers need to follow the classifiers' instructions and arrangements to do something in bench and water tests because the classifier group controls the need of the athletic group (i.e., swimmers' classes). In addition, swimmers cannot participate in the discussion of classifiers and the decision-making process. Classifiers are fully empowered by SAEC-SW to decide swimmers' classes. This phenomenon indicates that swimmers in the classification interactions may be in more passive and subordinate positions. On the other hand, classifiers always play the main central role in the process. They may decide most social rules, group norms and routine actions in the social group.

Power, however, is a reciprocal relationship among social actors (Lukes, 1974; Shibutani, 1986). Although it seems that swimmers have the least power in the classification group, "dialectic of control" by the weakest members may be seen in the process (Cohen, 1989; Giddens, 1979). For example, swimmers may tell the head classifier that they do not like the attitudes of specific classifiers. Thus, the classifiers may be called by the head classifier and then be told that they treat swimmers badly and need to change their attitudes immediately. If those classifiers do not want to change the swimmers' classification, they may again be targets of complaint by the TD and the head classifier, and so they may not be invited to important championships in the future. Despite the lesser power of swimmers in the classification process, obviously, they still can protect their rights to some extent and even exert some control over those with established power relationships in the classification group.

Swimmers also have a degree of power to participate in the revision of the classification system. Whilst they are not invited to participate in the classifiers' meeting, they may present their opinions in the country's meeting (FN, 10/10/98, WSC). In particular, if swimmers could provide clear evidence to classifiers that the current classification system has a few problems, the TD, the head classifier and classifiers may consider their recommendations when the swimming classification system is planning being revised. Swimmers, however, do not play a significant role in the process of the revision of the classification system. On the other hand, classifiers can still keep their power to decide rules.

Generation of power and exercise of power among social actors relate to the resources used by them. Giddens (1984) argued that people who have access to more allocative and authoritative resources may better able to exercise power in social interactions and social practices. In swimming classification, classifiers have more expert knowledge and experience in classification than swimmers and trainees have, and also extensively use it in the production, reproduction and transformation of the classification system and the classification activities. Powerful classifiers dominate most of the social practices in the disability swimming social system and mostly have decision-making power to determine the classes for swimmers. Lukes (1997) had a clear interpretation on the concept of power.

> Power is the capacity to produce, or contribute to, outcomes- to make a difference to the world. In social life, we may say, power is the capacity to do this through social relationships: it is the capacity to produce, or contribute to, outcomes by significantly affecting another or others (p. 46).

Even if classifiers have more power than swimmers to control the classification process, classifiers' behaviours are limited to conduct appropriate classification practices so that the outcomes of classification may reach the expectation of social actors in the social system (Giddens, 1979). However, if classifiers do not exercise their power properly, the atmosphere in social interactions among the social actors may be nervous and abnormal. This can happen when certain classifiers choose not listen to swimmers' questions or reject questions from swimmers who expected to receive a lower classification. Perhaps rebellions of swimmers or, most seriously, conflicts among swimmers and classifiers may occur (see Sections 4.4 & 4.5.8).

4.5.6 Allocation of Rewards and Sanctions

Members of the classification group often follow classification norms because, as a result of socialization, it has become habitual for them to do so. All social norms are accompanied by rewards and sanctions that promote conformity and protect against non-conformity (i.e., deviance) (Giddens, 1993; Williams & Kolkka, 1998). In swimming classification, for example, junior classifiers and classifier trainees need to follow senior classifiers' instructions, conduct good evaluations, and obey classification rules (i.e., the classification system and the code of conduct of classifiers). If so, they may be praised by the head classifier and the TD. It includes saying "well done", or giving an appreciative smile, or offering a certificate to them (FN, 15/10/98, WSC). For junior classifiers, the extra reward is that they may be invited to the future international competition such as the European Championships, World Championships or Paralympic Games (R. Heruti, personal communication, January 1999). For classifier trainees, if they follow the classification norms and meet the standards of being authorised classifiers, the best reward is that they can be authorised to become SAEC-SW classifiers (IN, 14/10/98, WSC). Specifically, all senior classifiers in the classification group perform a gate-keeping function. They support, encourage, and promote classifier trainees who show that they can conform to expectations of the classification group.

Senior classifiers, however, may sanction junior classifiers and classifier trainees who do not adhere to the social norms and expectations of the classification group. This would include classifiers who do a lot of wrong classifications, do not obey the code of conduct of classifiers, do not follow proper classification procedures, have poor communications with classifiers and swimmers, or perform classification like non-professionals and outsiders. Sanctions for those behaviours include discouragement and punishment. Discouragements conducted by the head classifier, the TD and senior classifiers, such as speaking insultingly, scolding, physically shunning or avoiding talking to a given individual, are informal sanctions (FN, 9/10/98, WSC). However, they are fundamental in ensuring conformity to norms (Giddens, 1993; Williams & Kolkka, 1998).

In addition, more informal sanctions may be seen in the classification process. For example, classifier trainees may not be authorised after the classification seminar and so they need to pay by themselves or their sport organisations to attend more classification seminars in the future. For example, one classifier trainee felt that she conducted classification well and expected to get authorisation after the classification training. However, when she knew she was not authorised, she was very upset and did not know why she could not be authorised (FN, 16/10/98, WSC). Also, some informal sanctions were observed during the classification process. Classifiers do not verbally encourage or assign normal classification duty to those trainees who do not always follow classification norms. As a result, they are regarded as not ready for the minimal requirement of authorised classifiers (J. Buckley, personal communication, January 1999).

The formal sanctions (i.e., punishments) are usually more dramatic than informal sanctions (Giddens, 1993). For example, a classifier was charged with "racial discrimination" against Asian classifiers and trainees. Most classifiers think that this person should be formally sanctioned by IPC and SAEC-SW, according to the code of conduct of classifiers. In particular, they think that the person should not be an authorised classifier any more, even if having enough classification knowledge and experience (FN, 13/10/98, WSC). Although this situation seldom happens in swimming classification and the final decision for sanction of the classifier has not been made by IPC, this case will be a good example for classifiers and trainees to control their speech and behaviors.

Rewards and sanctions to swimmers in the classification process are not so obvious when compared to rewards and sanctions received by classifiers and trainees.

However, there are still a lot of examples to illustrate the concept. If swimmers follow and obey classifiers' instructions and try hard to do bench and water tests in classification, they are encouraged verbally by classifiers. In the following example, a medical classifier talked to a swimmer with CP during bench tests.

> You do very well and I know you try everything you can. I am very appreciative of your cooperation. Please keep going and let us see what you can do (FN, 5/8/97, ESC).

The swimmer was very happy by the encouragement of the classifier. During the evaluations, the classifier always had a smile and talked to the swimmer patiently and politely. Their interactions during the classification process were completely smooth and relaxed. Finally, the swimmer happily accepted the decision of the classifier team. No matter whether the swimmer wins or loses in competition later, this is a successful exercise in classification. Both classifiers and swimmers get benefits (e.g., feel comfortable) in the interactions.

Swimmers, however, may be sanctioned formally or informally in the classification process. In the observation study, for example, some classifiers may ask swimmers to stop talking in classification, especially when swimmers talked about other things not related to classification (FN, 13/8/96, PG). In addition, a few swimmers were prevented from taking a rest during classification even though they felt tired. Thus, swimmers may not reveal the real physical abilities and functions in classification.

Usually a few borderline swimmers are assigned into higher classes if classifiers think that those swimmers do not cooperate with them well. Although we may argue that honest swimmers may be penalised, actually, this action seldom makes mistakes because a lot of swimmers may not do their best and they just want to gain advantages in classification or save their energy for competition. One classifier explained

> If we classifiers put swimmers into higher classes and we prove that we make mistakes during observation and after reclassification, it is always easier to lower swimmers' classes and swimmers are always happy to accept our new decisions. On the other hand, if we mistakenly put swimmers into lower classes, it is very difficult at a later stage to then persuade swimmers to accept the new but higher classes and also we are unfair for other swimmers because those swimmers may have already won a lot of medals (FN, 12/10/98, WSC).

Generally speaking, there are very few swimmers who are really penalised by the classification system and classifiers because classifiers take this problem into account in the classification process.

There are some situations causing deviant swimmers to be punished. For example, according to the classification rules, swimmers must be classified by the authorised classifiers. If swimmers refuse to attend classification or refuse to sign classification sheets when the classifier team informs the classification results to them, they cannot compete in the IPC sanctioned championships (SAEC-SW, 1998).

In addition, if swimmers are observed cheating in classification, they will be severely punished according to the classification rules. They may be expelled from the competition and need to return any medals won. All records set by them would not be recognised by SAEC-SW (SAEC-SW, 1998). Sometimes dishonest swimmers may be changed to proper classes immediately without reclassification and they may be warned by the head classifier (FN, 7/10/98, WSC). However, they are still allowed to compete. One senior classifier stated:

> It is very difficult to prove that the swimmer cheats. If we classifiers cannot provide clear evidence to support our accusation, swimmers will be against us and then we will have big troubles. It is best not to use the word "cheating" to describe swimmers unless we really can prove it (FN, 15/8/96, PG).

The current classification system also develops a few rules for dealing with classification protests. If swimmers receive protests from the head classifier or from other countries, swimmers need to be reclassified on that same day. If swimmers refuse to attend reclassification, they will be asked to return their medals and may be changed to new classes for the remaining competitions (IN, 13/10/98, WSC; SAEC-SW, 1998). It seems that swimmers receiving protests do not have any excuse to refuse and avoid reclassification. However, every swimmer can only be protested against once after which they cannot be reclassified. Although the rule is strict, it also protects swimmers from tactical protests by other countries (Davis & Ferrara, 1996).

4.5.7 Roles Played by Classifiers in the Classification Process

Every member in the social group has a specific role. A role consists of the set of behaviours and functions required or expected of the person occupying a certain position in a group (Weinberg & Gould, 1995). For example, classifiers are expected to perform such functions as organising and conducting classification, performing correct evaluations, interacting with athletes and being fair people in any classification. Swimmers in classification are expected to listen to the instructions of classifiers and demonstrate their actual physical and functional abilities.

As mentioned before, classifiers control the entire classification process. Classifiers are so important that swimmers and many other people need to depend on their expertise. In this observation study, their roles in disability swimming can be specifically identified as the following: (a) conducting classification, (b) reducing the mistakes of classification and dealing with reclassifications in the cases of appeal and protest, (c) producing and reproducing classification systems, (d) educating classifier trainees, and (e) communicating with swimmers and coaches. Generally, a competent classifier is expected to achieve these goals, conduct classification practices appropriately, and play the role well.

If we consider the position of medical and technical classifiers in the classification group, their roles are not the same in spite of sharing similar goals-fairness of classification and competition. For example, medical classifiers are expected to have good medical knowledge and then use it properly in bench test. On the other hand, technical classifiers are not expected to control the procedures of physical evaluations. They are mainly expected to help medical classifiers write down results of bench tests on the classification sheets. However, technical classifiers need to fully control the process of functional evaluations but medical classifiers only play ancillary roles to assist technical people in this process. In other words, medical and technical classifiers need to play different roles in different classification processes. As a result, the classification team can achieve their expected goals in the disability swimming social system. Ideally, the expected functions of classifiers in disability swimming are thoroughly recognised and accepted by other members of the social group.

If the classification team is expected to work appropriately, members in the classifier team need to understand (i.e., role clarity) and accept their roles (i.e., role acceptance) (Weinberg & Gould, 1995). For SAEC-SW classifiers to fully understand and accept their roles, however, they need to be educated for several years. They not only understand what they need to do in classification, but also need to be familiar with the group norms and learn classification culture. Shibutani (1986) noted that direct participation in the social settings and learning to enact roles are the most appropriate ways to achieve it. The issue of socialization of classifiers will be discussed in the next chapter in great detail.

Classifiers sometimes have conflicts regarding the role-playing in the classification process. In other words, classifiers not only need to play their roles properly but also should never exceed them (SAEC-SW, 1998). For example, medical classifiers may try to ask for swimmers to perform some functions in the water test but technical classifiers may not be happy for medical classifiers' behaviours, because they may feel their duty is disturbed (FN, 4/8/97, ESC). On the other hand, a few medical classifiers may not like technical classifiers to interfere in their evaluations and challenge their decisions in terms of results of physical evaluations (FN, 5/8/97, ESC). Role-playing of classifiers, however, can be solidified by a proper education in the classification seminar and communication and negotiation among medical and technical classifiers before and after classification. Gradually, role conflicts in the classifier team may be reduced or avoided and classifiers can really understand what and when they should do and what roles they should play (FN, 5/10/98, WSC). Classifiers who do not reach the expectations of roles may be sanctioned. This issue has been discussed in the previous section (see Section 4.5.6).

4.5.8 Conflicts in the Classification Process

Giddens (1984) defined conflict as "struggle between actors or collectivities expressed as definite social practices" (p. 198). In swimming classification, a protest of classification may be regarded as a conflict between classifiers and swimmers. As described before (see Section 4.5.1), a few swimmers may want to gain an advantage in classification and competition so that they may not cooperate with classifiers very well. Thus, a protest of classification for those swimmers from the classifier team during the competition may prevent swimmers from using an illegal way to gain an advantage. However, when swimmers are protested during the competition, they may not feel comfortable because they need to be reclassified. Perhaps swimmers do not want to be reclassified again, but actually have no choice to reject the reclassification if they still want to compete in IPC sanctioned swimming championships, according to the classification rules (SAEC-SW, 1998). Thus, the head classifier needs to explain the rule and the procedures of reclassification clearly and carefully in order to avoid direct conflicts or arguments with swimmers or coaches, especially swimmers who still have to participate in some later events.

In addition, swimmers may have an appeal to their classifications which may relate to the issue of conflicts. Notably, swimmers can think that they should not be classified into higher and disadvantageous classes by classifiers. Some swimmers do not want to have to appeal but they do not understand why they are classified into specific classes. According to the classification rule, the head classifier is the only person who can give a detailed explanation to swimmers and coaches but usually he or she is busy during classification. Thus, it seems that making an appeal is the most suitable approach to protect their rights. An appeal, however, increases the workload of classifiers. The head classifier needs to arrange another classifier team to do the reclassification.

Strictly speaking, a protest or an appeal of classification may not be regarded as a big conflict between swimmers and classifiers. However, a serious conflict was seen in the international championships:

> A middle-aged swimmer was classified by three senior classifiers in an international championship, but she did not like the decision of the classifier team because the class was higher than her expectation. Firstly, she asked classifiers to lower her class but classifiers rejected her request and tried to explain the reasons why she should be in that class. However, the swimmer did not accept the explanation of classifiers and refused to sign the classification sheet. Then, the swimmer shouted to the classifier team and threatened to drop out from the competition. Classifiers still refused to change their mind. Suddenly, the swimmer was angry and left the classification room in tears. Classifiers were not happy by the impolite behaviour of the swimmer. They could not calm down immediately. Thus, the next classification was not conducted as a routine classification (FN, 1/6/96, BSC).

In this unusual case, swimmers and classifiers did not have good communication. Most swimmers do not understand the detailed contents of the classification system or have never read the classification manual, but they understand that they should compete with other swimmers in a specific class in terms of performance times. This swimmer did not think that she was able to compete with other swimmers in that class because she swam slowly and she definitely lost. She did not notice whether her physical or functional abilities were comparable or not with other swimmers in that class.

The next example is completely different from the previous one. However, it is also an example of a conflict among social actors.

> A swimmer with polio from a developing country was classified into a higher class than his expectation. His team manager did not like the decision of the classifier team. He asked one classifier if his swimmer could be classified again. The classifier rejected the request of the team manager. However, the classifier politely told the team manager that he could make a classification appeal or ask the head classifier questions if he wanted to know more information. The team manager found the head classifier but they only had a short conversation (about 20 seconds). Then, the team manager was asked to wait outside the classification room. Two hours later, the team manager still did not have an opportunity to talk to the head classifier and ask questions. He just sat there and swayed his head. It looked that he was complaining about something. One hour later the head classifier finally talked to the team manager (FN, 8/10/98, WSC).

This case may show that the team manager had less power to talk to the head classifier directly or the head classifier was too busy to remember the team manager who was waiting. If the former was true, why was the team manager subordinated to the head classifier? Why could the situation not be changed?

Currently, only the head classifier or the TD are the spokesperson for the classification process because classification issues are treated confidentially and seriously (SAEC-SW, 1998). However, the head classifier and the TD were always busy during the international championships. Thus, it was difficult that the team manager wanted to ask the head classifiers or the TD to clarify classification questions. I found that the head classifier was usually friendly and fairly to answer questions if he or she had free time (FN, 10/10/98, WSC; IN, 15/10/98, WSC).

Classifiers who do not use their power properly may be one of the reasons for conflicts in classification. Some conflicts are observable but some are latent (Lukes, 1997). For example, a senior classifier took the view that Asian people should not become classifiers or classifier trainees. She argued that (a) the medical training for physicians or physiotherapists in Asia was poor and (b) there were not a lot of good swimmers in that area and Asian countries. In other words, she did not think that Asian people had good abilities to conduct correct classification and do proper observation. This classifier raised an issue related to racial discrimination but could not provide any evidence to support her argument. However, most classifiers strongly disagreed with her points of view. A few classifiers even thought that she should not be a classifier according to the code of conduct of classifiers. Another senior classifier shared her comments on this situation.

> She just upsets people and us, especially when we work with her in the same classifier team. We classifiers come from different countries. If every classifier is like her, how is classification going on? If she always has this attitude to discriminate against other people, how can she treat every swimmer equally and fairly? She must be out. We cannot work with her any more. Swimmers and the classifier teams may be hurt because of her. She is not nice, is she (FN, 14/10/98, WSC)?

This may be the most serious conflict in the classifier group. Most classifiers did not want to talk to her since she said the discriminative thing and she did not apologise for the mistake. Even if classifiers met her, they did not say "hello" or smile and they just treated her as a stranger. Suddenly, this person became a complete outsider to the classification group. No one wanted to share any classification information with her. Her power and authority as a senior classifier was directly frozen. Her reputation in the classification group was regarded as poor.

In addition, minor conflicts between medical and technical classifiers sometimes occurred. However, most conflicts among them were "arguments" or "disagreements" of swimmers' classes. Outsiders may feel that arguments are one kind of conflict. In particular, some technical classifiers may raise the tone of their voice and have some active body movements when they talk to medical classifiers and trainees. Medical and technical classifiers may regard arguments as "routine" and an acceptable process in swimming classification. Most classifiers do not think those aggressive discussions are conflicts. They believe that those discussions benefit swimmers and classifiers, because classifiers can really clarify some problems and assign the most appropriate classes to swimmers. Nobody should be hurt in the process unless medical and technical classifiers argued ideological or philosophical things of classification (Rex, 1981). For example, a medical classifier challenged certain functional evaluations which were conducted by technical classifiers.

> You can see that technical people do functional tests too subjectively but they always try to persuade us (i.e., medical people) to accept their ideas. However, we medical people are more objective. At least, physical examinations undertaken by us are clearer and more consistent. I don't think it is objective when technical people adjust points in water test. ... I just want technical classifiers to know that they sometimes make mistakes because of their subjectivity. They sometimes need to listen to us (FN, 7/10/98, WSC).

Another medical classifier, however, presented completely different points of view.

> Technical people contribute a lot to swimming classification whether in the system or the evaluation. I learn a lot of disability swimming knowledge from them. I know the whole development of the functional swimming classification system. Since functional classification has been used in swimming, most swimmers like the system and they enjoy attending the high level of competition. In my opinion, I think water tests are more important than tradition bench tests although I am a medical classifier. But medical people can still contribute a lot to the classification system and evaluations. I don't think we only need either medical or technical people in swimming classification. Rather, we need both and we must work together. So far, we medical and technical people collaborate together very well and we seldom make mistakes in classification. I really enjoy working with technical people (FN, 10/8/97, ESC).

Thus, for some classifiers, they believe that those "acceptable" conflicts (i.e., arguments or disagreements) may contribute to the stability of the social system and the improvement of social practices. However, ideological arguments and normative disagreements may have a potential tendency to change the social system and social interactions among social actors (Rex, 1981). Consequently, social order in the social system may be disturbed, but later the new social order may be reconstructed and developed (Watkins, 1975).

Sometimes misunderstandings and poor communication among social actors result in arguments, disagreements or even conflicts (Rex, 1981). For example, some swimmers and coaches do not understand the contents of the classification system although SAEC-SW regularly sends the latest edition of the classification system to every IPC national member. It is believed that most people could not understand the professional and complicated classification system because a lot of classification knowledge and rules are written in the current swimming classification system, many specific medical and technical terms and classification knowledge are used in the system, and most countries do not have authorised classifiers to teach them. Thus, a misunderstanding or misinterpretation of the system may happen (IN, 18/8/96, PG). Some conflicts may be avoided, if SAEC-SW can regularly organise the educational programme for swimmers and coaches to understand basic classification concepts and also if classifiers patiently explain the classification results to them during the classification process (IN, 14/10/98, WSC).

4.6 Discussion

The principal aim of this study was to examine and identify the classification practices as a social process. To study social processes in the human society, Shibutani (1986) provided a good interpretation and guide:

> Life conditions are always changing, and human beings- individually and collectively- must adapt to the developing circumstances. Human society consists of a succession of adjustments and readjustments among associated people through which various patterns of concerted action are formed, maintained, dissolved, and reshaped. Change is continuous, but it may be slow or rapid. Sometimes it occurs so slowly that a community achieves the appearance of stability. A social process is a pattern of joint activity that occurs regularly over time, and the task of sociologists is to identify and describe such processes (p. 25).

In this study, social interactions were viewed as an ongoing process, and then social structures and practices in classification were identified and the general patterns among social actors in the swimming classification process were clarified. However, the issue of the social change (i.e., changes of the classification process and system) and the process for changes were mentioned briefly. This will be detailed in Chapter 7.

Disability swimming is conceptualized as a social system, and classification as a process that ensures pattern maintenance within the system (Williams & Kolkka, 1998). The disability swimming social system may have some practices and ideological links with rehabilitation, recreation and education. However, these are not as strong as might be expected with disability sports. Disability swimming classification is one of the main social practices and structures in disability swimming. The basic ideas for swimming classification and relevant social practices are to maintain the fairness of competition and also to enhance the strength of competition (Williamson, 1997). Thus, the sport model and the idea of "excellence of performance" are in particular emphasized in SAEC-SW under the umbrella of IPC (Steadward, 1996). On the other hand, the medical-based model is much weaker in the current social system.

The disability swimming social system, however, is still related to other parts of the larger societal systems. The other parts are the medicine, health, education and sport systems. Where swimming classification intersects with other systems in the interaction between swimmers and physicians and physiotherapists (i.e., medical classifiers), teachers and sport experts (i.e., technical classifiers), then cultural material passes into the swimming classification system. In other words, medical and sport knowledge of classifiers that are used in the classification process obviously affects the production, reproduction and transformation of the swimming classification system, social practices, and disability swimming social system. Williams and Kolkka (1998) stated that "cultural material can be incorporated via systematic adaptation mechanisms" (p. 365).

Clarification of the complexity of the classification process may help SAEC-SW organise and manage classifications better. For example, swimmers in the classification interaction may be treated passively. For most of the time senior classifiers use their power to control the entire process. If SAEC-SW does not notice it and some senior classifiers abuse their power and authority in the interactive process, it is predicted that some arguments and possible conflicts may still occur. SAEC-SW needs to properly empower classifiers so that professional authority of classifiers can still be maintained and the classification process can be run well. But most importantly, SAEC-SW also needs to control classifiers well so that the social order in disability swimming can be consolidated and the fairness of classification not be disturbed by their inappropriate practices and behaviours. Otherwise, the voices for social changes (i.e., changes of the classification system, classifiers and the classification process) from subordinates in the social group may be louder and louder eventually leading to a collapse of the classification tradition. As a result, instability of the disability swimming social system may happen but a new stable social order may take some time to be reestablished. If this really occurs, social actors (e.g., swimmers) may take a longer time to develop their confidence in the new social structure and social practices. I believe that SAEC-SW has the authority to prevent those negative problems and it should take relevant issues seriously.

In this observation study, several features in the swimming classification process were also identified. Social practices and interactions among the social actors are mainly affected by classifiers because they control and use authoritative resources in the process. Maybe there are some features that have not been revealed because more classifiers' points of view were used in this study. It will be better if future studies can balance viewpoints of classifiers and swimmers. Thus, the classification process may be interpreted as a whole. In this study the researcher is also an authorised classifier during the research process and must always stay in the classification areas to deal with classifications. Thus, it would be more difficult for him to directly collect data from swimmers. Other researchers could possibly interview more swimmers to identify their perspectives and find out missing concepts in this study.

Classification researchers should not only be concerned about the swimming classification system and conducting experiments in a laboratory to evaluate the system, but they also need to combine the empirical data which are collected in actual classification fields and listen to voices of social actors in classification. Thus, more views in the classification process could be clarified and more issues raised or identified. As a result, possible solutions may be developed to tackle the problems in the interactive process among social actors. This study has demonstrated the importance of participant observation in classification settings and an understanding of the complicated social process in the disability swimming social system. Maybe a similar approach of participant observation and sociological concepts can be used to identify and analyse other disability sports and their classification processes. Therefore, some classification issues could be clarified and then be overcome.

4.7 Summary and Conclusion

In this Chapter, classification as social processes and classification settings and several social interactions among the classification group were identified. The complicated classification process was contextized and separated into nine stages. They were (a) registration for classification and introductions among social actors, (b) bench test and physical evaluations, (c) water test and functional evaluations, (d) discussion among members of the classifier team, (e) explanation of classification results, (f) classification appeal, (g) observation during the competition, (h) protests against classification, and (i) meetings of classifiers. Each classification process was described and interpreted in this study.

In addition, the main interactions among members of the classification group could be recognised as being between (a) swimmers and medical classifiers, (b) swimmers and technical classifiers, and (c) medical and technical classifiers. Those social interactions among different social actors in different social contexts were described with empirical examples and were also analysed and discussed in order to clarify the features of the swimming classification process. In particular, eight features were identified and conceptualised in this study. They were (a) interaction among social actors, (b) routinization in the classification process, (c) rules in the classification process, (d) resources used by classifiers in the classification process, (e) power relations among social actors, (f) allocation of rewards and sanctions, (g) roles played by classifiers in the classification process, and (f) conflicts in the classification process.

As Shibutani (1986) discussed in his book, social lives are social transactions, day-to-day interactions among participants in the social group and communicative processes. To understand social norms and the social transactions as a social process and also to learn their social roles, participants needed to actively participate in already organised transactions. He stated

> Every day human beings are involved in all kinds of transactions in which coordination is achieved through various forms of discourse. Collective patterns of all sorts are shaped, dismantled, and reformed in such interchanges. If a transaction is completed successfully, the participants tend to repeat the same patterns when they encounter similar conditions. When a transaction is repeated successfully, the participants come to share common expectations. They can then approach the next transaction in a similar context with greater confidence (p. 145).

In disability swimming, classifiers and swimmers interact together and produce social practices and the classification culture. Giddens (1984) specifically argued that the meaning of the social world is constituted by the social actors. Rules and resources are recursively implicated in the production, reproduction and transformation of social systems and social practices.

In this study social interactions among members of the classification group were in particular interpreted. Generally speaking, I find that the swimming classification process is controlled well by senior classifiers so that the entire social order and classification routines can be maintained successfully. Specifically, rules and allocation of rewards and sanctions were effectively used in the process to control the conduct of social actors. In addition, authoritative resources were extensively used by authorised classifiers in the classification process. Although senior classifiers have authority and power to decide swimmers' classes and change the classification system and rules, their power may be restricted by the code of conduct of classifiers and their behaviors may be monitored by their superiors (e.g., the TD and the head classifier) and other members in IPC and SAEC-SW.

Things that occur in the social world, however, are not always positive and perfect. In this study, several negative conditions in the classification process were observed. For example, (a) conflicts occur in the classification process and the interactive process among social actors; (b) most classification processes are dominated and controlled by senior classifiers; (c) swimmers or classifiers may be sanctioned if they do not play their roles in the social group properly; and (d) swimmers do not have appropriate opportunities to discuss with classifiers or the head classifier when they do not like the results of classification. Thus, the one way communication may produce some misunderstandings. It is recognised that swimmers may be in passive and weak positions in the classification process.

Although problems are specifically identified in the study, it is necessary to think about whether they may affect the fairness of competition and enhance conflicts among social actors. For example, swimming classification is in general a classifier-centered system. It is often seen that swimmers and coaches misunderstand the classification process, procedures, and contents of the classification system. Thus, they need classifiers to clarify their questions and help them establish right classification concepts. As a result, some conflicts may be avoided and unnecessary classification appeals or protest can be reduced. I believe that developing an educational programme for swimmers, team managers and coaches to briefly understand the classification system, contents, classification procedures and relevant classification rules is important.

In addition, the classification process is more dominated by senior classifiers. Although senior classifiers currently control the swimming classification process quite well, sometimes they neglect the opinions of swimmers, coaches, junior classifiers and classifier trainees (FN, 15/8/97, ESC). Uneven power may result in poor communication and greater misunderstandings such as classification appeal and unnecessary challenges (e.g., Bailey, 1998a, 1998b). Perhaps senior classifiers could share part of their power with swimmers and other relevant members of the classification group, such as in more active participation in the classification process. This may help classifiers handle the classification process more smoothly and successfully. Most importantly, less conflicts and misunderstandings among members of the social group can be expected. It is believed that classification does not need to be such a difficult and controversial area in disability sport.

Although the current classification process is not perfect, I find it is going well and the outcome of classification is satisfactory for most swimmers and classifiers. Do we, however, need to consider the social changes of the system and its structure? In this study, the tendency for big changes is not obvious because classifiers still work hard to revise the classification system at the classifiers' meeting and they regularly discuss relevant issues concerning the classification system, process, and quality of classification and classifiers. It can be observed that they are improving in every international swimming championship (FN, 15/10/98, WSC). Thus, the voices for significant social change in the classification practices have not been heard since 1994 and also more swimmers put their confidence on SAEC-SW and its classification.

Although this study used swimming classification as an example to illustrate the classification process as a social process, more research is needed to identify and clarify other classification themes such as the relationship between social order and social control in social system disability swimming. What roles should classifiers play in swimming classification? How do people become classifiers? How is socialization of classifiers accomplished? How do classifiers maintain their authority to control the social system? Those relevant questions will be explored in the next chapter.

Questions on whether other disability sports (e.g., wheelchair basketball, wheelchair rugby, table tennis, track and field) have similar classification processes and social interactions among social actors, and their social systems are constructed or transformed by the similar process need to be investigated and compared. I hope that the exploration of the swimming classification process can help us understand the social structure, social practices and disability swimming social system in greater depth, and also help us think about the extensive problems that exist in the actual social interactions, and finally develop appropriate solutions to classification problems. Most importantly, the ideas and concepts of this study may be used to examine classification processes in other disability sports. Some adjustments, however, are necessary. Thus, more classification research may be stimulated and then more findings may be applied in actual classification practices. In the next Chapter, the important social actors (i.e., classifiers) in the classification practices will be examined in detail. It is centered on the examination of (a) the characteristics of SAEC-SW classifiers, (b) resources used by SAEC-SW classifiers in classification, (c) the socialization process of classifiers, and (d) structural domination in disability swimming.

CHAPTER 5

CLASSIFIERS AS AGENTS OF SOCIAL CONTROL IN DISABILITY SWIMMING

5.1 Introduction

The problem of social order in disability sports centres on equity and differential performances resulting from impairments. Variations in the type and severity of impairment can produce relative performance advantages to some athletes and relative disadvantages to other athletes (Richter, et. al., 1992). For example, differences in trunk function produce differences in court mobility in wheelchair basketball (Coubariaux, 1996; Strohkendl, 1986); differences in hand function produce differences in ball control in wheelchair rugby (IWRF, 1996); the presence or absence of a hand produces differences in propulsion in swimming (SAEC-SW, 1998). Given the effects of these differences on performances, the problem for disability sports is how to maintain social order and how to achieve a degree of organisation and regulation consistent with the moral and political principles of fair competition.

In disability swimming, the problem of social order is resolved through the application of a system of classification. The Sport Association Executive Committee Swimming (SAEC-SW) of the International Paralympic Committee (IPC) has established a system of authority and a regulatory system of categorization to ameliorate the effects of individual differences, resulting from impairments, on swimming performances. A process of examination and evaluation identifies individual differences and assigns a swimmer to one of ten S classes for freestyle, backstroke and butterfly events and to one of nine SB classes for breaststroke events (SAEC-SW, 1998). Individuals compete only against the other swimmers in their assigned class. The classification system has been developed to ensure that every race is a fair competition. Without such positive social control swimmers with less severe impairments would always win swimming events.

One of the crucial elements of formal social control in disability swimming is the role of classifiers. Classifiers have been responsible for both developing and now applying the system of classification. However, while their importance has been recognised by several researchers (e.g., McCann, Davis, & Richter, 1994; Richter, et al., 1992; Shepherd, 1990), the issues of classifiers have not been the focus of any empirical studies. Indeed, Shepherd (1990) has called for the examination of the backgrounds and characteristics of classifiers.

In this exploratory study the role of classifier as agents of social control in disability swimming is examined. It was seen in Chapter 4 that the classification process is an exercise of positive social control and classification is a context in which relations of domination and subordination are routinely socially produced and reproduced. In this study, the examination is centred on three themes: (a) the resources used by classifiers to maintain and transform the SAEC-SW system of authority; (b) the socialization of classifiers as agents of social control in disability swimming; and (c) patterns of structural domination.

5.2 Method

The study had two distinct phases for data collection. First, it was necessary to identify, catalogue and structure background information on the process of swimming classification. Thus, the researcher attended a number of major swimming events to observe the classification process (see Section 4.2 and Table 3.2). The long-term observation was to identify the interactions between classifiers and among classifiers throughout the classification process. The detailed process was reported in Chapter 4.

Second, a questionnaire was used to collect information on a number of variables identified as relevant during the initial observation phase. The detailed procedures for data collection are described in the following section.

5.2.1 Participants of the Survey Study

A letter was sent to the IPC swimming chairperson explaining the research study and asked for help to obtain the lists of SAEC-SW classifiers. The addresses of all 21 SAEC-SW classifiers were received in June 1997. Eighteen SAEC-SW classifiers agreed to participate in the study. Twelve participants were identified as medical classifiers and six participants identified as technical classifiers. The mean age of SAEC-SW classifiers was 41.72 years. The age range was 29 to 69 years. The demographic information of participants is given in Table 5.1.

5.2.2 The Questionnaire and Procedures

A questionnaire (i.e., survey of international swimming classifiers) was developed based on previous reading and classification experience of the researcher in swimming classification. It was constructed in May and June 1997. The contents of the questionnaire were divided into two sections.

First, the classifier's demographic information included name, gender, age, nationality, languages spoken, impairment, educational background, and occupation. Second, classification information included medical and sport experience, previous sports qualification, classification experience and knowledge, resources used by classifiers for learning classification, and some questions relevant to swimming classification. Thirty-four questions in the survey were developed in all. Most questions were designed as closed questions. A few questions, those concerning the rationale of swimming classification and asking the opinions of classifiers, were designed as open-ended questions.

Questions regarding classification knowledge of classifiers were divided into medical knowledge and swimming knowledge. Specifically, medical knowledge questions were divided into seven main categories. They were (a) understanding characteristics of physical impairments of swimmers, (b) understanding diagnosis of specific impairments, (c) understanding the purposes and meanings of physical evaluations, (d) choosing appropriate physical evaluations for swimmers, (e) performing physical evaluations and bench tests, (f) using appropriate medical terms in swimming classification, and (g) understanding the limitations of physical abilities in specific impairments. On the other hand, swimming knowledge questions were categorised into (a) understanding swimming skills, (b) distinguishing the movement quality of swimmers' skills, (c) predicting swimmers' potential abilities and functions, (d) guiding swimmers to perform different swimming skills, (e) understanding swimmers' technical problems, (f) analysing movement patterns of swimmers with specific impairments, (g) distinguishing the differences of swimmers' abilities between classes, and (h) suggesting to swimmers how they may compensate for their technical problems.

In June 1997, a pilot study was conducted to enhance the validity of the questionnaire. Face validity of the questionnaire was established by using experts made up of two SAEC-SW senior classifiers (classification experience over 5 years) and one sport sociologist who reviewed all research questions and tested the clarity of language and meanings. All comments and feedback from these three experts were used to revise the questionnaire. The revised questionnaire is shown in Appendix B. In addition, the introductory letter enclosed when the questionnaire was given to SAEC-SW classifiers. It is in Appendix A.

The study was conducted from July to November in 1997. The questionnaires were distributed either at two international swimming Championships, or by mailing the questionnaire to classifiers. Eight SAEC-SW classifiers completed the questionnaire at the 1997 International Stoke Mandeville Games in July and at the 1997 European Swimming Championships in August. In late August, the swimming questionnaire was sent together with stamped envelopes or international postal coupons were enclosed to the rest of the SAEC-SW classifiers who did not participate in those Championships. Before September 1997, 17 international swimming classifiers had completed the swimming questionnaire. In October 1997, a follow-up letter was sent to four swimming classifiers who had not replied to the questionnaire. One swimming classifier returned the questionnaire in November, but three swimming classifiers (two medical classifiers and one technical classifier) failed to return it.

5.2.3 Clarification of the Return Rate and Credibility of the Survey Study

To enhance the external validity and credibility of a survey study, researchers always try to increase the return rate from survey samples (Fowler, 1993; Portney & Watkins, 1993). The return rate of the study was 85.7%. This is obviously higher than the 30% to 60% return rate in most survey studies (Portney & Watkins, 1993). There were several reasons for the high return rate of this study. First, most SAEC-SW classifiers knew the researcher quite well and so they were pleased to complete the questionnaire that was sent or given to them face-to-face. Second, stamps or international mail coupons were enclosed with the questionnaire when it was mailed and so they did not need to pay for the postage. Third, the questionnaire was designed as simply as possible. There were 8 pages and 53 questions in the original questionnaire. After it had been revised three times, the final edition was 6 pages and 34 questions. One classifier specifically mentioned that "it just took me about 10 minutes to finish all questions. It was simple, clear, and easy to answer." Fourth, the researcher promised to treat classifiers' data confidentially and so classifiers had greater confidence in completing the questionnaire. Fifth, most SAEC-SW classifiers believed that the issue of classifiers was important. There was a need to let swimmers, coaches, researchers, and classifier trainees understand their backgrounds. As a result, they were highly motivated to complete the questionnaire and return it to the researcher.

Table 5.1 Gender, Impairment, Geographic Areas, and Language Spoken of SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total (%) (n=18)
Gender			
Females	6	2	8 (44.4%)
Males	6	4	10 (55.6%)
Impairment			
Yes	1	1	2 (11.1%)
No	11	5	16 (88.9%)
Geographic area			
Asia	1	0	1 (5.6%)
Europe	8	2	10 (55.6%)
North America	2	2	4 (22.2%)
South America	0	1	1 (5.6%)
South Pacific	1	1	2 (11.1%)
Language spoken			
One	2	3	5 (21.4%)
Two	3	1	4 (22.2%)
Three	6	2	8 (44.4%)
Four	1	0	1 (5.6%)
Speak English			
Yes	12	6	18 (100%)
No	0	0	0 (0%)

5.2.4 Statistical Analysis

The Statistical Package for the Social Sciences (SPSS for Windows, Release 7.0) was used to analyse the data. Descriptive analyses were run for frequency and percentage distributions of nominal and ordinal variables, and for means and standard deviations of interval variables. Chi-square statistical analyses and independent samples t-tests were conducted to analyse differences between medical and technical classifiers in demographic data and swimming classification information. A separate paired samples t-test was used to analyse the differences between medical and swimming knowledge in separate medical, technical, and total classifier groups. An alpha level of .05 was accepted for statistical significance in this study.

5.3 Results and Discussion

It is readily apparent that classification occurs within the formal system of authority of SAEC-SW. If a swimmer with an impairment wishes to compete in a competition organised and sanctioned by SAEC-SW, then he or she must be classified (SAEC-SW, 1998). Over many years, SAEC-SW has established procedures through which differences between swimmers can be identified and developed specific criteria by which similarities among the differences enable swimmers to be grouped together for the purposes of competition. Within this formal system, classifiers are the agents designed by SAEC-SW to organise the classification process and regulate competition through the application of the evaluative criteria. Classifiers utilise the authority of SAEC-SW to control swimming competition but probative force of this authority is weak without the use of resources other than the power allocated by SAEC-SW.

5.3.1 Resources Used by Classifiers

The role of classifiers draws on a number of resources. They can be categorised into (a) classification knowledge of classifiers, (b) professional knowledge of classifiers, (c) classification experience of classifiers and (d) sport experience of classifiers. They are each discussed in detail as follows.

5.3.1.1 Classification knowledge

The most important resource for classifiers to play their role properly in the classification group depends on their expert knowledge. It is apparent that medical knowledge and swimming knowledge was extensively used by SAEC-SW classifiers in the classification process. In particular, medical classifiers used a lot of medical knowledge and physical examinations in bench tests and technical classifiers used a lot of swimming knowledge in water tests. The categorised classification knowledge of medical and technical classifiers is given in Tables 5.2 and 5.3. Most medical classifiers thought that their own medical knowledge was "very good" or "good", and most technical classifiers thought their own medical knowledge used in swimming classification was "good". There were significant differences between medical and technical classifiers in the items of "understanding characteristics of physical impairments" and "performing physical evaluations and bench tests" ($p < .05$) (see Table 5.2).

In addition, most technical classifiers thought their swimming knowledge was "very good" or "good" although one technical classifier responded with only a "satisfactory" for the item on predicting swimmers' potential abilities and functions and the item on distinguishing the differences of swimmers' abilities between classes. The answers of medical classifiers in swimming knowledge were varied. Some medical classifiers thought their swimming knowledge was "very good" or "good", some "satisfactory", and a few thought their swimming knowledge was "poor". There were significant differences between medical and technical classifiers with respect to "guiding swimmers to perform different swimming skills" and "giving suggestions to compensate swimmers' technical problems" ($p < .05$) (see Table 5.3).

When the medical and swimming knowledge of classifiers was quantified (i.e., very good = 1, good = 2, satisfactory = 3, poor = 4), the perceived classification knowledge score is reported in Table 5.4. The mean scores of perceived medical knowledge in medical and technical classifier groups were 1.26 and 1.76 respectively. There were significant differences in total perceived medical knowledge scores and average perceived medical knowledge scores between medical classifiers and technical classifiers ($p < .05$). On the other hand, the mean scores of perceived swimming knowledge in medical and technical classifiers were 2.39 and 1.46, respectively. There were significant differences in total perceived swimming knowledge scores and average perceived swimming knowledge scores between medical classifiers and technical classifiers ($p < .05$). This indicates that medical classifiers have better medical knowledge than technical classifiers. However, technical classifiers have better swimming knowledge than medical classifiers.

It is also recognised that medical classifiers need swimming knowledge and technical classifiers need medical knowledge so that medical and technical classifiers can collaborate and communicate with each other well in the classification process. Although medical classifiers thought that their technical knowledge was less well than their medical knowledge, they still needed swimming knowledge to some extent. The opposite pattern occurs in technical classifiers. Technical classifiers claimed better swimming knowledge than medical knowledge. However, they thought that their medical knowledge used in the classification process was "good" or "satisfactory".

It needs to be stressed that SAEC-SW classifiers whether medical or technical need both medical and swimming knowledge. Although medical classifiers need to control the bench test and have more opportunities to use medical knowledge in swimming classification, technical classifiers also need to understand medical terms used in the evaluation, basic characteristics of different types of physical impairments and meanings of physical evaluations for swimmers. Thus, they can cooperate well in bench tests. In addition, technical classifiers control the water test and use a lot of swimming knowledge in functional evaluations. Medical classifiers still need to understand basic swimming knowledge and try to combine the concepts of physical and functional evaluations in classification. Otherwise, medical and technical classifiers may not have a common classification language and then the goal of functional classification in swimming may not be achieved well. Perhaps conflict among technical and medical classifiers may occur leading to the unsatisfactory outcomes of swimming classification. If this continuously happens, the structure of SAEC-SW and its classification committee will be challenged and SAEC-SW classifiers may lose their reputation. Finally, social order in disability swimming would be problematic.

5.3.1.2 Professional knowledge

The second resource that helps classifiers to play their role in the classification process is related to their professional knowledge. This in particular interlocks with the occupations of classifiers and their educational backgrounds and qualifications (see Table 5.5). Medical classifiers need to be physicians or physiotherapists and also have educational backgrounds related to medicine or physiotherapy. Technical classifiers, however, need to have a background in swimming coaching or physical education. SAEC-SW may assume that medical classifiers already have enough medical knowledge to use in classification and technical classifiers are assumed to have swimming knowledge (SAEC-SW, 1998). Thus, when medical or technical people want to learn classification, medical classifier trainees may not need to spend a lot of time learning basic medical knowledge and practicing basic physical evaluations and technical classifier trainees may not need to spend a lot of time learning basic swimming knowledge and swimming skills. Trainees can focus on learning "classification" knowledge and its relevant practices. However, even trainees who already have professional knowledge and experience still need a lot of actual classification experiences and need to participate in the social interactions with other social actors (e.g., swimmers, classifiers, and coaches) so that they may be socialized to play their role well (see Chapter 4, Section 4.5.7).

5.3.1.3 Classification experience

The actual classification experience of SAEC-SW classifiers is very important to allow them to conduct appropriate classifications and control the classification process. It is relevant to (a) years of classification which they participate in national and international classification, (b) the number of swimmers classified by them, and (c) their opportunities to classify swimmers.

In this study the mean number of years of their classification is shown in Table 5.6. The time for which classifiers have been authorised by SAEC-SW ranged from 0 to 12 years, with a mean of 5.33 years. Swimming classifiers had participated in national classification from 2 to 15 years, with a mean of 7.22 years. Classifiers had been involved in international classification from 2 to 12 years, with a mean of 6.67 years. Although the means of years for medical classifiers were more than those of technical classifiers, there were no significant differences in these three levels of classification experience between medical and technical classifiers.

The number of swimmers who were classified by SAEC-SW classifiers is reported in Table 5.7. The result revealed that all SAEC-SW classifiers have classified more than 100 swimmers. In particular, four senior classifiers (three medical and one technical classifiers) have already classified over 500 swimmers. Those senior classifiers who have classified many swimmers conducted classification much more quickly and smoothly than junior SAEC-SW classifiers (J Buckley, personal communication, October 1998). It is believed that classification experience is very useful and important for classifiers in controlling the classification process well and effectively.

To be authorised as a SAEC-SW classifier, trainees may follow the pattern. First, they showed their interest in classification and then they may have participated in national classification to gain some experience. Second, they participate in international classification and register as SAEC-SW medical or technical classifier trainees. When they have had more classification experience and have shown their classification abilities and knowledge in international classification, they may be recognised and authorised as medical or technical classifiers by SAEC-SW. However, this is always a long process (i.e., over three years) to become an authorised SAEC-SW classifier. For example, if a classifier trainee went to an international competition and worked with medical and technical classifiers, a classifier team may classify about 10 to 15 swimmers every day. In a common two-day classification before international swimming competition, a classifier team may totally classify 20 or 30 swimmers. To classify at least 100 swimmers, classifier trainees may need to attend five or more times at international championships or attend many national championships. Thus, they may have enough classification knowledge, experience and abilities to evaluate swimmers with different types of impairments, with different severities, and with different swimming levels. When a classifier trainee has more confidence and is competent to use the Functional Classification System to achieve the high quality of swimming classification, the trainee is ready to be authorised as a SAEC-SW classifier. Being an authorised classifier carries with it not only a reputation in disability swimming but also a responsibility to take care of swimmers and maintain the fairness of competition (A. Green, personal communication, November, 1998).

5.3.1.4 Sport experience

The sport experience of SAEC-SW classifiers may contribute to the classification process and discussions among classifiers. In this study, the qualifications of SAEC-SW classifiers in swimming coaching and teaching are shown in Tables 5.8 and their coaching and teaching experience is given in Table 5.9. Five out of six technical classifiers (83%) had a coaching certificate, but only 4 out of 12 medical classifiers (33%) had one. There was a significant difference in having the coaching certificate between medical classifiers and technical classifiers, $\chi^2(1, \underline{N} = 18) = 4.00$, $\underline{p} < .05$. The mean of the number of years coaching for technical classifiers was significantly higher than that of medical classifiers ($\underline{p} < .05$). Seven medical classifiers (58%) and five technical classifiers (83%) had swimming teaching certificates.

Although the mean of the number of years teaching for technical classifiers was higher than that of medical classifiers, there was no significant difference between them.

Some medical classifiers mentioned they used to be swimmers. They emphasized that their previous swimming experience (e.g., competition and training) helped them understand water tests and swimming skills although they were not swimming coaches. Thus, it could be easier for them to combine their medical and swimming knowledge and experience in classification. Most importantly, they understood the values of high level competition and the meaning of sport-specific classification instead of only an emphasis of medical evaluations in classification (Craven, 1990; Steadward, 1996).

Table 5.2 Perceived Medical Knowledge of SAEC-SW Classifiers

Knowledge	Group: Medical classifier (n=12)	Technical classifier (n=6)	Total (%) (n=18)
Characteristics of physical impairments *			
Very good	10	2	12 (66.7%)
Good	2	4	6 (33.3%)
Satisfactory	0	0	0 (0%)
Diagnosis of specific impairments			
Very good	9	2	11 (61.1%)
Good	3	3	6 (33.3%)
Satisfactory	0	1	1 (5.6%)
Purposes and meanings of physical evaluations			
Very good	9	2	11 (61.1%)
Good	3	4	7 (38.9%)
Satisfactory	0	0	0 (0%)
Choosing appropriate physical evaluations			
Very good	9	1	10 (55.6%)
Good	2	4	6 (33.3%)
Satisfactory	1	1	2 (11.1%)
Performing physical evaluations and bench tests *			
Very good	8	1	9 (50.0%)
Good	4	5	9 (50.0%)
Satisfactory	0	0	0 (0%)
Medical terms used in classification			
Very good	10	2	12 (66.7%)
Good	2	3	5 (27.8%)
Satisfactory	0	1	1 (5.6%)
Limitations of physical abilities in specific impairments			
Very good	9	3	12 (66.7%)
Good	2	3	5 (27.8%)
Satisfactory	1	0	1 (5.6%)

Note. * $p < .05$ in chi-square tests between medical classifier group and technical classifier group.

Table 5.3 Perceived Swimming Knowledge of SAEC-SW Classifiers

Knowledge	Group: Medical classifier (n=12)	Group: Technical classifier (n=6)	Total (%) (n=18)
Swimming skills			
Very good	4	4	8 (44.4%)
Good	4	2	6 (33.3%)
Satisfactory	4	0	4 (22.2%)
Distinguishing the movement quality of swimmers' skills			
Very good	2	4	6 (33.3%)
Good	6	2	8 (44.4%)
Satisfactory	4	0	4 (22.2%)
Predicting swimmers' potential abilities and functions			
Very good	3	3	6 (33.3%)
Good	2	2	4 (22.2%)
Satisfactory	6	1	7 (38.9%)
Poor	1	0	1 (5.6%)
Guiding swimmers to perform different swimming skills *			
Very good	2	3	5 (27.8%)
Good	1	3	4 (22.2%)
Satisfactory	9	0	9 (50.0%)
Swimmers' technical problems			
Very good	2	3	5 (27.8%)
Good	3	3	6 (33.3%)
Satisfactory	5	0	5 (27.8%)
Poor	2	0	2 (11.1%)
Analysing movement patterns of swimmers with specific impairments			
Very good	3	4	7 (38.9%)
Good	4	2	6 (33.3%)
Satisfactory	5	0	5 (27.8%)
Distinguishing the differences of swimmers' abilities between classes			
Very good	3	3	6 (33.3%)
Good	5	2	7 (38.9%)
Satisfactory	3	1	4 (22.2%)
Poor	1	0	1 (5.6%)
Suggestions to compensate swimmers' technical problems *			
Very good	1	4	5 (27.8%)
Good	1	2	3 (16.7%)
Satisfactory	7	0	7 (38.9%)
Poor	3	0	3 (16.7%)

Note. * $p < .05$ in chi-square tests between medical classifier group and technical classifier group.

Table 5.4 Perceived Classification Knowledge of SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total classifier (n=18)
Medical knowledge	8.83±2.92 *, & (7-15)	12.33±3.50 (7-16)	10.00±3.46 & (7-16)
Average medical knowledge	1.26±0.42 *, § (1-2.14)	1.76±0.50 (1-2.29)	1.43±0.49 § (1-2.29)
Swimming knowledge	19.08±5.82 * (8-28)	11.67±4.32 (8-18)	16.61±6.35 (8-28)
Average swimming knowledge	2.39±0.73 * (1-3.5)	1.46±0.54 (1-2.25)	2.08±0.79 (1-3.5)

Note. Mean±SD (Minimal-Maximal).

* $p < .05$ in independent samples t-test between medical classifier group and technical classifier group in medical or swimming knowledge.

& $p < .05$ in paired t-test between medical knowledge and swimming knowledge in the same group.

§ $p < .05$ in paired t-test between average medical knowledge and average swimming knowledge in the same group.

Table 5.5 Highest Educational Achievement, Educational Fields, and Occupations of SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total (%) (n=18)
Education			
High school	0	1	1 (5.6%)
Diploma	2	2	4 (22.2%)
Bachelor	7	1	8 (44.4%)
Master	2	2	4 (22.2%)
PhD	1	0	1 (5.6%)
Educational field			
Coaching	0	1	1 (5.6%)
Physical education	0	4	4 (22.2%)
Medicine	6	0	6 (33.3%)
Physiotherapy	6	0	6 (33.3%)
Others	0	1	1 (5.6%)
Occupation			
APE	0	1	1 (5.6%)
Coach	0	3	3 (16.7%)
Physical educator	0	1	1 (5.6%)
Doctor	6	0	6 (33.3%)
Physiotherapist	6	0	6 (33.3%)
Others	0	1	1 (5.6%)

Note. APE: adapted physical educator.

Table 5.6 Classification Years of SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total classifier (n=18)
Authorised year	5.42±4.40	5.17±2.86	5.33±3.87
	(0-12)	(2-8)	(0-12)
National year	7.58±3.45	6.50±2.26	7.22±3.08
	(2-15)	(2-8)	(2-15)
International year	7.17±3.38	5.67±3.61	6.67±3.43
	(2-12)	(2-11)	(2-12)

Note. Mean±SD (Minimal-Maximal).

Table 5.7 Classification Number of Swimmers by SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total (%) (n=18)
Classification number			
Below 100 swimmers	0	0	0 (0%)
101-200 swimmers	3	1	4 (22.2%)
201-300 swimmers	4	3	7 (38.9%)
301-400 swimmers	0	1	1 (5.6%)
401-500 swimmers	2	0	2 (11.1%)
Over 500 swimmers	3	1	4 (22.2%)

Table 5.8 Swimming Coaching Certificate and Teaching Certificate of SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total (%) (n=18)
Coaching certificate			
Yes	4	5	9 (50.0%)
No	8	1	9 (50.0%)
Teaching certificate			
Yes	7	5	12 (66.7%)
No	5	1	6 (33.3%)

Table 5.9 Years of Coaching and Teaching of SAEC-SW Classifiers

	Group		
	Medical classifier (n=12)	Technical classifier (n=6)	Total classifier (n=18)
Coaching year (years)	4.25±6.52 **	18.00±8.37	8.83±9.62
	(0-16)	(10-30)	(0-30)
Teaching year (years)	7.67±9.36	17.00±10.33	10.78±10.42
	(0-32)	(0-30)	(0-32)

Note. Mean±SD (Minimal-Maximal).

* $p < .05$ in independent samples t-test between medical classifier group and technical classifier group.

** $p < .01$ in independent samples t-test between medical classifier group and technical classifier group.

5.3.2 Socialization of Classifiers

Socialization is one of the important sociological concepts in sport (Coakley, 1994; Nixon & Frey, 1996). A definition of socialization used in this study is

> the process by which we acquire the culture of the society into which we are born- the process by which we acquire our social characteristics and learn the ways of thought and behaviour considered appropriate in our society ... When individuals, through socialization, accept the rules and expectations of their society that make up its culture and use them to determine how they should act, we say they have *internalised* society's cultural rules (Bilton, et al., 1987; quoted in Williams, 1994, p. 15).

When the concept of socialization is used in disability sports and in particular in classification, the socialization experiences of classifiers will be specifically emphasized. Because SAEC-SW classifiers have access to more resources (see Section 5.3.1), they may have more power to control the swimming classification social system and classification process (see Chapter 4) and also influence the fairness of competition. Many people in disability sports may be very interested in an understanding of the socialization process of classifiers.

The authority of SAEC-SW classifiers is strengthened by the several ways in which classifiers are socialized as agents of social control. First, an apprenticeship system ensures the maintenance of standards of application. SAEC-SW has designed an appropriate training system for people who want to become classifiers (SAEC-SW, 1998). It included people need to attend at least two international classification seminars in the Functional Classification System, conduct actual practical classification for swimmers with various types of physical impairments, and have good communications with other classifiers, trainees and swimmers. A mentor system is also applied in the training programme to support learners. For example, each classifier trainee is supervised by a senior classifier. The senior classifier needs to teach classification evaluations, to monitor the progression and to identify the weaknesses of classifier trainees (SAEC-SW, 1998). Generally speaking, senior classifiers can be regarded as the primary agents in the socialization process of swimming classification.

Second, the long-term participation in the actual classification setting is the most appropriate way to learn the classification culture and understand the social interactions in the classification group. When classifier trainees are familiar with the classification process and classification system, can conduct appropriate classification, have enough classification experience, have good communications with senior classifiers and swimmers and can stay at the classification group without difficulties, they may be ready to be authorised as SAEC-SW medical or technical classifiers. However, it is always a long process (Steadward, 1996).

Third, other significant social agencies or agents may help classifiers learn their social roles in the classification group (see Table 5.10) (Nixon & Frey, 1996; Williams, 1994). For example, discussions with swimmers and coaches may help classifiers and trainees learn classification. In particular, swimmers and coaches may point out some problems which classifiers may not notice during the classification process. However, as discussed before (see Chapter 4), misunderstandings of swimmers and coaches in the classification system may affect classifiers and trainees. Thus, in the socialization process classifiers and trainees need to expand their learning opportunities, but on the other hand they may need to use their experience to distinguish and discard "deviant" values which may be produced by other social agents and agencies. Otherwise, if classifiers or trainees often behave deviantly in the classification process, they may be sanctioned by SAEC-SW.

Fourth, regular and frequent discussions among classifiers gives a transformative capacity to the role of classifiers (Shibutani, 1986). During the international swimming competition (e.g., the Paralympic Games, World Championships and European Championships), SAEC-SW classifiers not only deal with the fairness of competition but they also need to have regular meetings to discuss problems in the classification process and system. When problems are clarified and then new solutions are developed, SAEC-SW classifiers need to adjust their role and practical actions so that the outcomes of classification may be improved. In addition, senior classifiers often use mail, e-mail or fax for communication and discussion if they want to clarify some classification problems and also listen to each classifier's comments. Thus, more crucial decisions to transform swimming classification can be made carefully. We must notice that the role of SAEC-SW classifiers is not only to conduct classification correctly but also to regularly monitor and revise the classification system and process. Therefore, the authority of SAEC-SW can be consolidated and social order in swimming classification can be maintained (Watkins, 1975). Most importantly, the fairness of swimming classification may be fulfilled.

5.3.3 Patterns of Structural Domination

There is a concentration of social control in disability swimming that is influenced by language and culture (Watkins, 1975). The use of English as a global operating language is one of the dominant patterns. For example, all of 18 SAEC-SW classifiers reported that they can speak English. Although 12 classifiers replied that they can speak over two languages (see Table 5.1), they in general use English to communicate with swimmers or their translators in the classification process. In addition, in the interactions of classification between medical and technical classifiers, it seems necessary to use a common language such as English for better communication. Medical and technical classifiers always need to work together so that good communication between them is the first priority in the interactive process. However, it may not be appropriate when an authorised classifier cannot speak English and always needs the help of a translator. The quality and efficiency of classification may not be satisfactory. In the classification manual, SAEC-SW noted that authorised classifiers need to use English as the official language in international classification (SAEC-SW, 1998).

The dominance of European classifiers in disability swimming is apparent (see Table 5.1). With regard to the geographic areas of SAEC-SW classifiers, there were only 21 SAEC-SW classifiers in the world and over half of classifiers lived in European countries. In terms of the development of disability swimming and swimming classification, it is a disadvantage for Asian, Middle and South American, and African countries because of a lack of medical and technical classifiers. In particular, there were no authorised classifiers in Africa. If African countries would like to host international swimming competition or classification seminars, they must invite several SAEC-SW classifiers from foreign countries such as in Europe, North America, and the South Pacific.

The main problem with the predomination of European classifiers in disability swimming is that they may control the development and change of classification systems and processes and decide who can become SAEC-SW classifiers just because they are the majority of the classifier group. This may be dangerous for the authority of SAEC-SW and social order in disability swimming if the majority (i.e., European classifiers) makes errors or only consider the rights of European swimmers. Fortunately, the SAEC-SW constructs a classification subcommittee to provide balance to such processes. Seven members form the subcommittee. Three members are European classifiers and the rest of the members are from different continents (A. Green, personal communication, 1997). Thus, most crucial issues need to be decided by the subcommittee but European classifiers cannot fully dominate this group.

Even if European classifiers dominate the classifier group, most classifiers are very fair so that they do not just concern themselves with swimmers who come from their own countries (J Buckley, personal communication, October, 1998). Thus, it seems that the predominance of classifiers from European countries may not produce a problem in terms of fairness of competition.

In addition, able-bodied classifiers apparently dominate the classification group. There are only two SAEC-SW classifiers who have physical impairments. Strohkendl (1991, 1996) noted that athletes should be empowered in active participation of classification. Craven (1990) stressed that retired athletes who have a lot of sport experience knowledge should have opportunities to become classifiers. If this concept is expected to apply in disability swimming, it seems that more retired swimmers with impairments need to participate in the classification training programme and then authorised as they show their classification knowledge and practices. It may not be easy for classifiers with moderate or severe degrees of physical impairments to work in the swimming classification group for long hours. This is because SAEC-SW classifiers usually need to classify many swimmers in national or international competition and they may only take a short rest during the long period of classification. In addition, most places for classifiers to observe swimming competition are arranged in the middle of the spectator area. Classifiers with physical impairments may find it difficult to access the classification area for observation and so their role may not be realised completely.

It is assumed that the domination of able-bodied classifiers in disability swimming may not be significantly changed in the near future unless the classification system and process are changed or the classification places are modified for the access of wheelchair athletes. In addition, the work load of classifiers may need to be reduced. Thus, more classifiers with impairments, in particular retired athletes, may want to involve in disability swimming and help classification. Most importantly, they can contribute their previous experience as swimmers to the actual development and revision of the classification system and process and represent the athlete's and classifier's perspectives together. SAEC-SW may also need to consider this option and try to recruit more retired swimmers to be trained as classifiers.

Table 5.10 Resources Used by SAEC-SW Classifiers to Learn Classification

	Group		
Resource	Medical classifier (n=12)	Technical classifier (n=6)	Total (%) (n=18)
Go to swimming competition			
Yes	11	5	16 (88.9%)
No	1	1	2 (11.1%)
Attend swimming classification seminars or workshops			
Yes	11	5	16 (88.9%)
No	1	1	2 (11.1%)
Read the classification manual			
Yes	10	6	16 (88.9%)
No	2	0	2 (11.1%)
Discuss with other classifiers			
Yes	10	6	16 (88.9%)
No	2	0	2 (11.1%)
Learn from swimmers			
Yes	6	3	9 (50.0%)
No	6	3	9 (50.0%)
Learn from coaches			
Yes	6	2	8 (44.4%)
No	6	4	10 (55.6%)

5.4 Conclusion

Principally, social order in current disability swimming and classification which can be maintained needs to achieve two conditions. First, an appropriate classification policy needs to be developed. SAEC-SW needs to use its authority to make the classification system and the classification process clearly and educate the competent and professional examiners to conduct proper and consistent classification. Second, SAEC-SW classifiers need to make a good use of resources, such as expert knowledge, professional knowledge and experience in the classification process so that they have the power to control the classification process properly. This study has specifically examined some of the more evident features of the role of classifiers as an agent of social control in disability swimming. A summary table is given to list seven important features of SAEC-SW medical and technical classifiers (see Table 5.11). This can be an useful information for people who would like to be trained as authorised classifiers.

Currently, SAEC-SW classifiers conduct classifications and evaluations professionally. The characteristic features of SAEC-SW classifiers are similar to the Parson's "trait theory" which standardized professions (Jones, 1994; Parsons, 1964). This trait theory comprised six important features of professions. First, the theory of knowledge is underlying and informing the practice of the profession. Second, the code of ethics is regulating practices. Third, the entry to the profession is well controlled through tests, training and through disciplinary powers. Fourth, professional authority is over the layman, based on specialist knowledge. Fifth, clients' information is treated confidentially. Six, the professional culture exists so that an agreed way of behaviors of social actors may be designed. It is recognised that classifiers use their specific knowledge in classification practices and control the classification process. They are well-trained by SAEC-SW and their role cannot be replaced by layman. Also they need to treat classification issues and swimmers' data as confidential. In addition, after the long discussion of Chapters 4 and 5 in SAEC-SW classifiers, their role in the disability swimming social system can be clearly identified and it is summarised in Table 5.12.

It is apparent that SAEC-SW has developed an appropriate training programme to educate people who want to become SAEC-SW classifiers (SAEC-SW, 1998). However, the criteria for learners or trainees to become authorised classifiers are quite strict so that currently only a few people can meet the standards in the world. In particular, technical classifiers are urgently needed in international competition. Despite the scarce number of classifiers, I find they play their roles well and control the classification process smoothly. Thus, the evidence of this study suggests that social order in disability swimming seems to be maintained successfully and classification practices among social actors are consolidated. It is believed that most swimmers do not need to worry unduly about any unfairness of competition (Riding, 1994).

Although disability swimming is developing quite successfully, SAEC-SW still needs to seriously address several issues related to classifiers. First, SAEC-SW needs to monitor the power of classifiers carefully to prevent them from abusing their power and authority. Second, it may be necessary for SAEC-SW to provide more educational opportunities in classification for developing countries. Currently, a lot of developing countries need classifiers or trainees to help classification. If developing countries have well-trained classifiers or trainees, it is expected to help the world-wide development of disability swimming. However, I do not think that the criteria for qualifications of classifiers should be adjusted to become easier. If this were the case, the authority of SAEC-SW and social order in disability swimming may be significantly affected and not fulfill its proper role. After all, the quality of classifiers is more important than the quantity of classifiers.

This study has identified the features of SAEC-SW classifiers. In particular, several concepts were clarified, such as resources used by classifiers to develop their role in classification, the socialization process of classifiers, and patterns of domination in disability swimming. The research methods and concepts used in this study may be very useful for wider applications. Further empirical work might need to be done to examine the role of classifiers in other disability sports. I believe that the role of classifiers is likely to have similar general features but will differ with respect to its particular instantiation and sport-specific needs.

Table 5.11 Summary Table of Important Features of SAEC-SW Classifiers

	Medical classifier	Technical classifier
• Speak English	Very Important	Very Important
• Qualification in Educational Background	Medicine or Physiotherapy	PE or Coaching
• Qualification in Swimming	Helpful to have a coaching or teaching certificate	Important to have a coaching or teaching certificate
• Practical Experience in Classification	Very Important	Very Important
• Experience in Swimming	Important	Very Important
• Medical Knowledge	Very Important	Important
• Swimming Knowledge	Important	Very Important

Table 5.12 Role of Classifiers in Disability Swimming

Classifier: Professional Role in Disability Swimming Classification
1. Must be fair and remain detached, not impose own values.
2. Must not act in self interest (for example, own country, money and career) but in interests of all swimmers with physical disabilities; must obey the code of conduct of classifiers.
3. Must apply a high degree of knowledge and skill to classify the swimmer.
4. Given right to evaluate swimmers intimately, decide classes and exercise professional authority; granted wide autonomy in classification practices.

(modified from Jones, 1994, p. 403)

CHAPTER 6

ANALYSIS OF SWIMMING CLASSIFICATION OUTCOMES

6.1 Introduction

In the previous studies (Chapters 4 and 5), the swimming classification process and the features of swimming classifiers were identified and discussed. However, if the swimming classification system has not been monitored to prove its effectiveness, fairness of the system is sometimes viewed as suspicious by swimmers, coaches, sport administrators, researchers and even the public. Thus, a fair and sport-specific classification system used in swimming competition needs to be examined and monitored by empirical studies.

A functional classification system has been used in international swimming competitions since 1989 (Green, 1991). In a functional system, swimmers with different physical impairments are integrated so that they compete together. The new edition of the classification system has received a mixed reception from practitioners and commentators. Green (1991, 1993), Hainey (1994), and Riding (1994) have presented positive comments to support the new system. Others, however, are suspicious and have challenged the fairness of the system (Richter, 1994; Richter, Adams-Mushett, Ferrara, & McCann, 1992; Sherrill, 1993). Both positions have presented well reasoned and persuasive arguments, but there has been no empirical research. This chapter is an attempt to rectify that deficiency. It focuses on the validity and, therefore, the credibility of the functional classification system.

The fairness of any classification system and swimming competitions, in particular, hinges on the relationship between swimming performances and impairments. Theoretically, a swimming classification system is fair if three conditions obtain. First, swimming performances across classes should be different, with swimmers in higher classes outperforming those in lower classes. Second, elite swimmers in the same class should demonstrate similar performances. Third, elite swimmers with different types of physical impairment should have equal opportunities to advance to the finals and win medals at the Paralympic Games, World Championships, or comparable international competition. The classification system, then, attempts to ameliorate the effects of impairment on competition. The aim of this study was to determine whether these conditions were manifested at the 1996 Paralympic Games.

6.2 Background

As discussed in Chapter 2, there are few research studies focused on swimming classification (Chatard et al., 1992; Gehlsen & Karpuk, 1992; Green, 1991; Hainey, 1994; Richter et al., 1992; Williamson, 1997). Indeed, for the most part, it has been limited to examinations of the 1992 Paralympic Games swimming competition by Chappel (1994), Green (1993), and Richter (1994). These researchers agreed that swimmers with dysmelia or amputations dominated swimming events when the functional classification system was used at the Barcelona Games and concluded that the system was unfair to swimmers with other types of physical impairments. The arguments of Richter et al (1992) against the functional classification system are that point system; rationale to integrate different impairments to compete together: sport technical, physiological, statistical, and variation problems; classifiers; and a lack of research to support the functional classification before it has been implemented.

Since these studies were published, however, there have been a number of changes in the practical application of the 1994 functional classification system in swimming. This highlights a major problem for classification research. The observations and self-reflection that goes on among classifiers means that no sooner has one competition ended than another version of the classification system is being articulated and developed for implementation at the next major championships. Consequently, there have been several versions of the functional classification system used in swimming since it was first introduced. For example, the point system was refined; disability profiles were rearranged; bench test items were adjusted; water tests and movement analyses were given emphasis in the classification process; and practical profiles in each class were added to the revised system (International Paralympic Committee, 1995; SAEC-SW, 1997a). Generally speaking, these changes affected swimmers with amputations and dysmelia very little. However, most swimmers with spinal cord injuries (SCI) or comparable impairments have been placed one class lower in freestyle, backstroke, and butterfly events (i.e., S class) using the revised classification system. In addition, classes for swimmers with cerebral palsy (CP) were rearranged. There are many changes for S classes but a few changes for breaststroke (SB) classes (International Paralympic Committee, 1995; SAEC-SW, 1997a). It is, therefore, extremely difficult for researchers to compare the data from one competition to another. The result is that, while the arguments of Richter et al (1992) are persuasive, they have never been subject to systematic empirical research and have never been influential in the transformation of the classification system.

The main purpose of research studies that have focused on an analysis of classification outcomes has been to determine the effectiveness of classification systems. Researchers have adopted a sports science approach using perspectives mainly from exercise physiology, biomechanics, and performance (e.g., Brasile, 1986, 1990; Coutts & Schutz, 1988; Gehlsen & Karpuk, 1992; Higgs et al., 1990). Most of these studies have tried to use quantitative data and statistical analyses to make recommendations to a sport's classification committee that they should combine some adjacent classes with similar physiological or functional abilities and athletic performances. The goal has been to reduce the number of classes and, at the same time, allow an evaluation of the fairness and effectiveness of a classification system (Higgs et al., 1990; Vanlandewijck et al., 1994, 1995). Most of these studies, however, were limited to an examination of the old International Stoke Mandeville Wheelchair Sport Federation (ISMWSF) classification system or other impairment-specific classification systems; to data on participants with spinal cord injuries; and to samples with very few participants with severe impairments. International swimming performance outcomes have received only brief mention in a few empirical studies (e.g., Chappel, 1994; Hainey, 1994). Gehlsen and Karpuk (1992) treated the topic much more thoroughly and in greater detail but their analysis was on the National Wheelchair Athletic Association (NWAA) swimming classification system in the United States and not the international functional classification system. They analysed 1256 data of national swimmers in freestyle, butterfly, and backstroke events to examine the relationship between swimming performances and classes in order to determine the effectiveness of the NWAA classification system. Their study, however, is a good methodological exemplar for future work to monitor other classification systems or the current swimming functional classification system.

6.3 Method

6.3.1 Participants

In this study, participants were 374 individuals (243 males and 131 females) from 50 countries at the 1996 Paralympic Games in Atlanta, Georgia. They swam in the 115 individual events and produced 890 individual swimming performances (472 for males and 418 for females) in the final events. There were a total of 345 individual medals (180 for males and 165 for females) and 115 gold medals (60 for males and 55 for females) awarded. However, there were 29 disqualifications (17 in male and 12 in female performances) in the 890 individual swimming performances.

6.3.2 Retrieval of Records

Two sources of data were used in this study. The first source was the swimmers' personal data (e.g., name, gender, age), classes (e.g., S, SB and SM), swimming times in individual finals at all strokes and distances, and medalist data were collected from the swimming results of the Atlanta Paralympic Organizing Committee (APOC) for classifiers, reporters, and team managers. The S classes were used in freestyle, backstroke, and butterfly events. The SB and SM classes were used in breaststroke and medley events, respectively. Strokes and swimming distances in male and female events included 50 meters freestyle, 100 meters freestyle, 200/400 meters freestyle, 50/100 meters backstroke, 50/100 meters butterfly, 50/100 meters breaststroke, and 150/200 meters individual medley. All swimming data collected and analysed did not include swimmers with visual impairments and mental disabilities.

The second source was the diagnoses and physical impairments of swimmers identified by the International Paralympic Committee Sports Assembly Executive Committee for Swimming (SAEC-SW). According to the diagnosis of swimmers on their classification sheets, 374 swimmers (243 males and 131 females) were further categorised in one of six types of physical impairments: poliomyelitis, spinal cord injury (including spina bifida), cerebral palsy, amputation, dysmelia and les autres. The number of each physical impairment category is shown in Table 6.1.

Generally, swimmers' impairments and detailed diagnoses at the classification sheets were written down by SAEC-SW classifiers in the classification process. Because this information was necessary and important for classifiers to combine with the results of bench tests and water tests to then decide the classes of swimmers, checking SAEC-SW classification sheets were the most appropriate way to know swimmers' impairments in this study.

Table 6.1 Types of Physical Impairments of Swimmers Participated in the 1996 Paralympic Games

	CP	SCI	Polio	Amputee	Dysmelia	Les autres
Male (n =243)	43	33	23	55	62	27
Female (n =131)	26	19	10	26	24	26
Total (n =374)	69	52	33	81	86	53

Note. CP: cerebral palsy; SCI: spinal cord injury; Polio: poliomyelitis.

6.3.3 Procedure

During 9 days of the 1996 Paralympic swimming competition, two SAEC-SW classifiers helped the researcher to write down all swimmers' impairments and diagnoses. Data of impairments of 368 swimmers were obtained from SAEC-SW classification files. Six swimmers' classification sheets were unavailable at that time; the researcher obtained these data from the SAEC-SW chairperson in October, 1996.

Swimming data (i.e., swimmers' name, swimming times, swimming distances, and swimming events) were collected from the APOC publication office after every competition day. In this study, swimming performance was defined as swimming speed. From the swimming times and distances published by APOC, swimming speeds were calculated as swimming distance divided by swimming times. The swimming time was the total time that included all starts, strokes, and turns. This standardizes the value of swimmer's speed for analysis and comparison. If swimmers did not finish the races or were disqualified, these swimming speeds did not calculate. However, their impairments were still counted as advancing to the final.

6.3.4 Analysis of Data

The Statistical Package for the Social Sciences (SPSS for Windows, Release 7.0) was used to analyse the data. Descriptive statistics were used to determine the mean speeds of finalists and the frequency distributions of impairments among male, female, and total swimmers. In order to examine Condition 1, a one-way analysis of variance (ANOVA) was used to determine differences of swimming performances in separate male and female stroke events and distances. If significant F-ratios were found, a Scheffe post hoc test was applied in order to identify were the differences lay. To examine Condition 2, Spearman rank correlation coefficient was used to identify associations between classes and swimming speeds in male and female events, and standard deviation in each male and female event was noted. To examine Condition 3, a chi-square test was conducted to analyse differences of impairments among participants, gold medal winners, medalists, and finalists in male, female, and total swimming events, and a separate chi-square test was used to analyse the differences in impairment groups between participants and gold medalists, between participants and medalists, and between participants and finalists in male, female, and total events. An alpha level of .05 was accepted as being statistically significant in this study.

6.4 Results

6.4.1 Relationships between Swimming Performances and Classes

The mean speed of the finalists in each event of the S classes is shown in Table 6.2. The pattern of speeds for both males and females across classes in the freestyle and backstroke events was consistently similar in that the higher the S class, the faster the swimming speeds. In the events of freestyle and backstroke, there were significant differences in swimming speeds across classes ($p < .001$). For both males and females, there were significant differences in swimming speeds in 32 out of 61 (52%) of adjacent classes, except between classes S7 and S8, and between classes S9 and S10. With regard to the differences of performances between the next higher and the next lower classes relative to the swimmers in the freestyle and backstroke events, there were significant differences in 47 out of 53 (89%) of these pairs of classes (see Table 6.2).

In the butterfly events, the overall pattern between classes and swimming speeds was slightly different from the freestyle and backstroke events. For example, the mean speeds of both male and female swimmers in S8 classes were slower than those of swimmers in S7 classes ($p > .05$). Although there were significant differences in swimming speeds across classes in butterfly events ($p < .001$), there were significant difference of performances in 3 out of 14 (22%) of adjacent classes and in 6 out of 12 (50%) of the higher and lower adjacent classes.

The mean speed of SB finalists is shown in Table 6.3. The general pattern in the breaststroke events was similar that the higher the class, the faster the speed, except the mean speed of SB3 female swimmers was faster than that of the SB4 swimmers, and the mean speeds of SB9 and SB10 in the same gender were similar. There were significant differences of swimming speeds across SB classes ($p < .001$). However, there were no significant differences in swimming speeds between adjacent classes SB3 and SB4, classes SB5 and SB6, classes SB6 and SB7, and classes SB9 and SB10, and there were no significant differences across the higher and lower adjacent classes such as SB5 and SB7.

In the individual medley (SM) events, swimming speeds are shown in Table 6.4. A clear pattern between performance and class was that the higher the class, the faster the speeds. There were significant differences in swimming speeds across SM classes ($p < .001$), and there were significant differences in 100% across the higher and lower adjacent classes ($p < .05$). However, there were no significant differences between adjacent classes SM4 and SM5, classes SM7 and SM8, and classes SM9 and SM10.

The Spearman rank correlations between functional class and swimming speeds are shown in Table 6.5. The Spearman rho ranges from .92 ($p < .001$) to .99 ($p < .001$) in male events and from .86 ($p < .001$) to .96 ($p < .001$) in female events. These results showed high positive correlations between classes and swimming speeds for all strokes in male and female events. The lowest Spearman rank correlation coefficients in male and female both appeared in the butterfly events, and the highest Spearman rho values were in 50 and 100 meters freestyle events.

Standard deviations of swimming speeds in most events were less than 0.10 (see Tables 6.2, 6.3 and 6.4). However, female swimmers in classes S3, S4, and S5 were over 0.10 (see Table 6.2).

6.4.2 Relationships between Performances and Impairments

The distributions of types of impairments and medals for the 1996 Paralympic competition are given in Figures 6.1, 6.2 and 6.3. Among male swimmers (see Figure 6.1), there was no single type of impairment that dominated the Games in terms of the opportunities for participation, winning gold medals or medals, and advancing to the finals, $\chi^2(15, N = 955) = 10.57$, $p > .05$. The only exceptions were, perhaps, that males with SCI had a slightly better chance, and males with poliomyelitis had a worse chance, of winning a gold medal. The percentage of gold medals (20.0%) won by males with SCI compared favourably to their distribution (13.6%) among swimming competitors, while the percentage of gold medals won by male swimmers with poliomyelitis (1.7%) compared unfavourably to their distribution. In neither case, though, were they disadvantaged when it came to winning a medal other than gold. Similarly, swimmers with cerebral palsy were not disadvantaged and swimmers with amputations or dysmelia did not have any advantage with regard to their participation and opportunity to win medals of any colour, $\chi^2(5, N = 423) = 1.24$, $p > .05$.

Among female swimmers, the distribution of impairments was different to that of males (see Figure 6.2) and as a result there were different patterns in the opportunity to participate and win medals. In terms of percentage distributions, for example, the numbers of female swimmers with dysmelia (18.3%) and amputations (19.9%) were less than the numbers of males with dysmelia (25.5%) and amputations (22.6%). Similarly, there were more females (19.9%) than males (11.1%) in the les autre class. These female swimmers in the les autres category, together with females in the cerebral palsy category, account for 40% of the 131 female swimmers but they had a better chance of winning a gold medal. They won 19 (34.5%) and 17 (30.9%), respectively, for a total of 55 gold medals. Conversely, female swimmers with poliomyelitis and dysmelia had less chance of winning a gold medal, $\chi^2(5, N = 186) = 11.22$, $p < .05$. However, there were no significant differences between swimmers' impairments with regard to their participation and the possibility of winning a medal, $\chi^2(5, N = 296) = 5.96$, $p > .05$, and their participation and advancing to the finals, $\chi^2(5, N = 549) = 0.70$, $p > .05$.

When the data for male and female swimmers were combined (see Figure 6.3), these patterns in the female data were still as pronounced with respect to winning gold medals, $\chi^2(5, N = 489) = 13.54$, $p < .05$. Swimmers with poliomyelitis and dysmelia have won less gold medals, and swimmers with CP and les autres have won more gold medals ($p < .05$). Overall, though, no single impairment group had any advantage or disadvantage with respect to advancing to the final, $\chi^2(5, N = 1264) = 5.33$, $p > .05$, and winning a medal, $\chi^2(5, N = 719) = 4.89$, $p > .05$.

Table 6.2 Mean Speeds (meters/sec) of Swimmers in the Individual S Class Events

	50m freestyle		100m freestyle		200/400m freestyle		50/100m backstroke		50/100m butterfly	
S class	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
S2	0.59 ± 0.07^{a,b} (n = 8)	0.51 ± 0.05^{a,b} (n = 8)	0.55 ± 0.06^{a,b} (n = 7)	0.47 ± 0.06^{a,b} (n = 6)			0.60 ± 0.07^{a,b} (n = 7)	0.50 ± 0.05^{a,b} (n = 7)		
S3	0.85 ± 0.07^{a,b} (n = 8)	0.65 ± 0.10^{a,b} (n = 8)	0.79 ± 0.05^{a,b} (n = 8)	0.61 ± 0.11^{a,b} (n = 8)	0.73 ± 0.08^{a,b} (n = 7)		0.81 ± 0.08^{a,b} (n = 8)	0.63 ± 0.12^{a,b} (n = 8)	0.61 ± 0.06^{a,b} (n = 4)	
S4	1.07 ± 0.07^{a,b} (n = 8)	0.91 ± 0.15^{a,b} (n = 7)	0.99 ± 0.06^{a,b} (n = 8)	0.84 ± 0.15^{a,b} (n = 8)	0.93 ± 0.07^{a,b} (n = 8)	0.86 ± 0.12^{a,b} (n = 6)	0.92 ± 0.06^{a,b} (n = 8)	0.79 ± 0.14^{b} (n = 6)	0.87 ± 0.11^{a,b} (n = 7)	
S5	1.24 ± 0.05^{a,b} (n = 8)	1.10 ± 0.11^{a,b} (n = 8)	1.13 ± 0.07^{a,b} (n = 8)	1.00 ± 0.13^{a,b} (n = 8)	1.04 ± 0.10^{a,b} (n = 8)	0.96 ± 0.11 (n = 7)	1.12 ± 0.10^{b} (n = 8)	0.86 ± 0.14 (n = 8)	1.10 ± 0.09^{a,b} (n = 8)	0.87 ± 0.17^{b} (n = 7)
S6	1.45 ± 0.11^{a,b} (n = 8)	1.24 ± 0.06 (n = 8)	1.33 ± 0.08^{a,b} (n = 8)	1.13 ± 0.06 (n = 8)	1.22 ± 0.06^{b} (n = 8)	1.05 ± 0.07 (n = 8)	1.18 ± 0.04 (n = 8)	0.95 ± 0.04^{b} (n = 8)	1.31 ± 0.10 (n = 8)	0.97 ± 0.03 (n = 7)
S7	1.58 ± 0.03^{b} (n = 8)	1.30 ± 0.06^{b} (n = 8)	1.45 ± 0.02^{b} (n = 8)	1.20 ± 0.03^{b} (n = 8)	1.27 ± 0.04^{b} (n = 8)	1.06 ± 0.05^{b} (n = 8)	1.21 ± 0.04^{b} (n = 8)	1.04 ± 0.06^{b} (n = 8)	1.42 ± 0.04 (n = 6)	1.12 ± 0.13 (n = 6)
S8	1.66 ± 0.04^{b} (n = 8)	1.38 ± 0.08^{a,b} (n = 8)	1.51 ± 0.04^{a,b} (n = 8)	1.24 ± 0.07^{a,b} (n = 8)	1.32 ± 0.06^{b} (n = 8)	1.12 ± 0.10^{b} (n = 5)	1.31 ± 0.07^{a,b} (n = 8)	1.07 ± 0.08^{a,b} (n = 7)	1.33 ± 0.10^{b} (n = 6)	1.09 ± 0.08^{b} (n = 5)
S9	1.76 ± 0.03 (n = 8)	1.55 ± 0.03 (n = 8)	1.61 ± 0.02 (n = 8)	1.43 ± 0.03 (n = 8)	1.41 ± 0.03 (n = 8)	1.25 ± 0.06 (n = 8)	1.42 ± 0.03 (n = 8)	1.25 ± 0.10 (n = 8)	1.46 ± 0.05 (n = 8)	1.25 ± 0.05 (n = 8)
S10	1.84 ± 0.03 (n = 8)	1.56 ± 0.08 (n = 8)	1.69 ± 0.04 (n = 8)	1.47 ± 0.06 (n = 8)	1.46 ± 0.03 (n = 8)	1.29 ± 0.08 (n = 8)	1.47 ± 0.05 (n = 8)	1.24 ± 0.07 (n = 8)	1.54 ± 0.04 (n = 7)	1.32 ± 0.10 (n = 6)

Note. Values are means ± standard deviations.

In the 200/400m freestyle events, S3-S6 swam 200m, and S7-S10 swam 400m. In the 50/100m backstroke events, S2-S5 swam 50m, and S6-S10 swam 100m. In the 50/100m butterfly events, S3-S7 swam 50m, and S8-S10 swam 100m.

[a]A significant Scheffe contrast between this class and the next higher class ($p < .05$). [b]A significant Scheffe contrast between this class and the next two higher class ($p < .05$).

Table 6.3 Mean Speeds (meters/sec) of Swimmers in the Individual SB Class Events

SB class	Male	Female
SB2	0.72 ± 0.05[a,b] (n = 8)	
SB3	0.84 ± 0.08[b] (n = 6)	0.76 ± 0.11 (n = 7)
SB4	0.88 ± 0.08[a,b] (n = 8)	0.74 ± 0.08 (n = 7)
SB5	0.99 ± 0.05 (n = 8)	0.78 ± 0.06 (n = 7)
SB6	1.03 ± 0.05[b] (n = 7)	0.83 ± 0.02[b] (n = 5)
SB7	1.07 ± 0.07[b] (n = 7)	0.85 ± 0.07[a,b] (n = 8)
SB8	1.17 ± 0.06 (n = 6)	0.99 ± 0.03[a,b] (n = 8)
SB9	1.24 ± 0.06 (n = 8)	1.09 ± 0.04 (n = 8)
SB10	1.24 ± 0.07 (n = 8)	1.10 ± 0.04 (n = 5)

Note. Values are means ± standard deviations.

Swimmers in SB2 and SB3 swam 50m, and swimmers in other classes swam 100m.

[a]A significant Scheffe contrast between this class and the next higher class ($p < .05$). [b]A significant Scheffe contrast between this class and the next two higher class ($p < .05$).

Table 6.4 Mean Speeds (meters/sec) of Swimmers in the Individual SM Class Events

SM class	Male	Female
SM3	0.65 ± 0.08[a,b] (n = 7)	
SM4	0.84 ± 0.07[b] (n = 8)	0.72 ± 0.10[b] (n = 7)
SM5	0.93 ± 0.09[a,b] (n = 6)	0.80 ± 0.09[b] (n = 7)
SM6	1.04 ± 0.04[a,b] (n = 7)	0.86 ± 0.06[b] (n = 8)
SM7	1.13 ± 0.02[b] (n = 8)	0.94 ± 0.05[b] (n = 8)
SM8	1.19 ± 0.04[b] (n = 6)	0.98 ± 0.07[a,b] (n = 7)
SM9	1.29 ± 0.03 (n = 8)	1.14 ± 0.02 (n = 8)
SM10	1.35 ± 0.05 (n = 8)	1.18 ± 0.08 (n = 8)

Note. Values are means ± standard deviations.

Swimmers in SM3 and SM4 swam 150m, and swimmers in other classes swam 200m.

[a]A significant Scheffe contrast between this class and the next higher class ($p < .05$). [b]A significant Scheffe contrast between this class and the next two higher class ($p < .05$).

Table 6.5 Spearman Rank Correlations between Classes and Swimming Performances

Events	Male	Female
50 m freestyle (S)	.99 *	.96 *
	(n = 72)	(n = 71)
100 m freestyle (S)	.99 *	.96 *
	(n = 71)	(n = 70)
200/400 m freestyle (S)	.96 *	.88 *
	(n = 63)	(n = 50)
50/100 m backstroke (S)	.96 *	.93 *
	(n = 71)	(n = 68)
50/100 m butterfly (S)	.92 *	.86 *
	(n = 54)	(n = 39)
50/100 m breaststroke	.93 *	.86 *
(SB)	(n = 66)	(n = 55)
150/200 m medley (SM)	.97 *	.90 *
	(n = 58)	(n = 53)

Note. * $p < .001$.

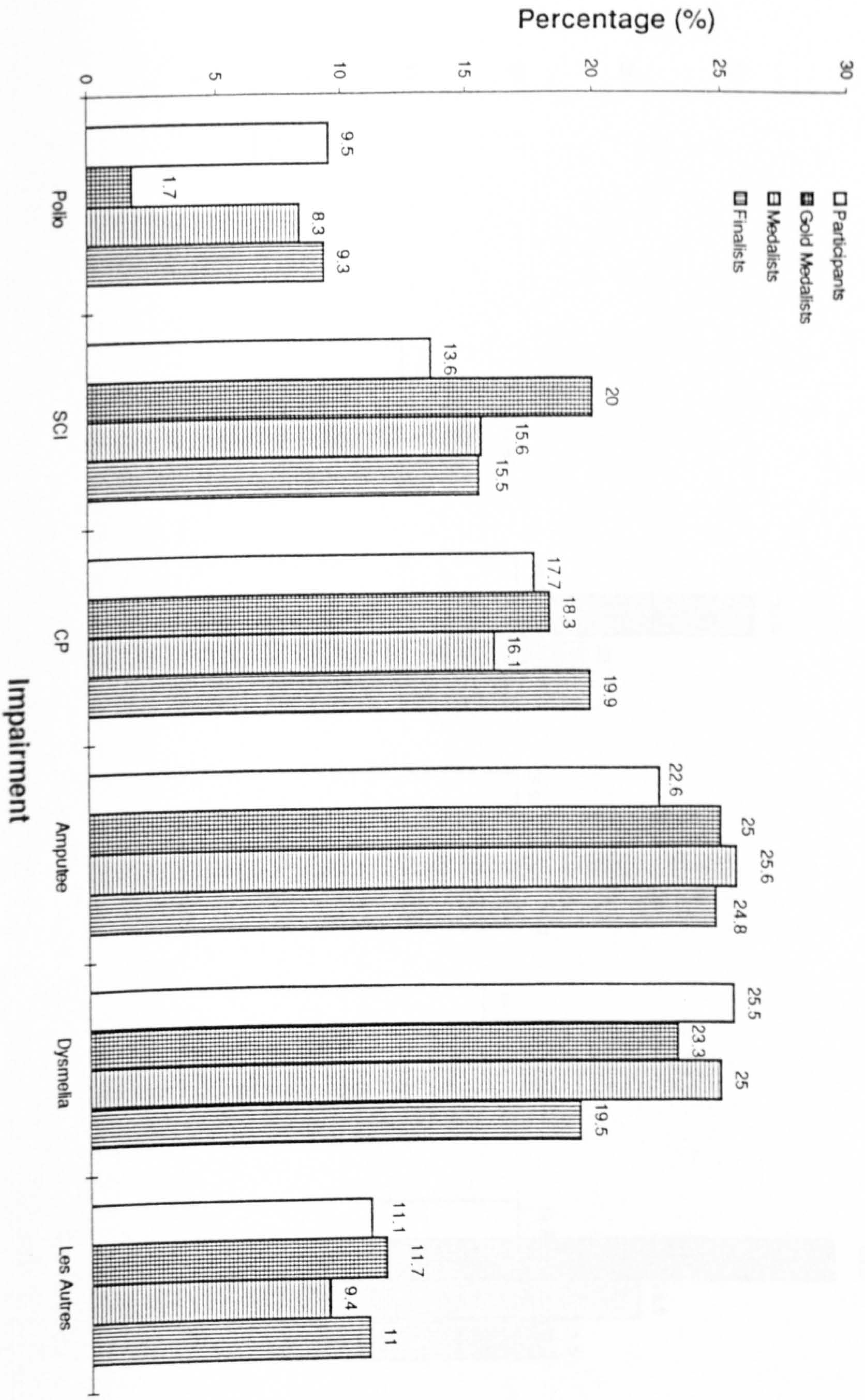
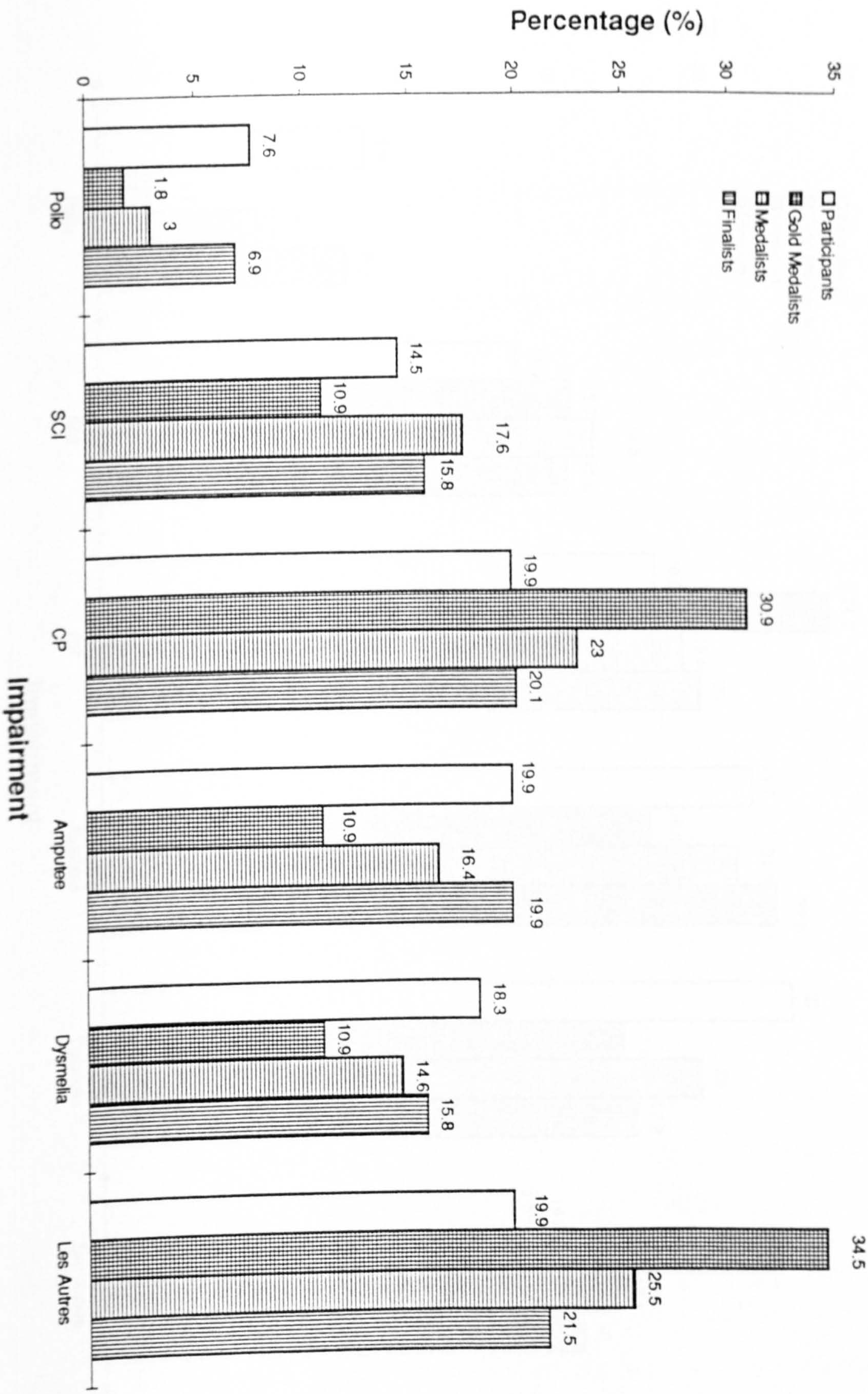


Figure 6.1 Percentage of impairments of male swimmers at the 1996 Paralympic Games

Figure 6.2 Percentage of impairments of female swimmers at the 1996 Paralympic Games



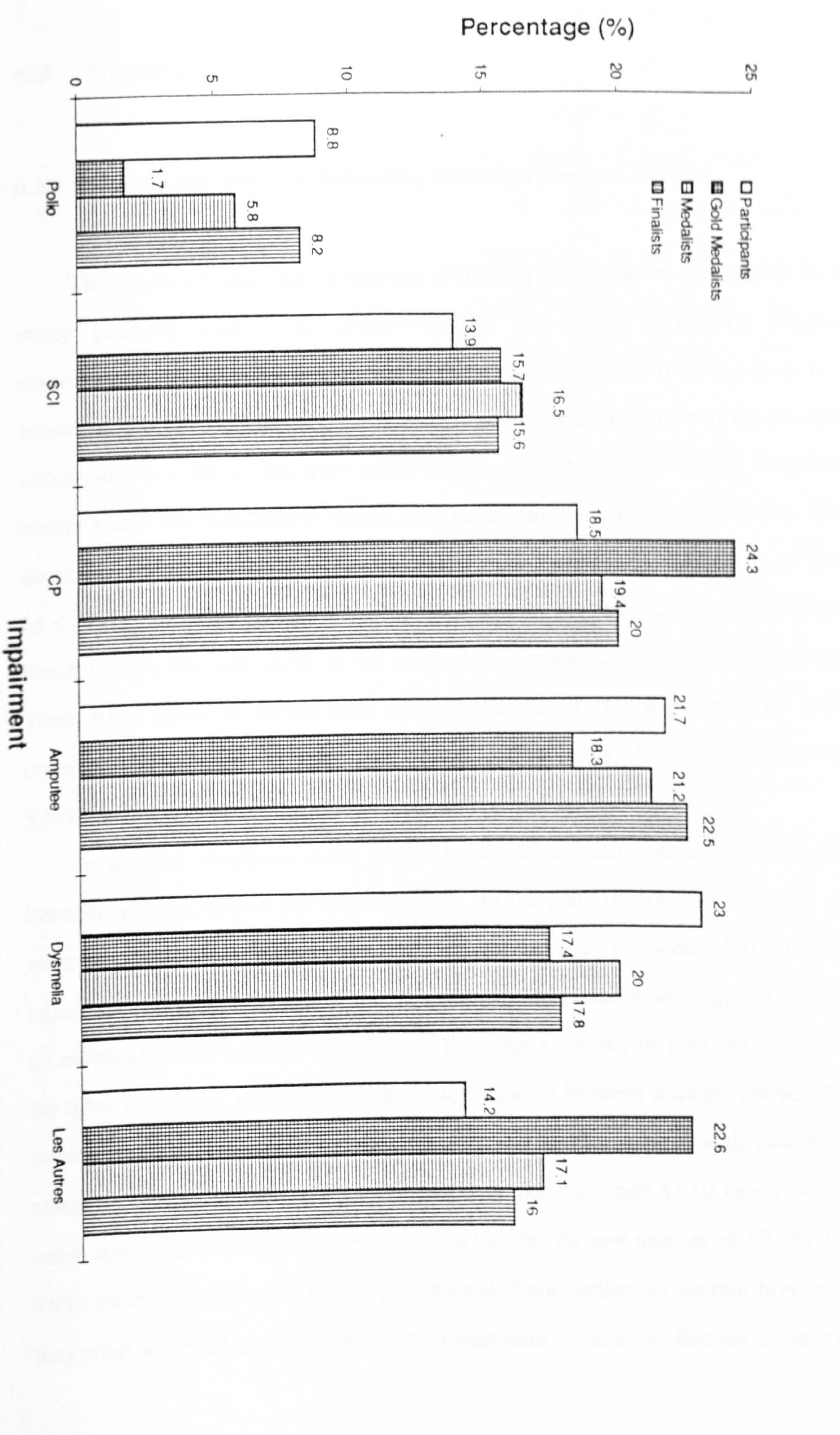


Figure 6.3 Percentage of impairments of total swimmers at the 1996 Paralympic Games

6.5 Discussion

6.5.1 Relationships between Swimming Performances and Classes

The results of relationships between swimming performances and classes in this study generally support the effectiveness of the current swimming functional classification system in the assumption of fair competition. The overall pattern in the relationship between swimming performances and classes indicated that the theoretical conditions for a fair system were present in the 1996 Paralympic Games competition except that a few breaststroke classes and some butterfly events did not fully match them. Swimming performances across classes were significantly different in all events ($p < .001$). Specifically, swimmers in higher classes generally outperformed those in lower classes and swimmers in the same class demonstrated similar performances. There were, however, several areas of divergence in the general patterns. We need to consider these patterns in some detail because they reveal those aspects on which SAEC-SW and its classifiers should focus their attention.

In an ideal condition, there should be significant differences of performances between adjacent classes and across classes. In the real competition, however, there were no significant differences of swimming performances in 58 out of 101 (57%) of adjacent classes and 13 out of 87 (17%) across the higher and lower adjacent classes in all events at the 1996 Paralympic Games. There are a number of possible explanations for these exceptions to the differences in performance between adjacent classes. First, there were fewer swimmers at classes S8, S10, and SB10 compared with swimmers at classes S7, S9, and SB9 so it may be that these S8, S10, and SB10 categories were much less competitive. In some events, for example, the low number of S8, S10, and SB10 swimmers meant that there were not enough competitors to warrant heats and so they often advanced directly to finals. It is reasonable, therefore, that the mean speeds of classes S8, S10, and SB10 may be slower than the predictive trend (see Tables 6.2 and 6.3).

Second, some swimmers were disqualified for illegal strokes and turns especially in the butterfly and breaststroke competitions. There were 12 disqualifications (6 males and 6 females) in butterfly and 7 disqualifications (5 males and 2 females) in breaststroke events. This situation may have affected the results. For example, there were 30 swimmers in classes S7 and S8 butterfly finals but 7 of them (23%) were disqualified and this may have distorted the pattern in the relationship between classes and performance in butterfly events.

Third, swimmers at some adjacent classes may swim different distances in backstroke, butterfly, breaststroke, and individual medley. For example, S7 swimmers swam 50 meters in butterfly events but S8 swimmers swam 100 meters, and SB3 swimmers swam 50 meters in breaststroke events but SB4 swimmers swam 100 meters. Thus, S7 swimmers' speeds may be faster than S8 swimmers and SB3 swimmers' mean speed may be faster than SB4 swimmers when all classes of swimmers in butterfly and breaststroke events were analysed and compared.

Fourth, it could be that the current swimming classification system has some problems with the criteria for classes SB5 and SB6 and so the swimming speeds between several adjacent SB classes may not show significant differences. If we checked the classification manual carefully, trunk functions may not be identified clearly in these three classes (International Paralympic Committee, 1995). In this situation, how can a swimmer be classified to an appropriate SB class? If the class may not be right, the relationship between these classes and swimming performance will be affected (see Table 6.3).

Fifth, the swimming classification system and the process of classification may have other problems that the performance approach may not reveal. Although there are some differences in S and SB classification processes and classification system, the detailed contents and rationales of the classification system, and problems in the actual classification process cannot be identified in the study of performance outcomes. However, these factors may affect the classification outcomes tremendously (Richter et al., 1992).

Not only does classification affect swimming performances, but also other important factors such as coaching, training, swimmers' techniques, and physical characteristics of swimmers affect performances (DePauw, 1986). These factors, however, cannot be revealed in this study. Thus, there is a need to analyse classification outcomes from different perspectives such as physiology and biomechanics in order to identify these factors in greater detail.

The idea of misclassification is an interesting and perennial problem in disability sport. As with many other sports, it is the root cause of much frustration and anger among swimmers who are disadvantaged when losing to a competitor who they think should be in a higher class and among coaches and their swimmers who may believe that they have been disadvantaged by being placed in a higher class than their impairment warrants. At the 1996 Paralympic Games there were six classification appeals and protests in the swimming competition, and at its conclusion only three out of a total of 374 Paralympic swimmers would appear to have been misclassified, and they needed to be reviewed in the future swimming competition (A. Green, personal communication, October, 1996). The problem is nearly always situated at the borders of adjacent classes and there are two sources of difficulty. Firstly, for various reasons a swimmer may not exhibit their real abilities during the bench test and water function assessment or a classifier makes an error and as a result the swimmers is placed in a lower or higher class. On the other hand, a classifier may make incorrect observations or make an error in the application of the classification criteria and allocate a swimmer to a higher class. Usually, there is no evidence to show whether either of these is the source of the misclassification but on appeal it is assumed to be an error by classifiers. The Classification Committee of the SAEC-SW has the authority to order a re-classification of a swimmer when there is incongruence between his or her functional class and performance. This topic needs to be investigated thoroughly; to this point in time the reliability of SAEC-SW classifiers has never been subjected to systematic empirical scrutiny (Davis, 1994).

Since the introduction of a functional classification system in Paralympic swimming events the standard of competition has improved and the credibility of the Games has increased (Hainey, 1994). These goals were advocated by Green (1991) and Hainey (1994) and their achievement is well recognised by spectators, swimmers, coaches, and researchers. Not only has the number of classes been reduced from 31 to 10, but there has been a reduction in the cancellation of events and the number of races in which swimmer from several classes take part (Hainey, 1994). Combining classes was necessary in the past to avoid having races in which only two or three swimmers competed. Event cancellations do still occur, especially in lower classes and a few female events have been canceled because of no swimmers in a class or too few swimmers in an event, but the number has reduced. According to the SAEC-SW rules, there should be 140 individual events (10 classes × 2 sexes × 7 swimming distances and strokes) at the Paralympic Games. In fact, 115 valid events (82%) were held at the 1996 Paralympic Games. This result was even better than the 106 swimming events held (76%) at the 1992 Paralympic Games (Hainey, 1994).

We must recognise that performances between adjacent classes may still overlap (Williamson, 1997) and so the performances of a few swimmers in lower classes may be better than those of swimmers in higher classes. From this point of view, the significant differences in performances between adjacent classes are not the most important if the pattern between classes and performances is acceptable.

According to the swimming classification manual, a swimmer's individual medley class is determined by the following equation (International Paralympic Committee, 1995).

$$SM = \frac{(3 \times S) + (1 \times SB)}{4}$$

In the empirical data the relationship between SM classes and swimming performances generally supported the theoretical condition of a fair competition. That is, the higher the SM classes, the faster the speeds. I may state that the SM equation generally works in Paralympic medley events. However, there were no significant differences in swimming speeds between adjacent classes SM4 and SM5, classes SM7 and SM8, and classes SM9 and SM10. The reasons for these results were similar to the factors discussed for S and SB events above. For example, (a) there were fewer swimmers in SM10 and so the SM10 speed may not swim significantly faster than SM9; (b) there were 6 disqualifications in individual medley finals and 3 disqualifications in the SM8 event (19%), and this may affect the result between classes SM7 and SM8; (c) swimmers swam 150 meters in SM4 but SM5 swimmers swam 200 meters, and so the mean speed of SM5 swimmers may not be significantly faster than that of SM4 swimmers; (d) swimmers' S or SB classes were not be classified right and as a result their SM classes may be affected; (e) there were a few problems in swimming classification system and so SM class may be more or less affected; and (f) coaching or training factors affected the swimmers but these cannot be revealed in this study.

One of the purposes of evaluating performance outcomes is to combine similar classes and so reduce the number of winners in order to enhance the strength of competition and maintain the fairness of competition (Higgs et al., 1990). In addition, it is easier for sports administrators to arrange competition programmes and manage games (Hainey, 1994; Vanlandewijck & Chappel, 1996; Vanlandewijck et al., 1995). If this objective is desirable, then on the basis of our results one could argue that some classes need to be combined; this is especially true for classes S7 and S8, classes S9 and S10, and classes SB9 and SB10. If this were to occur then the number of S and SB classes would be reduced by two and one, respectively. However, for the argument to be effective in practice there would have to be another, major version of the functional classification system. Not only would this entail the development of the theoretical rationale and some consensus in its operationalisation, but a lot of swimmers would have to be reclassified and many new controversial issues would be raised. For example, are we sure that the relationships between performances and classes at the next World Championships or Paralympic Games match our expectations using the results to combine classes? If not, the combination of classes may prompt some swimmers to drop out or retire immediately because they may feel unfairly penalised by the system. As a result, the credibility of SAEC-SW and the classification system will be questioned. Thus, I believe that it needs careful consideration and more research to deal with the issue of combination of classes.

The high positive Spearman correlation coefficients between classes and swimming speeds in male and female events support the theoretical principles of the classification system that the swimmers in a class have similar performances, and that the higher the class, the faster the swimming speeds. One of the major difficulties facing the development of any classification system, however, is how to deal with the assumption that all individuals in the same category demonstrate a similar performance standard. Decreasing the number of classes in a system has the effect of increasing the number of swimmers in each class. This is desirable when the goal is to increase the credibility of the whole swimming competition, but it is extremely problematic in single events because it increases the potential for differences between swimmers. This is already a problem in the current system and it was evident in several events in Atlanta. Generally speaking, the speeds of female finalists had greater diversities especially in the events of classes S3, S4, and S5. The values of standard deviation in these events were over 0.10 (see Table 6.2) and this was indicative of large variations in swimming speeds among finalists in some events. One important factor to explain it was the small number of female swimmers in these classes and so they advanced directly to the finals. As a result, not all finalists swam similarly. In addition, this result may be relevant also to coaching and swimmers' techniques. Future studies need to monitor performances in these female classes in greater detail.

In addition, there was one result that went beyond our expectations. The mean speed of S4 female swimmers in the 200 meters freestyle final was faster than that of that of S4 female swimmers in 100 meters freestyle, but there were high standard deviations in both S4 events. Theoretically, elite swimmers should swim faster over a shorter distance than those who swim a longer distance. I defined swimmers who advanced to finals as elite swimmers and used their data to examine the relationship between classes and performances. In this case, however, the non-medalists in the 100 meters swam much slower and their speeds brought the mean speeds down below that of the 200 meters event. Indeed, if I just analysed swimming speeds of the S4 medalists, those who swam the 100 meters freestyle were significantly faster than those who swam at the 200 meters freestyle. It may indicate that finalists in this class have had large diversity and the training factor may be an important factor to explain this unexpected result.

6.5.2 Relationships between Performances and Impairments

The relationship between performances and impairments lies at the heart of swimming classification schemes (Richter et al., 1992). A swimming classification systems is considered fair if the distributions of winning medals and advancing finals of among impairment groups follow the similar distributions of impairment groups among the Paralympic swimming competitors. As their relationship is examined, however, I should point out that the discussion is exploratory. Not only is this relationship of relatively recent concern to researchers of swimming classification, but the issues identified in the analysis suggest there are more complexities to be considered than we have been able to cover here.

In general, the distributions between performances and impairments were similar to the theoretical condition: elite swimmers should have equal opportunities to advance the finals and win medals. However, one detail that I noted was that the patterns of impairments are different for males and females. For example, female swimmers with CP and les autres won more gold medals (65.4%) compared with their participation (39.8%). With regard to this result, I cannot conclude that the current classification system gave any benefit to any impairment groups specifically to CP and les autres groups because male swimmers did not show the similar pattern. One reason to explain this was there were 13 super stars (4 males and 9 females) who each won over 3 gold medals in the Paralympic swimming individual events. They won 40% of total 115 gold medals in their own specific classes, and the 9 females swimmers won 31 out of 55 gold medals (56%). Their excellent performances in some specific impairment groups obviously distorted the winning patterns. Therefore, it may be more important to examine the distributions of impairment groups between participants and medalists, and between participants and finalists instead of only analysing the link between participants and gold medalists. Then I can use these patterns to identify whether is any specific impairment group dominated the Paralympic Games.

Another similar pattern in male and female events was that swimmers with poliomyelitis won less gold medals than other impairment groups. Several questions may be raised about this result. Were swimmers with poliomyelitis disadvantaged in the current classification system or were other factors involved? For example, most swimmers with poliomyelitis were from developing countries. Did the geographic factor affect performances and then affect the relationship between performances and impairments? Another suspicions may be that swimmers with poliomyelitis have normal sensations in their limbs although some of limbs lose motor functions. When they swim, they may feel leg sway, leg drag, or body position but they may not be able to control it. In this situation normal sensation without good motor control may affect their performances (Weiss & Curtis, 1986). However, this issue needs to be examined in more detail.

Regarding distributions between performances and impairments in the total swimmers of the 1996 Paralympic Games, these patterns are different to those of previous Games. As far as comparisons are feasible with the 1992 Paralympic swimming competition in Barcelona, Chappel (1994) noted that swimmers with CP and SCI (including spina bifida and poliomyelitis) were underrepresented in the medal tables. They accounted for 19.6% and 30.65%, respectively, of the impairments among swimmers during competition but only 8.91% of swimmers in the CP and 10.89% in the SCI categories won gold medals. On the other hand, swimmers with amputations, dysmelia, and les autres conditions, dominated the competition for winning many medals and gold medals. Surprisingly, swimmers in these latter categories won 80% of all gold medals. As for the opportunity to advance to the finals, there was no information from the 1992 Paralympic Games in Chappel's (1994) article that could be used as a comparison with the 1996 competition. Unfortunately, he did not present and discuss the number of swimmers in detail and did not make any distinction between male and female data. I would suggest, therefore, that the level of detail presented using the 1996 results should continue to be used to allow for future comparisons.

Generally speaking, though, the dominance of specific impairment groups appears to have been changed from the 1992 and 1996 Games. During that time the revised classification system seems to have become more effective in maintaining fair competition in terms of impairment groups. In particular, water tests to evaluate stroke functioning and other factors have given greater weight in the swimming classification process, especially with respect to the effects of drag by legs and trunk among swimmers with SCI and comparable impairments, and incoordination among swimmers with CP (International Paralympic Committee, 1995). These have been discussed, observed, and reflected upon more frequently and to greater effect by the SAEC-SW classifiers (Green, 1993). From the empirical data of this study, therefore, it seems that the great majority of swimmers in all categories have equal opportunities to participate in the Games, advance to the finals, and win medals. However, just as categories in the classification system create problems, so do they present the researcher with difficulties when analysing data for trends.

Categorization is problematic because by reducing, in this case, 374 individual impairments to six there is an obvious danger that the detail is lost. The category in which this is most likely to occur is that of les autres. This category included impairments such as dwarfism, arthrogryposis, multiple sclerosis, muscular dystrophy, brachial plexus injury, Guillain Barre syndrome, stiff joint, osteogenesis imperfecta, neuropathy, connective tissue problem, Perthes disease, and osteoarthritis. Such diversity, especially in its effects on swimming performance, is lost in the reduction to a single category. The distribution of these impairments, however, demonstrates such small numbers that it does not appear to warrant an expansion of les autres and a subsequent increase in the number of viable categories. On the other hand, just because I have arbitrarily assigned them to the same category, following tradition in swimming and in other sports, I cannot assume that every swimmer in the les autres category has a similar chance of winning a gold, silver, or bronze medal.

This logical difficulty with categorization is just one of the problems facing the classification researcher. Here I have attempted to analyse the general pattern in the relationship between types of impairments and swimming performance. There are still a lot of questions about this relationship that need to be examined in more detail. For example, there are no studies to examine the relationships between types of impairments and swimming performance in each event and events in S, SB, and SM classes. It would be very useful to know, further, whether this relationship holds in lower and in higher classes. The current classification system has a few problems in SB classes so whether the results in events of SB class swimmers are different from those in other events we do not know. Future studies need to monitor the relationship and also examine it in greater detail.

6.6 Conclusion and Implication

If a swimming classification system is fair, theoretically, performances across classes should be different; elite swimmers in the same class should demonstrate similar performances; and elite swimmers with different types of impairments should have equal opportunities to advance to the finals and win medals. In this study, an analysis of the relationship between swimming performance and classes, and of the relationship between impairment and swimming performance at the 1996 Paralympic Games generally supports the current swimming classification system with respect to generating fair competition for most swimmers (see Table 6.6). It is recognised that the current swimming classification system is not perfect and I have pointed out the anomalies between some classes and some events (see Table 6.6). There remain many research questions that need to be examined and the weak points in the current classification system need to be adjusted and improved. For example, the results in this study showed that some SB classes and some S classes in butterfly events appear to be particularly problematic. I hope the discussion will be useful as SAEC-SW classifiers continue to fine-tune the classification system and I would encourage more researchers to collaborate with them.

It is very important that studies using different sports science perspectives should be undertaken to clarify many of the ambiguities that still exist in the classification system and to de-mystify those aspects of it which classifiers and swimmers take for granted. Many factors such as coaching, swimmers' techniques, swimmers' physical conditions, and swimmers' ages, influence swimming performance and they do so in a variety of ways and in many combinations. I would suggest, therefore, that there is a role for many other research approaches in the examination of performance outcomes. The present study needs to be replicated at every major swimming competition but it should be accompanied and complimented by studies that focus on other variables. Disability swimming needs a systematic and coordinated approach that involves classifiers, administrators, swimmers, coaches, and sports scientists. The SAEC-SW has established a Swimming Science Committee and it is pressing for collaboration to occur. I hope that this study has contributed to that process and helped the revision of the functional classification system.

Table 6.6 Summary Table to Examine Three Theoretical Conditions

	Support	Anomaly
Condition 1	a. There were significant differences in swimming speeds across classes in all male and female events. b. There were acceptable patterns between classes and performances in all events.	a. The mean speed of S7 swimmers was faster than S8 swimmers in both male and female butterfly events ($p > .05$). b. The mean speed of SB3 swimmers was faster than SB4 swimmers in both female events ($p > .05$).
Condition 2	a. There were high Spearman correlation coefficients between swimming speeds and classes in all male and female events. b. There were acceptable standard standards of swimmers' speeds in most swimming events.	Standard deviations in female classes S3, S4 and S5 were slightly higher (over 0.10).
Condition 3	There was no significant dominance by any of the six impairment groups between participants and medalists, and between participants and finalists in male, female and total swimmers.	Female swimmers with CP and les autres won significantly more gold medals than those with poliomyelitis and dysmelia ($p < .05$).

CHAPTER 7
GENERAL DISCUSSION OF THE SWIMMING CLASSIFICATION RESEARCH

7.1 Introduction

Having presented three empirical studies of swimming classification in the three previous chapters, it is now necessary to thoroughly discuss the swimming classification research and look at the classification model which was presented in Chapter 1 (see Figure 1.1) and Chapter 3 (see Figure 3.1) again. Thus, an entire view of the classification research and an understanding of disability swimming classification as a social process can be established. Most importantly, an appropriate classification model can be developed more completely.

Although the sub-problems of the three previous empirical studies were answered individually, generally speaking, the classification research has not been understood systematically. Thus, this chapter is an attempt to integrate results of those empirical studies and the classification literature to (a) discuss problems in swimming classification, (b) identify the changes of the swimming classification systems as a social process, and (c) revise and explain the classification model.

In addition, the classification system, the classification process and classifiers are three fundamental elements in swimming classification (Figure 7.1). It is necessary to examine each of them. But most importantly, in a systematic classification study those elements need to be discussed together and also relationships among them need to be clarified. Thus, the complexity of swimming classification could be understood more clearly.

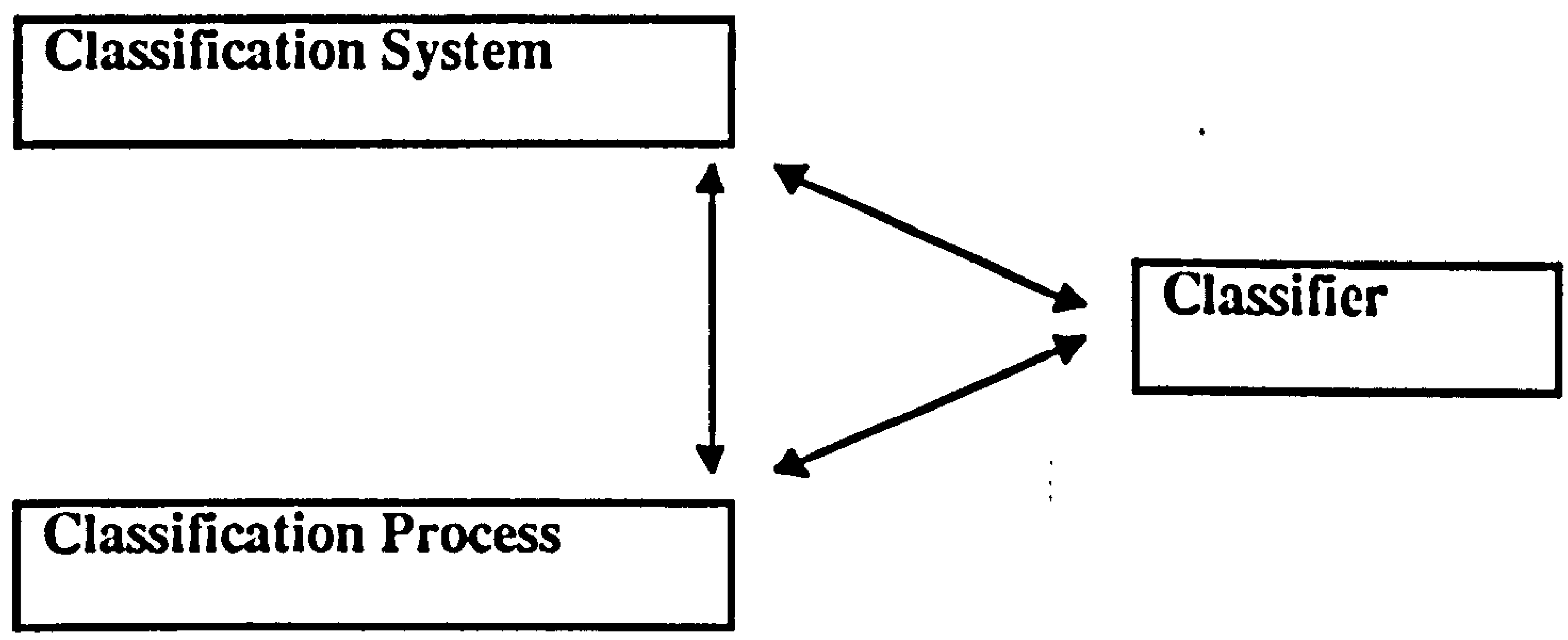


Figure 7.1 The Fundamental Elements in Swimming Classification

7.2 The Fundamental Elements in Swimming Classification

7.2.1 Three Elements

In this research project, the three fundamental elements in swimming classification- the classification process , classifiers, and the classification system, were examined and discussed in Chapters 4, 5 and 6, respectively. Their importance in swimming classification research was also reported in those chapters. If there are problems in any element, swimming classification will be affected and so fairness in the swimming competition will be disturbed. For example, without competent and well-trained classifiers, who would be able to conduct a fair classification? Without the classification system, how can classifiers use objective criteria to classify swimmers into appropriate classes? Without good interactions among swimmers and classifiers and the clear classification process and procedures, how would swimmers be classified properly and fairly? I believe that each element plays an equal and important role in swimming classification and each element must not be neglected by researchers and practitioners.

Only clarification and discussion of each individual element without considering their relationships of elements, however, may have some limitations in using the concepts whether from practical, theoretical or research perspectives. Their mutual relationships to the three elements need discussing so that the whole view of disability sport classification may be established more appropriately.

7.2.2 The Relationship between Classifiers and the Classification System

Classifiers develop the classification system and then use it in practices. If they find problems in the classification system, they may revise it to make it better and fairer. On the other hand, the criteria for the evaluation of an authorised classifier have been recorded on the classification system so that the behaviour of classifiers can be controlled appropriately by the code of conduct of classifiers and related rules. The guidelines (i.e., classification system) are constructed by classifiers and then a consensus among classifiers is established by using the standard rules in the classification practices. Simultaneously, the guidelines can also restrict classifiers' actions and control their power to meet the needs of SAEC-SW. Classifiers and the classification system have an obvious link.

7.2.3 The Relationship between Classifiers and the Classification Process

Classifiers not only use the classification system to classify swimmers, but they also need to conduct appropriate evaluations (i.e., bench and water tests) and handle the classification process clearly and successfully. However, it is not always easy for classifiers to control the complex classification process. Thus, classifiers need to learn how to interact with swimmers and other classifiers through the long-term participation and socialization process. Finally, they must understand and be familiar with the entire classification process so that most of the social practices occurring in the process can be managed well. In addition, when the classification process is adjusted and changed, classifiers need to change their original routines to adapt their expected role in swimming classification. Classifiers and the classification process are mutually influenced (Giddens, 1984).

7.2.4 The Relationship between the Classification System and the Classification Process

The classification system and the classification process also have an apparent relationship. When classifiers apply the classification system in the actual classification process, they need to recognise that some practices in the classification process may not run smoothly. Thus, they may revise the classification system, and then try to use the revised system in the classification process. If the classification outcomes are satisfactory, the revised classification system and the process would be accepted by swimmers, researchers and practitioners. Otherwise, the system and the process may be changed again. It seems that the relationship of the classification system and the classification process is inseparable.

In summary, having (a) knowledgeable medical and technical classifiers, (b) an appropriate classification system and (c) clear classification processes, are the three necessary elements in a fair swimming classification. Specifically, classifiers use several resources in the actual classification process, and produce and reproduce rules and social practices. They are the main social agents to maintain social order in the disability swimming social system and its classification structure and mediators to influence rules, resources and social practices (see Figure 7.2). However, most of the previous literature discussed or evaluated classification systems but neglected the importance of the elements of classifiers and the classification process (Vanlandewijck & Chappel, 1996). As a result, the previous classification literature (see Chapter 2) has its limitations for policy-makers to establish complete concepts and develop systematic and effective strategies in order to fully maintain fairness in classification and competition. This research project, however, recognises the problem and tries to clarify the three fundamental elements in classification and understand their relationships for practical uses.

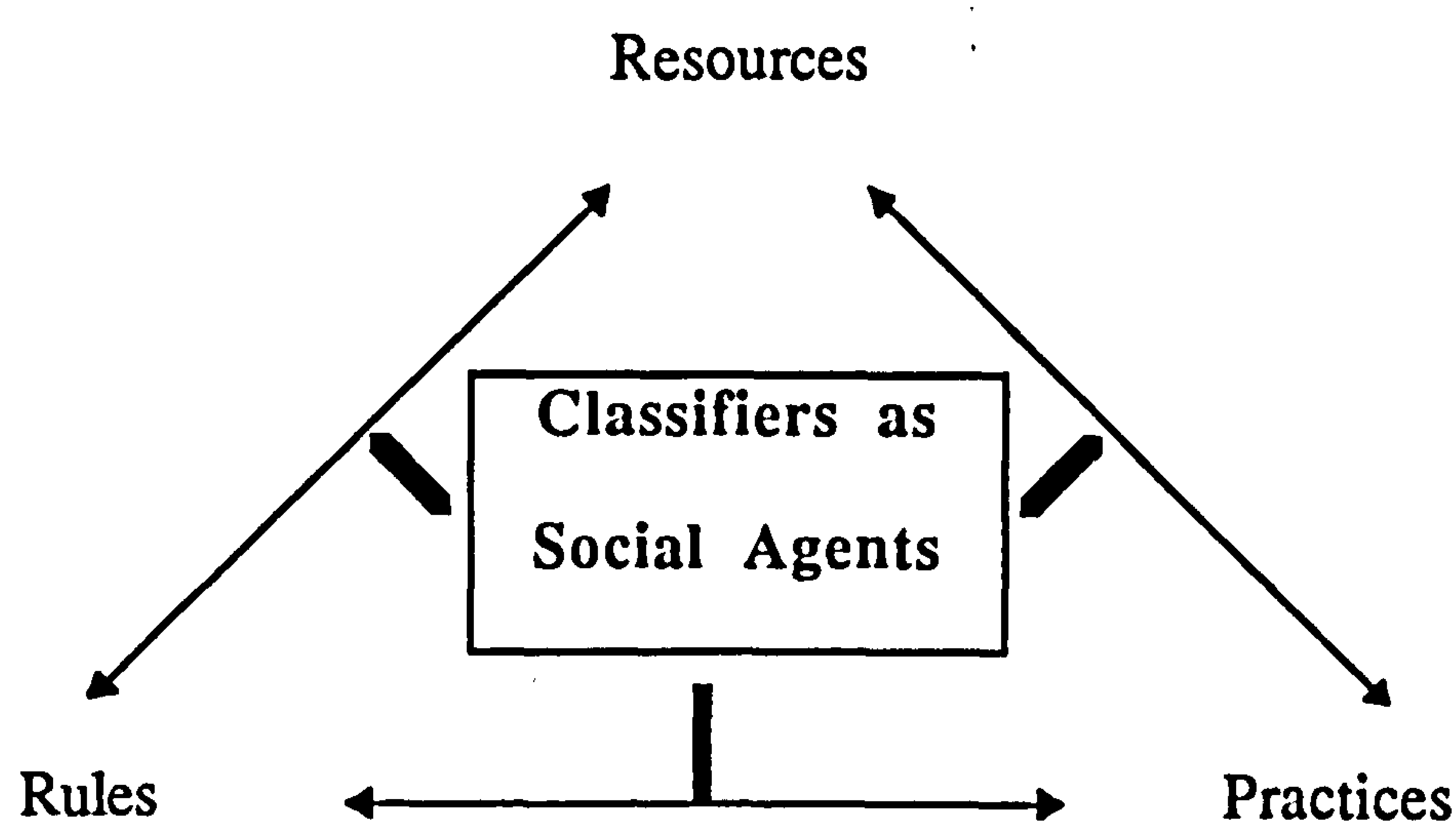


Figure 7.2 Classifiers as Mediators in the Relationships between Resources, Rules, and Social Practices

7.3 Problems in Swimming Classification

In the development of a classification model, several problems in the classification process, classifiers and classification system were identified. Some of them were mentioned in Chapters 4, 5 and 6. In this section, several important problems in the classification process, classifiers and classification system are summarised and listed in order that (a) SAEC-SW and relevant people may consider them systematically and then (b) possible solutions for those problems could be developed in the future.

7.3.1 Classification Process

Although swimming classification is a complex process, the classification process is handled by classifiers and relevant social actors quite adequately. However, five problems in the classification process can be recognised specifically. First, an adjustment of swimmers' water test points may be too subjective. It depends mainly on the discussion between medical and technical classifiers and technical classifier's interpretations in swimmers' functions. Sometimes SAEC-SW medical and technical classifiers could not explain this process clearly especially when they classified borderline swimmers (FN, 14/8/96, PG). It would be more appropriate for SAEC-SW to investigate this issue in detail and then develop clear procedures to deal with it.

Second, power relations among social actors (i.e., between senior and junior classifiers, between medical and technical classifiers and between classifiers and swimmers) in the classification process are uneven (see Section 4.5.5). A few senior classifiers have apparent power and authority to dominate the classification process and to decide the development and revision of disability swimming classification (FN, 25/8/96, PG). When they can carry out their roles properly, the social order in disability swimming and fairness in competition can be maintained successfully. If SAEC-SW does not control them properly, the use of only the classifier's perspective in the classification process may be too dangerous because the athlete's perspective and values may be neglected. With respect to this issue, Strohkendl (1996) and Craven (1990) argued that the classification process should not be controlled by a few people. They suggested that it is important for athletes to be allowed to participate actively in the classification process and understand their classes. If this idea is accepted by SAEC-SW and social actors in the classification group, perhaps an adequate balance of power relations among social actors in the classification group needs to be taken into account by SAEC-SW.

Third, a few classification procedures are sometimes changed, in particular, when the classification system is revised. As a result, a few classification routines which have been developed by classifiers need to be appropriately adjusted and re-established. However, if some classifiers do not recognise the changes of the classification practices and still use the old routines in classification, the outcomes of classification and the social interactions among social actors may be affected. More seriously, conflicts among social actors may occur. For example, classifiers may argue why they should conduct different classification procedures and who is conducting classification correctly (FN, 8/10/98, WSC). In addition, swimmers' rights may also be affected because of the diversities.

Fourth, a few conflicts among social actors have been discovered during the classification process. It is believed that some conflicts may be avoided if SAEC-SW classifiers patiently explain classification results to swimmers and coaches and also clarify their concepts and questions. This is because some swimmers and coaches can misunderstand the classification system and the classification process. However, a few conflicts have arisen because a few SAEC-SW classifiers abuse their power and authority and employ unethical behaviours in classification. For example, one classifier argued that the classification knowledge and ability of the classifier from western countries is better than that of swimmers, coaches and classifiers who are not from western countries (FN, 10/10/98, WSC). This kind of incident may create a potential crisis and challenge for SAEC-SW to maintain its authority and the social order in disability swimming if SAEC-SW does not resolve it properly.

Fifth, a few swimmers try to gain an advantage in classification. They may not fully cooperate with classifiers. In other words, they do not intend to demonstrate their actual abilities in the classification evaluations. For example, one swimmer demonstrated that he could not use his legs in bench tests. Surprisingly, he stood up and used his legs to kick his friends during an informal social activity (FN, 15/10/98, WSC). In particular, some swimmers understand that (a) it is very difficult to prove they have been "cheating" and (b) there is no significant punishment for the behaviour of classification cheating. Thus, a few swimmers may take a risk and use this unethical method to gain advantages and win medals unfairly (Davis & Ferrara, 1996). It is suggested that SAEC-SW considers this issue seriously and develops strict rules to sanction swimmers with intent to cheat in classification. Therefore, most swimmers who obey rules can be protected and fairness in swimming competition can still be maintained.

7.3.2 Classifiers

Having discussed the main features of SAEC-SW classifiers and identified the role of classifiers in Chapter 5, five problems related to the issue of classifiers have been discovered. First, there are only a few competent classifiers in disability swimming. In particular, technical classifiers are urgently required because they need to conduct the water test which is one of the most important procedures in swimming classification. Only experienced technical classifiers can handle the process of the water test appropriately (IN, 8/8/97, ESC). However, it is always difficult to train people to become authorised technical classifiers because they need to have a lot of swimming knowledge and classification experience and also need to understand the meanings of physical evaluations and characteristics of impairments of swimmers (SAEC-SW, 1998). In other words, technical people also need to spend a lot of time learning medical knowledge and understanding the bench test. It is such a challenge for technical people. Although this problem is crucial, SAEC-SW does not plan to adjust their standards for authorising classifiers because their abilities and the quality of classifiers are more important than the quantity of classifiers in disability swimming (A. Green, personal communication, November, 1998).

Second, the training of competent classifiers is a long process. There are a lot of swimming classifier trainees in the social world. However, some of them may recognise the difficulty and challenge to become authorised classifiers and give up their opportunities to attend more classification training. As a result, their previous training and efforts in classification may be wasted. It is suggested that SAEC-SW may encourage trainees who have participated in classification for several years and have had great potential to be authorised to keep attending classification seminars and undertaking actual classification practices. It is expected that there will be a plenty of classifiers and trainees who can help in the development and promotion of disability swimming as well as classification in the future if this suggestion is applied successfully.

Third, SAEC-SW classifiers have heavy work load and pressure during the international championships (e.g., Paralympic Games, World Championships and European Championships). They not only classify swimmers but also participate in many meetings because they always concerned with the fairness of competition. It is found that they are so professional that other people could not replace them (IN, 15/10/98, WSC). If SAEC-SW depends on authorised classifiers to maintain fairness in competition, their overload during the competition may affect the quality of classification. An appropriate adjustment of their classification work needs to be considered.

Fourth, constancy of classifiers is always problematic in disability sports (Davis, 1994; Richter, et al,. 1992). In this study, it is observed that some SAEC-SW classifiers have a lot of classification knowledge and experience but some may have less. Misclassification sometimes occurs in disability swimming because classifiers may make mistakes (IN, 10/10/98, WSC). To clarify the issue, it is suggested that two approaches need to be considered in the future study. First, the reliability of the classifier teams needs to be examined; and second, the criteria for the objective evaluation of trainees and classifiers need to be developed.

Fifth, team work in swimming classification is very important but full cooperation between medical and technical classifiers may be a potential problem. Although medical and technical classifiers currently cooperate very well, it is observed that technical classifiers are more dominant in the entire classification process. Their decisions are more powerful than other social actors (e.g., FN, 14/8/96, PG; FN, 4/8/97, ESC). If technical classifiers do not consider medical classifiers' opinions and communicate with other social actors properly, some arguments or conflicts may happen in the future. It is suggested that (a) SAEC-SW needs to take this issue into account carefully and (b) every classifier should be educated to recognise the importance of other classifiers whether they are medical, technical, senior or junior classifiers and to respect their contributions to swimming classification.

7.3.3 Classification System

With respect to the fairness of the functional swimming classification system, there are limited research studies that support it (e.g., Green, 1993). Although the classification system was evaluated in this study (see Chapter 6), many questions related to the system still have not been examined and answered (Richter, et al., 1992). It is summarised as three main issues.

First, contents of the classification system need to be examined in more detail. Specifically, physical and functional evaluations and rationales of the classification system need to be explained clearly. Many people wonder how and why swimmers with different types of physical impairments could compete together (McCann, 1991, 1994a; Richter, et al., 1992). In addition, when using the functional classification system, do any types of impairments of swimmers gain advantages fairly (Chappel, 1994; Richter, et al., 1992)? Although this study has partially answered the question, it is worth mentioning that the SAEC-SW is developing a research plan to monitor longitudinally its classification system. Currently, the revision of the classification system relies mainly on classifiers' experience and feedback (A. Green, personal communication, November, 1997). Although the classification system is adjusted regularly, it will be important that more evidence-based results are used for the revision of the system.

Second, this study has shown that a few classes in the 1994 classification system may need to be fine-tuned. Although this study has identified that no specific types of physical impairments of swimmers dominated the winning pattern or always lost at the 1996 Paralympic Games, it did not compare different types and severities of physical impairments of swimmers in each class. The macro-view of this study to examine the relationships between classes, performances and impairments may only help us understand that the 1994 classification system was in general fair.

Third, more information, such as criteria for evaluating classifiers and trainees, the entire classification process and procedures, should be added to the classification system. Thus, the linkage of the classification system and the classification process in disability swimming is more understandable and clear for swimmers, coaches and trainees. As a result, a misunderstanding of swimmers and coaches in classification may be reduced. In addition, the classification rules will be more complete for application in actual social practices.

7.3.4 Differences between National and International Classification

In this project, the researcher participated in several international and national swimming championships (see Table 3.2). When classification was conducted in different times and places, it was observed that the outcomes of classification might not always be the same. Giddens (1984) mentioned that social systems and social practices are always changeable not constant. They are influenced by the concept of "time-space". Regarding the factor of different times in classification, for example, a few swimmers may be assigned to different classes between the 1992 Paralympic Games and the 1996 Paralympic Games. The changes of classification systems at different times will be discussed in the Section 7.5. When examining the social process of swimming classification in different places, it is appropriate to compare swimming classifications which are conducted in the international and national championships.

Generally speaking, there are five main differences between national and international swimming classification. They can be categorised as (a) classifiers, (b) swimmers, (c) classification process, (d) classification settings, and (e) results of classification. They are now discussed in this section.

7.3.4.1 Classifiers

It is often observed that medical and technical classifiers may not work together in national classification. The main reason is that only five countries (e.g., Australia, Canada, Britain, Spain, and United States) have both medical and technical classifiers and only nine countries have either medical or technical classifiers. However, we can recognise that most of the time either medical or technical classifiers will work with trainees in national championships. As a result, classifier trainees need to play a crucial role in national classification. They can conduct bench and water tests by applying their classification knowledge which they learn from international classification seminars and authorised classifiers. This is a good opportunity for trainees to enhance actual practical experience. Although this is not the best approach in conducting classification according to the SAEC-SW classification rules, at least national swimmers can be assigned into possible classes to attend national championships. However, if they are classified by classifier trainees or only one authorised classifier, SAEC-SW does not recognise swimmers' national classes as international classes (SAEC-SW, 1998).

7.3.4.2 Swimmers

The performance levels of swimmers between the national and international championships are apparently different. Theoretically, classification should not be affected by the skills of swimmers. Actually, the skill levels of swimmers may partially affect the classification outcomes. For example, a lot of developing and new swimmers participate in national championships. Those developing swimmers may perform with immature or incorrect swimming skills in classification and competition. If classifiers or trainees do not notice the poor training of swimmers, they may think that those swimmers have poor functional abilities. As a result, swimmers may be assigned to lower classes and be unfairly advantaged. Conversely, a lot of elite and talented swimmers participate in international championships especially Paralympic Games and

World Championships. If those swimmers perform with "good" functional abilities and swimming skills because of appropriate training, coaching and compensation of movements and if classifiers do not observe those movements carefully, then elite, talented or well-trained swimmers may be assigned to higher classes. In other words, those swimmers may be penalised by the neglect of classifiers (McCann, 1991, 1994a). Thus, classifiers and trainees need to notice the difference of swimmers between national and international championships. Classifiers' mistakes in classification may therefore be reduced.

7.3.4.3 Classification process

Theoretically, the classification process in national championships should be similar to that in international championships because the same classification system is used. As discussed before, many countries do not have medical and technical classifiers so that the classification process and evaluation may not be accomplished properly in national championships (see Figure 7.3). For example, if swimmers are classified by only one medical classifier without a technical classifier, it is expected that the water test is likely not to be conducted completely. On the other hand, without a medical classifier in the classifier team the physical abilities of swimmers may not be properly evaluated. In other words, the classification process may be shorter and more informal in national classification where a proper classification team which includes one medical and one technical classifiers could not be made up. In addition, a shorter discussion among examiners often occurs in national classification. Usually the senior examiner in national championships makes direct decisions for swimmers' classes (e.g., FN, 28/2/97, BJSC)[1]. Also observation during competition is often neglected by classifiers and trainees so that most swimmers' classes may not be double checked in national championships (e.g., FN, 1/11/96, BSSC).

[1] BJSC means the British Junior Swimming Championships. BSSC means the British Short Course Swimming Championships.

Moreover, swimmers in national championships seldom appeal and protest their classes. It is very difficult to recruit two or three authorised examiners to make up a classification panel to deal with classification protests. If swimmers or their coaches and parents do not like their classes, they may directly ask classifiers or trainees to conduct the water test again or observe their functions during the competition. It is often observed that coaches or parents participate in the negotiation of swimmers' classes, especially when classifiers or trainees do not have a lot of classification experience.

There is a specific feature in the classification process during national championships. When classifiers decide classes for developing or poorly-trained swimmers, they may depend mainly on the results of the bench test because the poor swimming skills of those swimmers may not represent their real functions and swimming abilities. Thus, in national championships classifiers may need to *guess* possible classes for a lot of developing or poorly-trained swimmers (A. Green, personal communication, March, 1998). When those swimmers mature with better swimming skills, they will be classified again in the future. In other words, a lot of young and developing swimmers do not hold the "permanent" status of their classification.

National classification is often arranged during the competition (e.g., FN, 1/11/96, BSSC). As a result, classifiers or trainees may not have a lot of time to classify each swimmer in national championships because swimmers use the free time to attend classification and they may have other swimming events later. Also, because classifiers or trainees need to conduct a lot of classifications during the competition, they would not be able to observe most swimmers' functions in competition. This part is completely different from the classification process in international championships.

Note: [shaded box] this process may be different between international and national classification

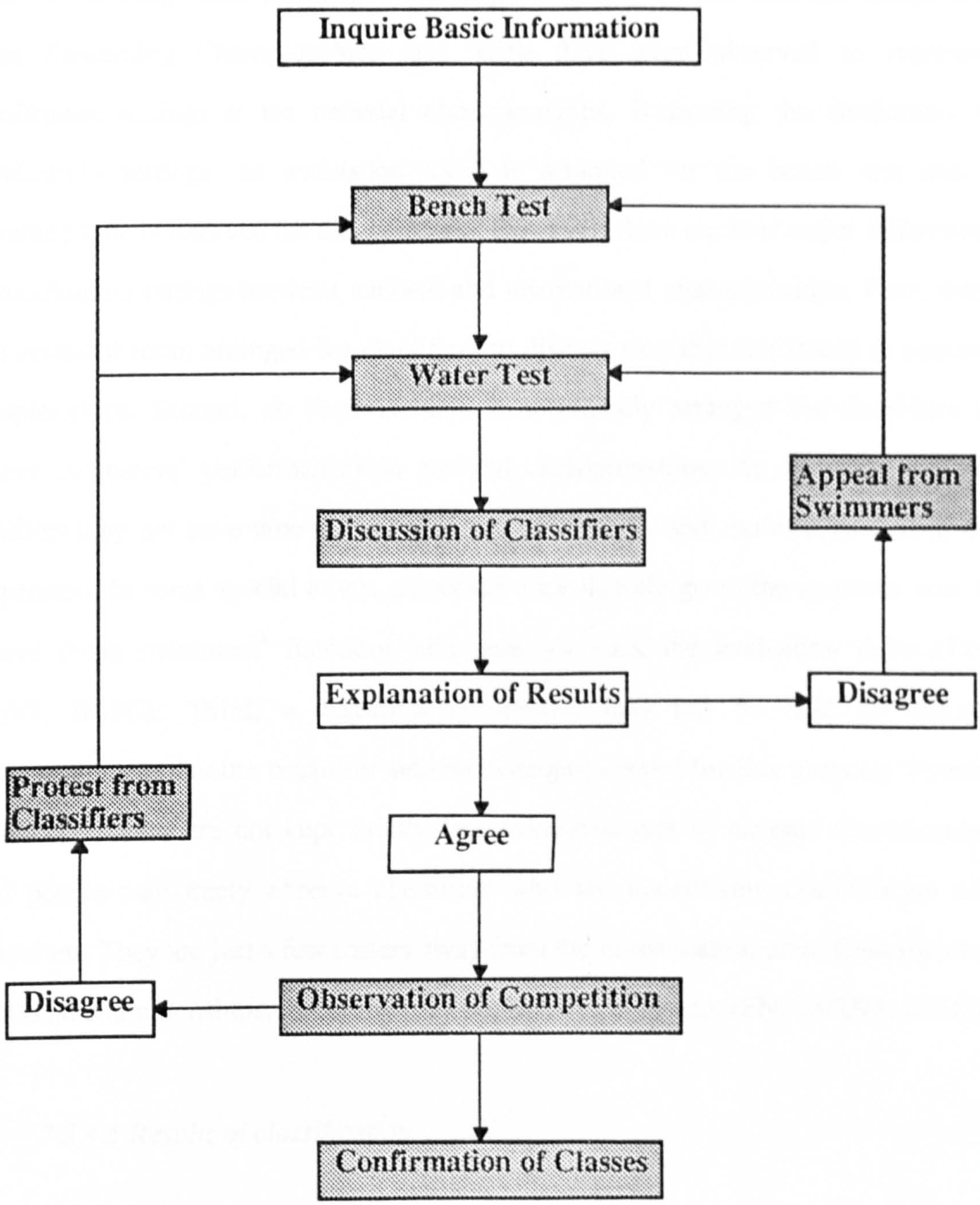


Figure 7.3 Procedures and Stages in National Swimming Classification

7.3.4.4 Classification settings

Classification settings have some similarities and also have some differences when national and international championships are compared. In this study, only British Swimming Championships including the Short Course Championships and Junior Swimming Championships (see Table 3.2) were observed to represent classification settings at the national championships. Regarding the similarities in classification settings, an evaluation room is arranged for the bench test and a swimming lane is reserved for the water test. However, there are four major differences in classification settings between national and international championships. First, there is no reserved room arranged for classifiers to discuss classification issues in national championships. Second, no reserved area is specifically arranged for classifiers to observe swimmers' performances in national championships. As discussed before, classifiers may not have time to observe swimmers' skills and movements during the competition. In some special cases, classifiers may directly go to the spectator area to observe those swimmers' functions and then go back the evaluation room (FN, 1/11/97, BSSC). Third, a classification seminar may not be held in national championships so that the organiser seldom arranges a room for this purpose. Fourth, classification areas are not kept strictly free from strangers in national classification. Other people may freely observe classifiers who are undertaking classification and evaluations. They are just a few meters away from the classification area. Classification in national championships, therefore, may not be so confidential (FN, 28/2/98, BJSC).

7.3.4.5 Results of classification

Considering the above four factors, the quality of classification in national championships may be poorer than that in international championships. Generally speaking, the quality of classification in current international championships is controlled well. This is because the proper classification process is conducted, and authorised medical and technical classifiers are specifically selected by swimming organisers and SAEC-SW to carry out classification. On the other hand, classification which is conducted in national championships may have more limitations and problems which were discussed before. Despite those problems, most classifications which were conducted at the British Championships were satisfactory. Most swimmers and coaches were happy to accept their classes and enjoyed the competition.

Perhaps it is favourable that Britain has three SAEC-SW classifiers and two trainees to help classification. Many countries, however, may not have any classifiers to conduct bench tests and water tests. As a result, some coaches may use their observation experience to guess possible classes for their national swimmers. In this study, much of the observation data was collected only at the British Championships. Thus, it is very difficult to point out other problems in national swimming championships in other countries. One important problem is specifically reported here. That is, swimmers' national classes may be changed in international championships. If swimmers' classes are lower in international championships, swimmers are always happy to accept them. However, if swimmers are assigned to higher classes in international championships, it is very difficult to persuade them to accept the challenging changes. Even if they do not like these new classes, they still need to use them to attend competition. Sometimes a few swimmers complain of unfair classification and have apparently emotional responses after knowing the classification results. Some of them may even drop out the competition because they refuse to accept the new classes. It is suggested that the SAEC-SW and classifiers need to consider this problem seriously. In addition, if swimmers are unfortunately changed into higher classes before competition, coaches and team managers need to take particular care of those swimmers.

Table 7.1 Summary Table for Comparisons of International and National Swimming Classification

	International Classification	National Classification
Classifiers	SAEC-SW classifiers including medical and technical classifiers in the classification team.	May not have medical and technical classifiers in the classification team.
Trainees	Help SAEC-SW classifiers to conduct classification but trainees may not play a main role in the classification team.	May play a main role in classification.
Swimmers	Many elite and mature swimmers and only a few developing swimmers.	A lot of developing and new swimmers and some elite and mature swimmers.
Process	Follow the typical international classification processes (see Figure 4.1).	Evaluations and discussion among classifiers or trainees may be shorter. Almost no formal classification protests, observation during competition and classifiers' meetings.
Classification Settings	Have a medical room for bench test, a reserved lane for water test, a meeting room for discussion, and a reserved area for observation of competition.	Have a medical room for bench test and a reserved lane for water test but no reserved rooms or areas for discussion and observation.
Seminar	Classification seminars are conducted in many international swimming championships.	Classification seminars are seldom conducted in national championships.
Quality of Classification	Very good in most IPC sanctioned swimming championships.	It depends but generally it is satisfactory in Britain.

7.4 Classification Systems Used in the Practical World

Discussion of the fairness of competition is a very important theme in able-bodied or disabled sports (Simon, 1991). Generally speaking, classification is developed for the purpose of fairness in sports. Using objective classification systems in disability sports is the consensus of athletes, classifiers, sport managers, and researchers (McCann, Davis & Richter, 1994). However, as Vanlandewijck and Chappel (1996) argued, the perfect classification system does not exist but the *optimal* classification system does exist. They also suggested that any classification system used in disability sports needs to be examined scientifically.

The functional swimming classification system has been used in international competition since 1989 (Green, 1991). It integrated different types of physical impairments of swimmers to allow them to compete together. However, in the early application of the functional classification system (e.g., 1992 Paralympic Games) many problems were identified. Several researchers highlighted faults in this functional and integrated classification system (Chappel, 1994; Richter, 1994; Richter, et al., 1992). After many discussions among senior classifiers, the classification system has since been revised several times by SAEC-SW and its classifiers. Generally, the system has been improved better and is more consistent (J. Chippington, personal communication, November, 1997). For example, when this revised system (i.e., 1994 edition) was applied in the 1994 World Championships, 1995 European Championships and 1996 Paralympic Games, many people responded favourably in support of the classification system (Wu, 1997). In other words, the swimming classification system in general achieved its main purpose to maintain the fairness of competition and the classification process in international championships was organised more effectively by SAEC-SW. In particular, many swimmers accepted this fairer system. Also, the strength of competition was significantly improved.

Although there are a few problems that still relate to the 1994 classification system (see Section 7.3.3), it is apparent that SAEC-SW successfully improved its classification system and used it in the practical world. I believe that it is important to understand the features of the swimming classification system in depth. Perhaps the identification of these features in this study can be useful reference for other disability sport committees to examine and improve their classification systems.

After examining the contents of the current SAEC-SW classification system, seven important features of the system are identified. First, it is a sport-specific classification system not the traditional medical-based classification system. For example, classification evaluations, classification procedures, the number of classes, the criteria for each class, and minimal impairments for swimmers to participate in disability swimming may all be different from those in other disability sports. Indeed SAEC-SW considers the specific needs in disability swimming to develop and revise its own system. Second, it is an integrated classification system. Swimmers with different types of physical impairments are allowed to compete together. The general principle of arranging swimmers into specific classes relies mainly on evaluations of the physical and functional abilities of swimmers not their impairments and disabilities. The integration of different types of physical impairments helps improve the quality of competition (Hainey, 1994; Lindstrom, 1994a).

Third, medical and technical points of view are included together in the classification system and process so that misclassification may be reduced. In particular, disability profiles and practical profiles of each class are reported in the current classification system in great detail (SAEC-SW, 1998). Obviously, swimmers' cheating in classification can be reduced because swimmers may recognise that a lot of SAEC-SW classifiers are observing their functional performances during the competition or the functional evaluation. Those classifiers have professional classification knowledge, and also medical and swimming expertise. Also, other swimmers and coaches can read the practical profiles which are clearly written in the classification manual to double check all swimmer's functional abilities, skills and classes during the competition.

Fourth, the number of classes is decided in a reasonable range (i.e., 10 classes for S and SM events and 9 classes for SB events in the newest edition of the classification system). Thus, on the one hand, the fairness of competition can be maintained. On the other hand, the quality and strength of competition is improved. It is becoming more difficult for swimmers to advance to finals and win medals because more swimmers now compete in each class and swimming event. In addition, using the functional classification system, most events can be held normally. The combination of different classes and cancellation of events is significantly reduced (Hainey, 1994).

Fifth, the classification system is more readable and understandable for medical and technical people who are not authorised classifiers. Although medical people may understand more in disability profiles and bench tests and technical people may understand more in practical profiles and swimming skills, they could choose to only read the related parts of the system which they understand. This would allow them to establish some basic classification concepts. Clearly, the classification knowledge and manual is understandable not only for classifiers or medical people but also for technical people and swimmers.

Sixth, the detailed rules, such as classification procedures, protest rules, criteria for becoming SAEC-SW classifiers and trainees, and the code of conduct of classifiers, are reported in the current classification system. Thus, classifiers and swimmers can follow clear rules to attend classification and competition and also realise how their rights can be protected. In addition, the tendency for swimmers to bend the ambiguous classification rules to gain an advantage in competition or for classifiers to misinterpret the ambiguous classification rules which assign swimmers into disadvantageous positions is reduced (Davis & Ferrara, 1996).

Last, the swimming classification system is revised regularly when mistakes or obvious problems which relate to the system are identified by practitioners or researchers (Williamson, 1997). For example, the SAEC-SW classification manual has been revised over 5 times since 1994. When classifiers applied the revised system, the quality of classification and the fairness of competition appear to have been improved (A. Green, personal communication, October, 1998). McCann (1984) argued that classification is never static and unchangeable. It is produced, reproduced or transformed by social actors (Giddens, 1984). The changes of the functional classification system and the related changing process and background will be discussed in the following section.

7.5 Changes of the Classification System

7.5.1 History of the Swimming Classification Systems

Changes of the swimming classification systems are a long and complex process. Reviewing the previous swimming classification manuals (e.g., 1988 classification system, 1990, 1992, 1994, 1996 and 1998 functional classification manuals), some differences among those editions of the classification systems can be identified. They are described briefly in this section.

Generally speaking, before functional classification has been used in international competition, the medical classification systems were extensively used in disability swimming. Only swimmers with similar types and severities of physical impairments compete together. Using the medical classification systems in swimming, theoretically, there were 31 classes for swimmers (i.e., 8 classes for SCI, 8 classes for CP, 9 classes for amputation and 6 classes for les autres). If the other classification factor- gender was considered in the competition, for example, there were *62 gold medals* in the 50 meters freestyle. It was recognised that the quality of competition was poor because only a few swimmers were competing in most classes (Green, 1993; Hainey, 1994). The administration of events was also inefficient and a long schedule for competition may be ridiculous (Shepherd, 1990). In addition, when using the medical classification systems in swimming, the combination of different classes occurred frequently leading to unfairness. Many events in lower classes were even canceled so that swimmers with severe impairments would lose opportunities to show their abilities in competition (Hainey, 1994). Moreover, spectators and media reporters ended up just being confused by so many classes and winners. Some characteristics of the medical classification systems are summarised in Table 7.2.

As the above problems were recognised in disability swimming when using only medical classification, the concepts of functional classification and integration of different types of physical impairments were introduced. A working group was organised in 1981 to create the functional classification system. The first trial of the functional system was in Fulda in 1985 when for the first time the functional classification system was tested in actual competition (Green, 1997b). However, most swimmers were not familiar with the new system and the competition was not noticed by many people. It was not generally apparent that medical people rejected the idea of functional classification in the mid-1980s.

The movements and progress of functional classification were encouraged by the 1987 Arnhem seminar and the successful application of the player classification system in wheelchair basketball (McCann, 1987; Steadward, 1996; Strohkendl, 1986). After the 1988 Paralympic Games, the functional classification system in disability swimming developed more appropriately. In particular, this integrated system was formally used for swimmers with different types of physical impairments except swimmers with CP at the 1990 World Championships. The functional classification system nearly replaced the traditional medical classification systems. After the major contributions of several senior classifiers, this functional system was finally accepted to integrate all types of physical impairments of swimmers together at the 1991 European Championships and 1992 Paralympic Games (Green, 1997b). This was an important milestone in the history of disability swimming because the functional classification system was extensively used in international swimming competition. However, after the 1992 Paralympic Games, the functional classification system was strongly criticised by a lot of researchers (e.g., Richter, 1994; Richter et al., 1992). They have shown that swimmers with CP and SCI were in a disadvantageous position in competition when the functional classification system was used. Conversely, swimmers with amputation and dysmelia became dominant among the winners (Chappel, 1994). Findings of those studies suggested that the 1990 functional classification system was a faulted system (Richter, et al., 1992).

Although a lot of problems in the 1990 functional classification system were identified, integration of different types of physical impairments of swimmers in a competition was not rejected by most swimmers (Green, 1993; Hainey, 1994). However, the challenges and debates from practitioners and researchers have accelerated the changes of the 1990 edition of the SAEC-SW classification system. Obviously, several actions were undertaken by SAEC-SW after the 1992 Paralympic Games (J. Chippington, personal communication, November, 1997). First, the chairperson of SAEC-SW classification subcommittee resigned and national representatives in the General Assembly elected a new chairperson to deal with the controversial classification issues and improve the problematic functional classification system. Second, several SAEC-SW senior classifiers including medical and technical classifiers were recruited into the classification subcommittee to cope with problematic issues. Third, the study of Richter et al (1992) and comments and feedback from swimmers and coaches were taken seriously to improve of the classification system. Fourth, classifiers had regular discussions to identify the problems of the classification system and then proposed possible solutions. In particular, Green (1993) submitted a practical and technical proposal to SAEC-SW. She recommended an adjustment of the point system and parts of testing methods and more considerations of other factors such as body position, body balance and coordination of movements during swimming classification. If a classification system was fair, it was expected that no any types of physical impairment dominated the competition. In particular, swimmers with CP and SCI should not always lose.

The revised system has been developed in 1993 and applied in SAEC-SW sanctioned championships since 1994. However, SAEC-SW did not fully understand the outcome of the 1994 classification system. To examine the fairness and effectiveness of this revised system, several research studies have been particularly encouraged by SAEC-SW. For example, Green (1994, 1995a, 1995b, 1996, 1997a) has conducted a series of studies to examine the winning patterns among swimmers with different types of physical impairments in several international swimming championships. In addition, this research project was supported by SAEC-SW. A longitudinal study conducted by Wu and Williams to monitor the effectiveness of the classification system was also officially agreed by SAEC-SW sport science subcommittee (F. Biering-Soresen, personal communication, June, 1998). As a result of more research, some classification issues can be clarified in depth.

Green's studies and this project have shown that the 1994 classification system was in general fair. It was also recognised that swimming events at the 1996 Paralympic Games and 1997 European Championships were successful and fair (Green, 1996, 1997a; Wu, 1997; Wu & Williams, 1997). In particular, it was seldom heard that swimmers, coaches or researchers criticised the revised classification system (IN, 10/10/98, WSC). Many swimmers enjoyed the high level of competition. This significant improvement in disability swimming and classification, however, did not slow down the speed of continuous revision of the 1994 classification system because only a few problems remained. For example, a few problems in SB classes have been identified[2]. As a result, SAEC-SW classifiers recognised those problems and earnestly sought for possible solutions to refine the 1994 classification system after the 1996 Paralympic Games.

The newest edition of the functional classification system was produced by SAEC-SW in 1998. It was then used at the 1998 World Championships. The revised system has a few differences from the 1994 system. For example, some of SB classes

[2] Problems in SB classes were identified through the discussion of senior classifiers (FN, 25/8/96, PG). This study (see Chapter 6) confirmed those problems. The findings of this study have sent to SAEC-SW in August, 1997.

have been adjusted, the number of SB classes has been reduced and more practical profiles in S and SB classes have been added to the 1998 edition. In addition, classification rules and procedures have been recorded in great detail. The comparison of the 1994 and 1998 classification system is given in Table 7.3.

It was observed that the 1998 World Swimming Championships were held successfully. Most SAEC-SW classifiers thought that classification was fairer than any previous competitions in disability swimming. Reclassifications and protests of classification were apparently reduced. The classification process was controlled well. However, new issues related to classification were identified during the competition. For example, (a) the criteria of minimal impairments for swimmers to participate in disability swimming (Bailey, 1998a, 1998b; FN, 11/10/98, WSC), and (b) evaluations and measurements of multiple amputations and dysmelia of swimmers have arisen and been discussed extensively (FN, 14/10/98, WSC). A new subcommittee has been made up for the investigation of those issues (A. Green, personal communication, December, 1998). Understanding the long history of the functional classification systems, one can realise that swimming classification is never silent and static. It is expected that those issues will be clarified and the 1998 classification system will be revised again in 2002. Perhaps the optimal classification system may be developed in disability swimming at that time.

Table 7.2 Comparisons of the Medical Classification System and Functional Classification System for Swimming

	Medical Classification	Functional Classification
Systems Used in Paralympic Years	1984, 1988	1992, 1996, 2000
Kinds of classification systems	four kinds of impairment-specific and medical-based systems for swimmers with CP, SCI, amputation and les autres.	only one kind of sport-specific and functional-based classification system for swimmers with different types of physical impairments.
Number of classes	total 31 classes (i.e., 8 classes for CP, 8 classès for SCI, 9 classes for amputation and 6 classes for les autres).	10 classes for all types of physical impairments (except 9 SB classes in the 1998 classification system).
Classification evaluation	depends mainly on medical evaluations	need bench test (i.e., physical evaluations) and water test (i.e., functional evaluations)
Classifier	generally medical people	medical and technical people
Main strengths to use the system	a. classification is very fair b. classification evaluations conducted by medical classifiers are more consistent c. classification process is simple and easy	a. the effectiveness of the administration of competition is good b. the strength of the competition is high c. the system is more understood by swimmers d. classification is fair
Main weaknesses to use the system	a. too many classes confuse spectators and swimmers b. the strength of the competition is poor c. the administration of competition is not effective d. not sport-specific e. for swimmers, it was more difficult to understand f. many events are combined or canceled	a. classification evaluations conducted by classifiers may not be consistent b. more difficult to train competent classifiers c. contents of the system have not been fully evaluated d. classification process is complicated

Table 7.3 Comparisons of the 1990, 1994 and 1998 Functional Classification Systems

	1990	1994	1998
Systems used in Paralympic Games	1992 Barcelona Paralympics	1996 Atlanta Paralympics	2000 Sydney Paralympics
Number of classes	10 classes in S, SB & SM	10 classes in S, SB & SM	10 classes in S & SM, 9 classes in SB
Points in S class	170 points for arms, 50 points for trunk, 60 points for legs, 10 points for dive and 10 points for turn	130 points for arms, 50 points for trunk, 100 points for legs, 10 points for dive and 10 points for turn	130 points for arms, 50 points for trunk, 100 points for legs, 10 points for dive and 10 points for turn
Points in SB class	100 points for arms, 50 points for trunk, 130 points for legs, 10 points for dive and 10 points for turn	110 points for arms, 50 points for trunk, 120 points for legs, 10 points for dive and 10 points for turn	110 points for arms, 40 points for trunk, 120 points for legs, 10 points for dive and 10 points for turn
Contents of the classification manual	more medical information and a few functional profiles	more medical information and some practical profiles	a lot of medical and practical profiles & other information
Research	a little	a little	some
Length of the classification manual	about 30 pages	about 60 pages	about 90 pages

7.5.2 Changes of Classification Systems as a Social Process

In the previous section, the historical changes of the functional classification systems were reported. As Giddens (1984) noted, classification is produced, reproduced and transformed by social agents in the disability swimming social system. The changes of classification systems and classification practices are related to the exercise of power among social actors (Giddens, 1984; Watkins, 1975). For example, medical people had more power than technical people and athletes when medical classification systems were used in disability sports between 1950s and 1980s (Craven, 1990). When competitive disability swimming has moved into the concept of excellence of performance, swimmers and technical people have been empowered more by the social system (Craven, 1990; Steadward, 1996). Conversely, medical people could not fully control the classification practices and other social actors. As a result, the importance of medical-based classification practices in the social system has been reduced. Gradually, functional classification has replaced the position of medical classification in disability swimming. It is apparent that social struggle and resistance have occurred in the development and changes of functional classification.

During the changes from the medical model to the sport model in classification, the empowerment of athletes and technical people in disability sports has faced a lot of challenges from medical people (Craven, 1990; Strohkendl, 1991, 1996). For example, McCann (1991) stated that medical classification has a solid scientific basis and medical classifiers have medical knowledge and training to evaluate athletes' disabilities fairly. It is not appropriate that technical people only observed functional movements of athletes to decide the classes for athletes. McCann also noted that there is no medical basis for athletes with different types of physical impairments to compete together. The integration of different types of physical impairments of athletes just produced unfair competition.

Strohkendl (1996) has argued that McCann's viewpoints were the standard medical perspective and had an excessive emphasis on the differences and varieties of "disabilities". When medical classifiers used medical classification systems, the physical weaknesses and losses of athletes were seriously considered. Craven (1990) pointed out that athletes were treated like patients when medical classification was used in disability sports. However, McCann claimed that his idea and medical classification practices may protect athletes from being offended because many classes that are available for each type of physical impairments of athletes may encourage more athletes to participate in physical activities and sports (McCann, 1991). Sherrill (1993, 1998) argued that this medical-based model may be used in rehabilitation and recreation for people with impairments, but it should not be used in competitive disability sports. In addition, several researchers (e.g., Craven, 1990; Steadward, 1996; Strohkendl, 1996; Williams, 1994) argued that the values of competitive sports and winning are apparently ignored by many medical people who might have treated athletes as dependent, weak and incompetent.

Historically, some of the medical-based classification systems have been used in disability sports over 30 years. The tradition in classification has been developed and even consolidated; as a result, it may be more difficult to change (Shibutani, 1986). However, using the medical classification systems in disability swimming, the poor quality of competition has always been seen and discussed over two decades (Hainey, 1994; Lindstrom, 1986; Riding, 1994). Athletes should have a right to decide their needs in their sports. Indeed, elite athletes expected to attend the high level competition, not just participating in competition and winning easy medals. Clearly the integrated classification system could achieve this goal for most swimmers because more swimmers with different types of physical impairments could fairly compete together in each class and the number of swimming classes was obviously reduced. For swimmers, this integrated competition in disability swimming might become more valuable.

The tremendous change in the philosophy of classification has naturally been controversial since as strengths and weaknesses are evident in both medical and functional classification in disability swimming. Actually, no perfect classification exists in disability sports (Vanlandewijck & Chappel, 1996). Thus, the policy-makers developing classification rules should find a balance between the number of classes and the fairness of competition and also have acceptable reasons to support their decisions (Riding, 1994). It was believed that the more the classes meant fairer competition but poorer quality of competition.

Negotiation of classification issues among athletes, medical people, technical people and sporting politicians started after the 1988 Paralympic Games (J. Chippington, personal communication, November, 1997). In particular, a redistribution of power between athletes and medical people occurred in international disability sports. Athletes have had more power and resources to participate in the discussion of classification issues. The medically-oriented sports model had not dominated disability sports and the Paralympic movement. In addition, many of new leaders in international organisations of disability sports had sports backgrounds rather than medical ones (Sherrill, 1998). Classification in disability swimming has been socially constructed by swimmers, medical people and technical people together. In particular, most medical classifiers in disability swimming who also have sports backgrounds could understand the importance of the combination of medical and functional evaluations in disability swimming classification (Green, 1993). In simple medical evaluations it might not be practical to assign a variety of swimmers into appropriate classes.

Using the functional classification system, however, medical classifiers without sport knowledge no longer work in the classification group as authorised SAEC-SW classifiers. Their traditional authority, power and status in the classification group had been challenged directly. Some of medical classifiers tried to persuade people (e.g., swimmers) to accept and use the traditional medical classification systems (McCann, 1991). Perhaps they did not want to give up or share their power and privilege with athletes and technical people (Giddens, 1984; Sherrill, 1998). However, their efforts have not been successful. Thus, most traditional medical classifiers for classifying individual type of physical impairment of swimmers just left the classification group and lost their authority as SAEC-SW classifiers. Recently, medical classification systems have never been used in IPC sanctioned swimming championships. In international swimming championships the SAEC-SW functional classification system dominates.

According to the IPC Constitution, it is athlete-centered and the leadership of IPC should be shared with people with impairments (Sherrill, 1998). If this is applied in practices, athletes should have a right to decide what they really need in competitive disability sports and classification. Actually, most swimmers supported functional classification and the sport model although the functional classification systems still had a few problems (Hainey, 1994).

The regular revisions of functional classification systems are to resolve some problems, maintain the fairness of competition and protect the right of swimmers. The functional classification systems are not constructed to benefit or penalise any specific group of impairments of swimmers. For example, when using the 1990 functional classification system at the 1992 Paralympic Games, apparently swimmers with CP and SCI might have been penalised (Chappel, 1994). This unfair phenomenon forced SAEC-SW and its classification subcommittee to change this classification system significantly. The 1994 classification system was evaluated in this study. Some small problems have been identified but fundamental mistakes of the 1994 system have not been found. However, the results of this study contributed partially to the revision of the 1994 classification system. In particular, SB classes have been adjusted because those problems were highlighted in this study. The combination of classification research and practices in disability swimming has made the 1998 classification system more effective and less problematic (J. Buckley, personal communication, October, 1998). The successful application of this 1998 classification system could be observed at the 1998 World Disability Swimming Championships. At its conclusion of the classifier's meeting, SAEC-SW classifiers did not recognise any misclassification from about 400 swimmers. This outstanding outcome was even better than classification conducted at the 1996 Paralympic Games. The revised functional classification system has generally achieved the goal of SAEC-SW for maintenance of fair competition. Currently, SAEC-SW has supported more research to examine the 1998 classification system and some controversial issues. Although major revisions of the 1998 classification system may not occur in subsequent years, it is believed that SAEC-SW will not stop its efforts on the construction of the optimal classification system.

7.6 Classification Model

The principal aim of this study is to develop a substantive theory in disability sport classification. After the long discussion of classification research and practices, clearly classification in disability swimming is socially constructed but it is very complex. We could see that disability swimming classification is produced, reproduced or transformed by relevant social agents (Cohen, 1987; Giddens, 1984). A theoretical model constructed systematically in this study is mainly used to fit, understand, and explain the complicated social interactions among social actors in the swimming classification process.

The classification model, however, has been modified several times during the research process. This revised model is shown in Figure 7.4. It includes four essential categories. They are (a) classification as practices and interactions among members in the classification group, (b) classification as social processes, (c) main resources used by social actors in the classification process, and (d) other related factors influencing the classification process and changes of the disability swimming social system. Each category could be divided into more concepts. Those categories, concepts, and relationships between concepts could generally include an extensive view on disability swimming classification.

With respect of classification practices as social interactions, two main interactive patterns among social actors in the classification group are identified. First, swimmers interact with the classifier team which includes medical and technical classifiers. Second, a technical classifier socially interacts with a medical classifier. Although other social actors (e.g., coaches, team managers and classifier trainees) may participate in the classification interactions, their roles are not salient like classifiers or swimmers. The detailed interactions among swimmers, medical and technical classifiers were described in Chapter 4.

During the classification interactions, classification as a social process could be identified. The classification process is conceptualised into eight main features (see Section 4.5). Also several sociological concepts in this classification model have been linked. For example, power relations among social actors related to resources used by social actors. Social rules, norms and social practices constructed relied mainly on an exercise of power of social actors and allocation of rewards and sanctions by more powerful social actors in the social interactions. Concepts, such as social order, social control, routinization and social changes were also strongly related in classification. As a result, those significant concepts and their relationships in this classification model should be considered together in analysing and understanding the classification process.

In the interactive process among social actors in classification, three main resources are frequently used by social actors. In particular, SAEC-SW classifiers extensively use their sport and medical knowledge in classification evaluations and related classification practices. Conversely, most swimmers may have less classification knowledge and experience. If swimmers want to attend IPC sanctioned swimming competition, they need to follow the instructions of classifiers in the classification practices and comply with the classification rules. In addition, swimmers need to be classified by the authorised medical and technical classifiers. As a result, classifiers could dominate the classification interactions and control swimmers' behaviours and actions during the classification process.

The functional classification system is one of the most important set of rules and resources used by classifiers and swimmers in classification. Theoretically, classifiers and swimmers both have power to construct and revise the classification systems. Actually, SAEC-SW and its classification subcommittee have authority to control the changes of classification systems and have more responsibilities to maintain the fairness of competition and the social order in disability swimming. Thus, SAEC-SW has established its standard classification process and everyone in the classification group including classifiers and swimmers needs to obey it, unless SAEC-SW changes it or a new social system is constructed to replace the authority of SAEC-SW.

Although the above three main categories and concepts can explain the classification process clearly, other related factors (e.g., politics, science, sociology, ethics, history, research, culture) may directly or indirectly influence the classification process, and the changes of philosophy of classification systems and classification practices. Many of them have been mentioned briefly in the classification literature and only some of them have been discussed and examined empirically in this study. We recognised those factors to have great influences on the construction of classification processes and classification systems so that they are reserved in this model. However, further research needs doing to identify the influences of those related factors in classification. Thus, this classification model and its related concepts could be developed more completely.

In this study the classification model is constructed in one particular situation context- disability swimming classification. Thus, when this substantive theoretical model is applied to other disability sports and other situations, some problems may occur (Strauss & Corbin, 1990). This is because this classification model has not been developed as a formal theory for the application to all disability sports. Strauss and Corbin noted:

> A formal theory emerges from a study of a phenomenon examined under many different types of situations. ... The error sometimes made by researchers is that they think they can make the leap from substantive to

> formal theory because they have generalized to different types of situations from a phenomenon studied in only one situation (p. 174).

However, the development of a new classification model is a complex process. I believe that several concepts identified in this study may be starting points for future classification studies. It is suggested that researchers may examine some of concepts in great depth or modify the theory in identifying the classification process in other disability sports. Researchers may even construct other substantive theories in different disability sports and then try to develop a formal theory in disability sport classification.

The theoretical framework developed in this study may be useful for practitioners in other disability sports or members in disability sport committees to understand the complex classification process, to systematically reform existent but problematic practices and to revise their classification systems and policy. Although it is recognised that different disability sports may have different classification processes and use different classification systems, the classification model developed in disability swimming may be an important reference for practitioners and policy-makers. In addition, for athletes this classification model is easy to understand. Thus, they can understand the interactive process, realise their roles and even protect their legal rights in classification.

PRACTICES

Classifier 1

Athletic Team — **interaction** — Classifier Team — **interaction**

(Athlete, Coach,
Team Manger)

Classifier 2

SOCIAL PROCESSES

Power Relations, Allocation of Rewards, Allocation of Sanctions, Conflict, Communication, Negotiation, Cooperation, Discussion, Decision-Making, Social Control, Social Order, Social Roles, Social Rules, Social Actions, Social Changes

MAIN RESOURCES USED IN CLASSIFICATION

Sport Knowledge: movements and skills (functional abilities), functional evaluations
Medical Knowledge: physical impairments, physical evaluations
Classification Systems: regulations, procedures, criteria

RELATED FACTORS

Politics, Science, Sociology, Ethics, History, Equipment, Psychology, Economics, Culture, Research...

Figure 7.4 The Revised Classification Model for Disability Sports

7.7 Concluding Remarks

Having discussed the three fundamental elements of swimming classification-classification process, classifiers and classification system and their relationships, presented various problems in swimming classification, identified the changes of the classification system as a social process, and revised the classification model in disability swimming, it becomes very evident that swimming classification is socially constructed. In strict definition, the classification process is the social interactions among social actors in the classification group. This is a social process. In broad definition, classification can be recognised as the entire classification process which includes social interactions among social actors during the classification evaluations, the whole process changing classification systems, and the structure of the related classification practices, context and culture. When using this broad definition in research, classification is also a social process.

I have identified that the classification process is complex. However, McCann (1984) has argued that the classification process comprises only the classification procedures and evaluations. He also emphasized that classification procedures and evaluations need to be clear, scientific and reliable. His view might be right but this limited and simple view on classification process might not rouse the interest of practitioners and researchers to investigate the classification process in depth. In addition, McCann (1984, 1991) emphasized the importance of medical classification systems and medical people in disability sport classification. He has taken for granted that medical classification is always objective and right. Medical classification neglected the values of competition and decision-making by participants (e.g., athletes, coaches and sport administrators) (Craven, 1990; Lindstrom, 1986; Steadward, 1996; Strohkendl, 1996).

Changes of traditional medical-based classification were not easy and simple, but rather were the outcome of a long social, political and historical process. In particular, different arguments have been arisen from medical people, technical people, researchers, and athletes in the recent 15 years. Although the functional classification system has been developed in the late 1980s, several researchers have proved it was a faulted and unfair system (Chappel, 1994; Richter, et al., 1992). Social actors in the disability swimming social system (e.g., classifiers and swimmers) transformed the system and classification practices to meet their specific needs. The revised system, the features of SAEC-SW classifiers, and the classification process have been examined in this study. Although a few problems in the classification system and process have been identified, generally the reproduction and transformation of the social system are regarded as successful. In particular, most social agents in the classification group support SAEC-SW to use its classification system in classification practices. Three specific values are pointed out here.

First, technical people and athletes have more power to decide their sports and classification. In particular, they participate in the construction and revision of classification systems and practices more actively. The domination of medical people in disability sports has been diminished. Second, athletes expect fair but high-level competition under the application of integrated classification systems in actual practices. Third, the social structure and social system can be maintained appropriately. Swimmers may concentrate on competition not classification. Fairness of competition is controlled by competent classifiers. Social disorder in the social system and conflicts among social actors show signs of continuing decline.

Even if the swimming classification systems and processes have been improved tremendously, construction of classification will be carried out continuously by related social actors. Systematic and critical classification research will be one of the most important sources for SAEC-SW to tackle problematic issues in the classification system and process. In particular, research from different perspectives on the examination of the complexity of classification process will be stimulated.

The classification model for disability swimming developed in this study is a useful framework for researchers and practitioners to understand the classification process and establish basic concepts in classification. Researchers may examine some classification concepts in greater depth. Practitioners may use the model to adjust their classification practices. SAEC-SW and policy-makers may use it to monitor the outcomes of classification and identify potential problems in actual classification practices. Thus, this model may have its appropriate function and this study may make real contributions to the disability sport social world and practices.

CHAPTER 8

CONCLUSIONS AND IMPLICATIONS OF CLASSIFICATION STUDY

8.1 Summary and Conclusion

Classification is crucial in disability sports. Although the concept of classification has been used in disability sports over 50 years, this topic has not been examined systematically. The principal objective of this thesis has been to develop a classification model in disability sports in order to explain the complexity of the classification process. Using Giddens's structuration theory (1984) as a starting point, rules and resources in the disability swimming social system were adopted as the theoretical framework for this study. After the classification literature was extensively reviewed, three fundamental elements- the classification process, classifiers, and the classification system in disability sport classification were particularly recognised. However, there have been no empirical studies to investigate them together in great depth. In this project, disability swimming classification was selected as an example for further investigation. The swimming classification process, the features of SAEC-SW classifiers, and the outcomes of the functional classification system were examined in Chapters 4, 5 and 6, respectively. These three empirical studies are summarised again in this section because clarification of these three elements in classification is very essential.

Using the methods of participant observation and interview, the classification process in disability swimming was identified as a social process. Social actors (e.g., medical classifiers, technical classifiers, swimmers, coaches and classifier trainees) in the classification group socially interacted. After the long-term observation in different swimming classification settings, the complex classification process in disability swimming can be divided into nine procedures. They are (a) registration for classification and introductions among social actors, (b) bench test and physical evaluations, (c) water test and functional evaluations, (d) discussion among members of the classifier team, (e) explanation of classification results, (f) classification appeal, (g) observation during the competition, (h) classification protest, and (i) meetings of classifiers. Social actors need to understand related practices and interactions in each procedure. Thus, classification can run smoothly and outcomes of classification may be satisfactory.

When the complex classification process was analysed, eight features in the classification process were identified. First, classification is the interactions among social actors. Second, routinization in the classification process is the basic structure for maintenance of the social practices and the social system. Third, social rules are developed by social actors to control their behaviours and to produce or transform the classification practices and interactions. Fourth, SAEC-SW classifiers use several types of resources in the social practices so that they have the authority and more power to handle the classification process and decide classes for swimmers. Fifth, different power relations among social actors occur in the classification process. Obviously, SAEC-SW classifiers exercise their power in most classification procedures and dominate interactive processes. Six, rewards and sanctions are allocated to promote conformity and prevent deviance in the classification group. Seven, social actors need to play expected roles in the classification process. Eight, conflicts among social actors in the classification interactions may happen. Conflicts may affect the interactions among social actors, the quality of classification, and even social order in the social system, but they may also facilitate the reproduction and transformation of the interactive process and social practices.

With respect to the classification interactions, Craven (1990) argued that the classification process should be controlled by classifiers and athletes together. Athletes should have a right to understand their classes and related classification procedures.

Strohkendl (1986) claimed that the active participation of players in wheelchair basketball classification may reduce occurrence of misclassification and conflicts among classifiers and players. Sharing power among classifiers and players in wheelchair basketball classification is promoted. However, SAEC-SW has developed its own classification system and process in order to fulfill its needs. Specifically, the detailed classification rules have been recorded in the SAEC-SW classification manual so that classifiers and swimmers are able to comply with them during the classification process. Gradually, SAEC-SW and its classifiers can organise the classification process more consistently although swimmers may not play an active role in the interactive process. This demonstrates that SAEC-SW has formed its classification culture successfully. SAEC-SW classifiers have played their roles appropriately and have established the authority to control the classification process well. As a result, the social order in the disability swimming social system can be maintained steadily.

It is also recognised that SAEC-SW classifiers play an important role in disability swimming. They are the main social agents to maintain social order and stability in disability swimming classification and also control fairness in competition. It is assumed that the features of SAEC-SW classifiers apparently affect their roles. Using the methods of survey and participant observation in this study, (a) resources used by SAEC-SW medical and technical classifiers to maintain and transform the SAEC-SW system of authority were examined and (b) socialization of classifiers as agents of social control in disability swimming were explored. Specifically, seven features of SAEC-SW classifiers were identified in this study. They are, (a) using a common language (i.e., English) for communication with other social actors in classification interactions, (b) having an educational background and a qualification in medicine, physiotherapy, physical education or coaching, (c) having a teaching or coaching qualification in swimming, (d) having a lot of practical experience in classification, (e) having swimming experience, (f) having medical knowledge and (g) having swimming knowledge. Although SAEC-SW medical and technical classifiers may have some variation in terms of those features, they draw on four main resources- classification knowledge, professional knowledge, classification experience and sport experience to play their roles properly.

In addition, the authority of SAEC-SW classifiers is strengthened in several ways which classifiers are socialized as agents of social control. First, an apprenticeship system has been designed by SAEC-SW to ensure the maintenance of standards of applicants. Second, the long-term participation in the actual classification setting has been recommended for trainees to learn the classification culture and understand the social interactions in the classification group. Third, some significant agencies or agents (e.g., swimmers, coaches, reading the classification manual, attending classification seminars) may help classifiers or trainees to learn the social roles. Fourth, regular and frequent discussions among classifiers have given a transformative capacity to the role of classifiers. As a result, SAEC-SW classifiers may have more consistent views to play their roles and conduct classifications. Most importantly, an identification of the features and roles of SAEC-SW classifiers and an understanding of socialization of classifiers in this study may be useful for SAEC-SW to develop the appropriate training programmes for people who want to become medical or technical classifiers.

Apparently, evaluations of the effectiveness of the functional classification system are also important in the classification research. If a swimming classification system is fair, theoretically, performances across classes should be different; elite swimmers in the same class should demonstrate similar performances; and elite swimmers with different types of physical impairments should have equal opportunities to advance to the finals and win medals. To identify the outcomes of swimming classification, an analysis of performances and types of physical impairments of swimmers at the 1996 Paralympic Games was undertaken. Results of this study revealed that the functional classification system was in general fair. However, a few anomalies in some SB classes have been pointed out. It is suggested that SAEC-SW and its classifiers need to fine-tune the 1994 classification system. Similar performance and impairment approaches in the evaluation of the revised classification system (i.e., 1998 classification system) need to continue.

Having identified the elements of the classification process, SAEC-SW classifiers and the classification system in disability swimming, more complete and clear views in swimming classification can be established. It is concluded that classification is socially constructed. More importantly, the results of those three empirical studies and knowledge constructed in previous classification literature help us to develop a classification model which is used to understand and explain the complexity of classification in disability swimming. This substantive model consists of four fundamental categories (see Figure 7.4). First, the interactive patterns among social actors in the classification process are illustrated. Second, the classification process is a social process. Third, three main resources are used by classifiers to conduct classification and construct related classification practices. Fourth, other related factors affect the changes of the classification process and the classification system and the structure of the disability sport social system. Each category can also be divided into more concepts. Many concepts and the relationships of concepts have been examined empirically and discussed in depth, but some have only been mentioned briefly and superficially in this study. Thus, further research is recommended for clarification of categories and concepts that have not been investigated in this study. As a result of more research, I believe that the classification model in disability sports can be developed more completely and also be applied usefully and extensively to other sports.

8.2 Implications

This thesis has systematically examined several classification issues. I suggest that the results and concepts of this study can be used in disability swimming. Most of them have potential for use in classification of other disability sports, but perhaps some of the ideas need to be modified before they are actually used in practices or research. The implications of this study can be divided into seven major points.

First, the classification model developed in this study may be used to partially or completely explain the complex classification process in other disability sports. Thus, athletes, classifiers and researchers may establish a clearer view to understand classification. Although there are some diversities among different disability sports, practitioners and researchers may use the classification model as a starting framework to investigate more classification issues or clarify more concepts in great depth. Gradually, the construction, revision and transformation of classification in disability sports may be based on actual practices and results of research studies. As a result, many controversial problems in disability sport classification may be tackled scientifically and the substantive theory in this study may be fully developed into a formal theory.

Second, the classification process in different disability sports needs to be clarified, analysed and interpreted. As McCann, Davis and Richter (1994) and Williamson (1997) noted, classification procedures need to be clearly reported in the classification manual because many people (e.g., athletes, coaches and researchers) are eager to know how athletes are classified fairly. In this study the swimming classification process has been described in great detail. In particular, the flow diagram (see Figure 4.1) has been developed to represent the complex classification process in disability swimming and also connect each procedure. Thus, athletes, coaches, classifiers, classifier trainees and researchers can easily understand the entire classification procedures. Other disability sports may adopt this idea to identify their own classification procedures and complete a similar flow diagram to show the continuous classification process. In addition, an interpretation of the interactive process among social actors in classification is helpful to understand potential problems in the classification process and to develop and revise classification rules. Some negative interactions such as social conflicts, social dislocation or disorder, may be avoided if the entire classification process can be identified clearly and allow problematic processes to be improved effectively.

Third, disability sport committees may need to identify the features of their own classifiers. Thus, we can appreciate the competency of classifiers and ensure the quality of classification. In this study it has been recognised that SAEC-SW classifiers have a lot of specific features and how they are socialized to play their roles in the classification group. Perhaps different sport committees need different features of classifiers to conduct the work of classification fairly and appropriately. To fulfill this goal, it is assumed that different sport committees need to design different training programmes and have different evaluative criteria for their own classifiers. To examine these questions, it is suggested that the questionnaire used for identification of the features of the SAEC-SW classifiers and several sociological concepts used in this study may be applied again. However, some modifications may be necessary. As a result of more research studies, the roles of classifiers in other disability sports can be examined empirically and evaluated systematically, and even features and roles of classifiers in different disability sports can be compared.

Fourth, an analysis of classification outcomes may also be used in other disability sports so that the effectiveness of the classification systems can be examined scientifically and objectively. In particular, the performance and impairment approaches which have been demonstrated in this study are useful for actual application in the research of classification outcomes. For example, Wu (1998) used the same idea to evaluate the effectiveness of the functional classification system in table tennis. He stated the same theory "the higher the table tennis classes, the better the performance" and used it for the examination of the actual performance at the 1996 Paralympic Games. However, the results of his empirical study revealed that a lot of players in lower classes performed better than players in higher classes. Thus, his study has shown that the functional classification system in table tennis has a lot of problems with respect to the fairness of competition. As a result of this crucial finding, the International Table Tennis Committee for the Disabled recognises the validity and contribution of this kind of research and also understands the problems in the table tennis classification system. The International Table Tennis Committee for the Disabled is planning to revise the current table tennis classification system. However, it will be more appropriate that *longitudinal* evaluations of the classification system in different international championships (e.g., Paralympic Games, World Championships, European Championships) are conducted and results in those studies need to be compared, before a conclusion is reached for the improvement of the classification system. After all, changes of the classification systems need to be undertaken carefully.

Fifth, the methods of natural inquiry are very useful in classification research. However, they have often been neglected in the previous classification studies. This study has demonstrated that the researcher participated in actual classification settings to learn the culture of the classification group and observe and interview insiders of the group to understand the social context. In addition, other research methods (e.g., survey and document analysis) were used to complement natural inquiry in this study. Choosing appropriate methods for collection of data to answer the research questions is one of the most important features in this study. I suggest that future studies follow the methods of this study for further investigation in disability sport classification. Conducting classification research should not be limited only to the laboratory because this may not be very practical and useful (Strohkendl, 1996).

Sixth, it is also important that multiple perspectives (e.g., political, historical, physiological, biomechanical, psychological, ethical and administrative perspectives) are used in the studies of disability sport classification. For policy makers, developing and revising classification systems and rules rely on three main resources- their practical experience, classification research (i.e., published articles, conference proceedings, and specific classification reports), and discussions among social actors. If researchers use several perspectives to examine disability sport classification, more complete views in construction of classification can be established. As a result, rule-makers can have more confidence in developing fair classification systems and consequently less changes to the classification rules. Although the combination of the different perspectives in classification studies is important and will be a future trend, more cooperation among researchers in different academic fields and different countries needs to be encouraged and coordinated (Reid & Prupas, 1998; Vanlandewijck & Chappel, 1996).

Seven, this study has identified a few problems in the classification process, socialization of SAEC-SW classifiers, and the functional classification system in disability swimming (see Chapters 4, 5, 6 and 7). SAEC-SW may need to take those problems into account seriously because they may affect the quality of classification, the fairness of competition, and classification interactions among social actors. Some problems may even affect the authority of SAEC-SW and the social order in the disability swimming social system. Most importantly, being a researcher in classification and also an authorised classifier in disability swimming, this study has demonstrated how research and actual practices may be combined together. I hope this study can help SAEC-SW and its classification subcommittee to think about some classification issues entirely, tackle some problems and revise classification rules more scientifically, and also contribute to the maintenance of the fairness of competition and the facilitation of more classification studies in disability swimming.

8.3 Limitations

Although a classification model in disability sport was developed, also the classification process in disability swimming, the features of SAEC-SW classifiers and the outcomes of the functional classification system were examined in this project, there are several limitations to this study.

First, in the identification of the classification process more classifiers' perspectives were used. Consequently, the swimmers' perspectives have been apparently neglected because only a few swimmers were interviewed in this study. It is realised that this uneven view may affect the application of this study. In future studies researchers may need to interview more swimmers to understand their points of view on the classification process and classification systems and try to fill in the gap of this study. Because social actors produce and transform social practices and swimmers are important social actors in the classification group, the identification of swimmers' perspectives may help us clarify more concepts in the classification practices. Perhaps the classification process in disability swimming can be understood in full perspective.

Second, an identification and interpretation of the classification process relied mainly on the self-reflection of the researcher in this study. Although the triangulated inquiry has been applied in this study, the researcher's perspective and subjectivity may produce some prejudice.

Third, collection of empirical data in this study may be restricted. The main reason was that the researcher needed to get permission from the coordinators of the national and international championships in order to participate in classification activities legally and officially. In addition, a lot of data (e.g., types of impairments of swimmers) collected in this study were confidential. Therefore, the researcher needed to establish good relationships with the chairperson and senior classifiers of SAEC-SW and coordinators of swimming championships and also write a formal proposal to SAEC-SW Sport Science Subcommittee in order to collect this confidential data. Most importantly, the researcher needed to make real contributions to SAEC-SW, such as clarification of some issues for SAEC-SW, providing results of research for the revision of the classification system and participating in the regular discussion among SAEC-SW classifiers. If the researcher did not know those important people in SAEC-SW and carry out some practical studies, it would have been very difficult to collect a lot of swimmers' data and receive questionnaires back from most classifiers. As a result, three empirical studies in this project might not have been finished appropriately.

Fourth, recording the data of observation and interview was also a likely problem in this study. Generally speaking, the researcher did not interfere with regular classification interactions among the social actors or exert any pressure on classifiers and swimmers because a discreet position was adopted by the researcher. Thus, the modern machines (e.g., a video recorder and a tape recorder) have not been used for data collection. Conversely, the researcher used the traditional method- making notes and diary to record data. Using this method, some data may have been missed out and some meanings may be interpreted more subjectively.

Fifth, when examining the classification outcomes, some factors have not been analysed in this study. I recognise that the relationships between performance and classification may be influenced by a lot of factors such as coaching, swimmers' techniques, physical conditions and ages. In this study, it is impossible to explain the effects of those factors in swimming classification. In future studies more research approaches are needed in the examination of performance outcomes and related factors.

Six, some concepts in the classification model which was developed in this study have not been fully examined. Researchers and practitioners need to recognise the weaknesses of this classification model when they intend to use it in disability sports. In particular, the development of this model is mainly from the sociological perspective in swimming classification settings.

8.4 Concluding Remarks

Classification in disability sports is a complicated topic. This study has demonstrated the use of systematic research methods to clarify some controversial issues as well as develop useful concepts and a classification model for actual applications and further research. In addition, this study highlights the importance of multiple views to examine the classification process, classifiers and outcomes of the classification system together. However, it was impossible for this study to examine and discuss all the controversial issues listed in Section 2.9 and resolve them.

In closing, I hope this study is a starting point for stimulation of the further research in disability sport classification. Gradually, other controversial issues in classification may be tackled by the combination of research and practical experience of social actors (e.g., classifiers and athletes). As Vanlandewijck and Chappel (1996) emphasised in their article:

> One must realize that the perfect classification does not exist. The optimal classification system however, does exist, but from a scientific viewpoint researchers are running far behind, because of the rapidly evolving world of sports for athletes with a disability (p. 82).

We all expect more effort needs to be put into the classification research so that the classification systems and processes can be improved. If this action is continuous, we believe that the *optimal* classification systems will be developed successfully, evaluated scientifically, and used practically in all disability sports one day!

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Appendix A: A Letter to International Swimming Classifiers

Dear Classifier

I am writing this letter to you to ask for your cooperation. My name is Sheng Wu. I am a swimming classifier trainee. In addition, I am a PhD student in the Department of Physical Education and Sports Science at Loughborough University, England. The focus of my doctoral thesis is classification and disability sports. In particular, I am very interested in classification as a social process and one of the most important features of it.

To examine this feature I am asking you to complete the attached **International Survey of Swimming Classifiers**. As one of a few international swimming classifiers, your response is very important and can help us to understand what is required of classifiers. We are particularly concerned to make recommendations for standardised training programmes in the development of new and established classifiers.

Your personal responses will be stored on computer disk and so they are subject to the Data Protection Act. By law they must be treated in the strictest confidence. This means that you may have access to your information but to no-one else's. In addition, you should know that **your name will never be given out.**

Thank you for your cooperation.

Sheng Wu
PhD student in disability sports

Appendix B: International Survey of Swimming Classifiers

Strictly Confidential!

Thank you for agreeing to take part in this survey. Your response is greatly appreciated and will be treated in the strictest confidence. Your data will be stored on a computer and is subject to the Data Protection Act of the United Kingdom. This means that you may have access to your information but to no-one else's. In addition, you should know that **your name will never be given out.**

Please tick (✓) the appropriate boxes ❑, or write your answer in the spaces provided. Thank you for your cooperation.

A. Personal Details

1. Name ____________________

2. Are you

   ❑ female ❑ male

3. What is your age? __________ years old

4. What is your country of residence? ____________________

5. What languages can you speak?

   First Language ____________________

   Second Language ____________________

   Third Language ____________________

   Others ____________________

6. Do you have any physical impairments? ❑ Yes ❑ No

7. If your answered Yes to question 6,

   (1). what kind of physical impairments do you have? ____________________

   (2). are you or have you ever been an athlete with a disability?

   ❑ Yes ❑ No

   (3). If Yes to (2), what was/is the highest level of competition?

   ❑ Local level ❑ Regional level

   ❑ National level ❑ International level

8. What is your highest education and achievement?

Degree	Subject and Field
____________________	________________________

9. What is your current occupation?________________________

10. How long have you worked in your current occupation? __________ years

11. Have you ever undergone any special training or courses about disability sports before you were involved in swimming classification?

☐ Yes ☐ No

B. Swimming Classifier Details

12. You are a

☐ technical classifier ☐ medical classifier

13. Please describe how you came to be a swimming FCS classifier?

____

____

____

____

____

14. Do you have any swimming coaching certificate?

☐ Yes ☐ No

15. If you answer Yes to question 14, at what level do you coach at present?

☐ Local level ☐ Regional level

☐ National level ☐ International level

☐ Other (please specify ____________________)

16. How long have you had the swimming coaching certificate? ________ years

17. Do you have a swimming teaching certificate?

    ❑ Yes ❑ No

18. If you answer Yes to question 17, how long have you had the swimming teaching certificate? ____________years

19. When was your first opportunity to act as a swimming FCS classifier at the **National Games in your own country?**

    in 19________

20. When was your first opportunity to act as a swimming FCS classifier at an **International Games?**

    in 19________

21. How long have you been an authorized international swimming FCS classifier?

    ____________________years

22. Before the functional classification system was used in swimming in 1989, were you an international swimming classifier?

    ❑ Yes ❑ No

23. If you answered Yes to question 22, what classification system did you use to classify swimmers?

    ❑ ISMWSF ❑ CP-ISRA

    ❑ ISOD ❑ Other (please specify ________________________)

24. Did you participate in swimming competitions before you were a classifier?

    ❑ Yes ❑ No

25. If you answered Yes to question 24, at what level did you swim and compete?

    ❑ Recreation ❑ Local

    ❑ Regional ❑ National

    ❑ International ❑ Other (please specify________________________)

26. About how many swimmers do you think you have classified since the functional classification system has been used in swimming (including the National and International Games)?

❑ below 100 ❑ 101-200 ❑ 201-300

❑ 301-400 ❑ 401-500 ❑ above 500

27. Why did you want to be an international swimming FCS classifier? (please write)

____

____

____

____

28. Do you regularly classify swimmers in your national or local swimming competitions?

❑ Yes ❑ No

29. Do you regularly observe and participate in the practices and training sessions of your local swimming team for swimmers with physical impairments?

❑ Yes ❑ No

30. How did you learn swimming classification? (tick those which apply)

❑ go to swimming competitions to learn classification

❑ attend swimming classification seminars or workshops

❑ read the classification manual

❑ discuss with other classifiers

❑ learn from swimmers

❑ learn from coaches

❑ other (please specify ____________________________)

31. How did you learn swimming knowledge? (tick those which apply)

- ☐ go to swimming competitions to learn it
- ☐ attend swimming coaching seminars or workshops
- ☐ attend swimming training camp
- ☐ discuss with other classifiers
- ☐ learn from swimmers
- ☐ learn from swimming coaches
- ☐ read swimming books and articles
- ☐ other (please specify ______________________________)

32. How well do you understand the following medical knowledge used in swimming classification?

	very well	good	satisfactory	poor	very unsure
1. characteristics of physical impairments	☐	☐	☐	☐	☐
2. diagnosis of specific impairments	☐	☐	☐	☐	☐
3. the purposes and meanings of physical evaluations	☐	☐	☐	☐	☐
4. choosing appropriate physical evaluations for swimmers	☐	☐	☐	☐	☐
5. performing physical evaluations and bench tests	☐	☐	☐	☐	☐
6. medical terms used in classification	☐	☐	☐	☐	☐
7. the limitations of physical abilities in specific impairments	☐	☐	☐	☐	☐

8. Can you think of any other medical knowledge you need for swimming classification (please specify ______________________________

____

____

______________________________)

33. How well do you understand the following sports knowledge used in swimming classification?

	very well	good	satisfactory	poor	very unsure
1. swimming skills	☐	☐	☐	☐	☐
2. distinguishing the movement quality of swimmers' skills	☐	☐	☐	☐	☐
3. predicting swimmers' potential abilities and functions	☐	☐	☐	☐	☐
4. guiding swimmers to perform different swimming skills	☐	☐	☐	☐	☐
5. swimmers' technical problems	☐	☐	☐	☐	☐
6. analysing movement patterns of swimmers with specific impairments	☐	☐	☐	☐	☐
7. distinguishing the differences of swimmers' abilities between classes	☐	☐	☐	☐	☐
8. suggestions to compensate swimmer's technical problems	☐	☐	☐	☐	☐

9. Can you think of any other sports knowledge you need for swimming classification (please specify ______________________________

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______________________________)

Thank you very much for your cooperation. Please return the questionnaire to the Department of PE and Sports Science at Loughborough University in the envelope provided. You do not need to affix any stamps. We have prepaid the post mail.

Appendix C

Ideas for Data Collection in Observation and Interview

C.1 Starting Questions:

- What is classification in disability sports?
- What does classification mean?
- Why is classification important?
- Who is going to conduct classification?
- When is classification conducted?
- Where is classification conducted?
- How is classification conducted?

C.2 Choosing Disability Swimming as the Main Sample:

- What is classification in disability swimming?
- Why is classification in disability swimming important?
- Who is going to conduct classification in disability swimming?
- When is classification in disability swimming conducted?
- Where is classification in disability swimming conducted?
- How is classification in disability swimming conducted?

C.3 More Questions Raised:

- What are the most important elements in disability swimming classification?
- How do classifiers interact with swimmers during the classification process?
- What do classifiers conduct for classification?
- Why do classifiers conduct those actions?
- When do classifiers conduct those actions?
- Where do classifiers conduct those actions?

C.4 More Detailed Questions Need to be Clarified:

- Why can classifiers conduct classification evaluations?
- What central roles do classifiers and swimmers play in classification?
- How do the classification processes in disability swimming controlled well?
- What are routine actions in disability swimming classification?
- In what situations, classification has problems?
- When classification has problems, how do classifiers and swimmers sort out problems?
- What strategies do classifiers and swimmers develop to sort out problems?

C.5 More Questions Developed to Understand the Entire Classification Process:

- What resources are used by classifiers during the classification process?
- What rules are used in disability swimming classification?
- What is a successful classification?
- What is a problematic classification?
- If some classification actions often have problems, should classification need to be changed?

- What changes occur in disability swimming classification?
- How is classification changed?
- Who has power to change disability swimming classification?
- Why are some actions changed not all?

C.6 Some Related Questions in Disability Swimming Classification:

- What problems in current classification?
- How problems in classification are sorted out?
- Who have power and abilities to sort out problems?
- Why some problems cannot be sorted out?
- What kind of research is needed in disability swimming classification?
- Who is going to conduct research in disability swimming classification?

Appendix D Analysis of Qualitative Data

D.1 Procedures for Analysis of Data

1. Make detailed fieldnotes after each observation and interview

2. Repeatedly read the fieldnotes and diary notes, and make comments and ask more questions

3. Make codes in the fieldnotes (i.e., coding)

4. Find the main patterns in the classification process

5. Find main concepts from the notes

6. Find higher level categories from the notes

7. Go back to the classification areas to collect more data by observation and interview

8. Develop more concepts and revise concepts and categories by comparisons of notes and situations (e.g., social contexts)

9. Go back to the classification areas to collect more data by observation and interview

10. Find more examples to link categories and concepts

11. Go back to the classification areas to collect more data by observation and interview

12. Draw the diagrams to connect the relationships among concepts and categories

13. Stop collection of data when no more concepts and categories are identified

D.2 Related Concepts Developed in the Analysis of Qualitative Data

Resources used by social actors

Power relations

Rules

Social process

Social interaction

Routine actions

Conflicts

Socialization

Social changes

Social order

Social system

Allocation of rewards and sanction

Roles (e.g., social actors: classifiers and swimmers)