# Effects of workgroup identification on cooperative behaviour in construction projects

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# Effects of Workgroup Identification on Cooperative Behaviour in Projects

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**ABSTRACT**

Research suggests that social identities and processes of identification are central to effective construction management practice. Yet, there is a paucity of construction management research that investigates the substantive relevance of social identification. To redress this gap, a superordinate multidimensional 'cause' model for workgroup identification (with three reflective dimensions: cognitive identification, pride, and respect) was tested for its effects on individuals' in-role, extra-role, compliance, and deference behaviour. This was undertaken with a survey sample of 381 construction managers in the UK, and using maximum likelihood structural equation modelling. The results show that workgroup identification predicts all four dimensions of cooperation. The results also suggest that workgroup identification s better modelled as a superordinate construct than by its dimensions as a related bundle. Construction managers need to give serious construction to the management of processes of identification in the work place.

**Keywords**: cooperation, temporary multi-organisation, TMO, workgroup identification.

## 1.  INTRODUCTION

People's connection to a role, group or organisation is both purposive, in terms of how experiences and activities associated with the social collective create a feeling of being responsible for some socially valued outcomes or of being part of something greater than themselves (Ashforth *et al.*, 2008) and expressive, in terms those experiences and activities define or shape the definition of the self (Kane, 1998). Over time, people come to develop a deep-seated identification with social collectives that enhance their sense of collective self-esteem and that espouse values that are congruent with or similar to their own personal values (Ashforth *et al.*, 2008). However, because there many circles of inclusivity in work settings (both nested and crosscutting), people usually develop multiple social identities, one or more of which mat be salient at any one time (Gaertner *et al.*, 1993; Haslam and Ellemers, 2005). When salient, identification with a collective is considered to be a strong motivational force that has a natural connection to valued collective-level outcomes (Albert *et al.*, 2000).

However, there is no unified agreement on what identification is as an entity or entails as a process. Edwards (2005) provided a comprehensive review of various conceptualizations and operationalisations of organisational identification, which depicts a very broad construct with numerous and overlapping sub-concepts or dimensions. The most influential approach to organisational identification, by far, is that according to the social identity theory (Tajfel and Turner, 1979; Tajfel, 1982). The main thrust of social identity theory is that an individual's self-concept comprises a personal identity which is unique to the individual, and a number of social identities which are shared with other members of the groups or categories to which the individual assigns himself or herself (or is assigned by others). Tajfel (1982:2) defined social identification as a process (and emergent state) involving three interrelated yet distinct components: "a cognitive one, in the sense of awareness of membership; [...] an evaluative one, in the sense that this awareness is related to some value connotations; [and] an emotional investment in the awareness and evaluations". According to Tajfel (1982), the first two (i.e. cognitive and evaluative) components are essential, whilst the third (i.e. affective) component is a necessary consequence of the first two components.

However, researchers in this approach have used various conceptualisations of social identification, some (e.g. Mael and Ashforth, 1992) focusing narrowly on the cognitive component and others (e.g. van Dick *et al.*, 2004), broadening the construct beyond its cognitive, evaluative and affective components to also include a conative component, involving behavioural intentions and actual behaviours. These broader conceptualisations, however, create a significant an overlap between social identification and other constructs, notably commitment; this has generated considerable debate in the extant literature (cf. Edwards, 2005). For example, Allen and Meyer's (1990:1) famous three-dimensional attitudinal commitment model conceptualises affective component "employees' emotional attachment to, identification with, and involvement in the organisation". However, a consensus seems to be emerging which considers social identification and commitment to be related but distinct constructs, with social identification, in contrast to commitment, having behaviour or behavioural intentions only as probabilistic outcomes, requiring an altering of the individual's self-concept to incorporate characteristics (e.g. values) of the collective, limited in terms of foci of attachment to only social collectives (Meyer *et al.*, 2006; Ashforth *et al.*, 2008). Further, social identification may actually foster commitment (Meyer *et al.*, 2006).

These recent contributions to the social identification–commitment debate provide conceptual clarity to and support for the social identification construct, and the recent meta-analysis by Riketta (2005) also provided empirical support for the substantive and discriminant validity of social identification. However, questions still remain about the precise factor structure of social identification, with researchers still variously conceptualising social identification as a two-dimensional (e.g. Olkkonen and Lipponen, 2006; Walumbwa *et al.*, 2009; Johnson *et al.*, 2012), and three-dimensional (e.g. Edwards and Peccei, 2007; Blader and Tyler, 2009; Christian *et al.*, 2012) construct. Also, in empirical analyses, researchers have variously represented social identification by a linear composite scale (e.g. Olkkonen and Lipponen, 2006; Walumbwa *et al.*, 2009; Edwards and Peccei, 2010), its dimensions as a set (e.g. Boroş *et al.*, 2011; Johnson *et al.*, 2012), or a superordinate multidimensional construct with its dimensions as reflective indicators (e.g. Blader and Tyler, 2009; Christian *et al.*, 2012); it is not clear which one of these three approaches is the best way to model social identification.

Within construction management research, the notion of social identification seems conceptually relevant given the ubiquity of, what are essentially self-managing, cross-functional workgroups both within and across organisational boundaries (i.e. in TMOs) in construction production. Indeed, previous construction management research already points to this. For example, Gluch's (2009) applied a "practice lens perspective" (p.965) to analyse the role and identity of an environmental professional, and found that, in order to perform their roles creditably, environmental professionals need to "develop alternative identities to adapt to the different situations that they find themselves in, i.e. formal roles in accordance with their job description and informal roles to suit different project practices" (p.959). While Gluch's (2009) research does not even cite social identity theory, it nonetheless provides a powerful depiction of identity work in relation to identification with a role (i.e. "environmentalist") and a social collective (i.e. "project organisation"): the notion of salient dual identities – "the somewhat ambiguous position of being both generalist and specialist" (p.964) – is true of all specialisms involved in construction, and consistent with the conceptualization of social identity (Haslam and Ellemers, 2005); the use of narratives, storytelling, and facilitation of meaning-making processes, consistent with the sensebreaking, sensegiving and sensemaking processes integral to identity construction (for a detailed account of these processes, cf. Ashforth *et al.*, 2008). Recently, Brown and Phua (2011) made an important contribution to the lines of social identity literature in construction management research by showing how identity concerns frame and shape key aspects of construction management practice – professionalism, ethics, relationships, competence, knowledge, tools, national cultural context – that have the most direct and proximal link to performance. Identity, they argue, "is, fundamentally, a performance issue. It is the necessary point of origin for investigations of what makes one construction manager successful in the performance of his or her tasks and another less so" (p.84). However, there is a paucity of construction management research that has investigated the substantive relevance of the social identification construct to construction. Phua's (2004) study is, to date, the first and only construction management study to show that the development of deep-seated superordinate identification with a TMO project workgroup is a viable prospect. Phua (2004) found that

individuals high in cognitive identification exhibited more extra-role behaviour in their nested and crosscutting (i.e. TMO) workgroups. Clearly, one study is not enough, plus there have been significant changes (as described above) in the conceptualisation and operationalisation of social identification since Phua's study.

The purpose of this study was two-fold: first, to bolster evidence of the substantive relevance of the social identification construct to the construction management discipline by empirically testing the effects of a three-dimensional superordinate workgroup identification construct on all four dimensions of individuals' cooperation with their proximal TMO workgroups: in-role, extra-role, compliance, and deference behaviour; and second, to contribute to the ongoing debate in the mainstream management literature about the utility of the multidimensional superordinate 'cause' model for group identification. As noted above, Tajfel's (1982) seminal conceptualisation of social identification identified two essential dimensions, a cognitive component (i.e. self-definition in terms of group membership) and an evaluative component (i.e. value connotations of group membership). However, there are various formulations of the evaluative component (and consequential emotional reactions) in the extant literature. The particular formulation followed in the present study is the self-enhancement explanation of social identity. This approach posits that people seek, through group membership, to create, maintain and project a positive sense of collective self-esteem (Tyler and Blader, 2003; Ashforth *et al.*, 2008; Blader and Tyler, 2009). This self-enhancement motive is considered to have two components (Ashforth *et al.*, 2008:335): "experiencing an identity in a positive manner and experiencing growth to becoming a truer exemplar of a valued identity". Tyler and Blader (2003) stated the evaluations relevant to the two experiences in the context of a workgroup as a positive evaluation of the status of the workgroup (evoking *pride*), and a positive evaluation of one's own status *within* the workgroup (evoking *respect*). Thus, workgroup identification is represented in this study as a multidimensional construct with cognitive identification (hereafter, identification), pride, and respect as dimensions. To address the study purposes, four hypotheses linking workgroup identification and each dimension of individuals' cooperation with the workgroup were formulated and tested. The conceptualisation of workgroup identification, and the meta-analysis by Riketta (2005) suggest that these hypotheses are tenable. Specifically, one or more the three dimensions of workgroup identification (i.e. identification, pride, and respect) has been shown have a significant influence on in-role (e.g. van Knippenberg, 2000), extra-role (e.g. Bergami and Bagozzi, 2000; Dukerich *et al.*, 2002; Blader and Tyler, 2009; Johnson *et al.*, 2012), compliance, and deference (e.g. Tyler and Blader, 2001) behaviour. Thus, formally:

- *Workgroup identification will have a significant and positive influence on in-role behaviour ($H_1$), extra-role behaviour ($H_2$), compliance behaviour ($H_3$), and deference behaviour ($H_4$).*

## 2. METHOD

### 2.1 Sample and procedure

The questionnaire responses analyzed were from 381 chartered built environment professional managers in the UK. Average age of the participants was 50 years. Average total experience of the participants in construction was 30 years and average experience in current position was 11 years. All participants held managerial positions in the projects on which they reported, and all but 55 of them had at least a bachelor's degree. Of those who disclosed their ethnic background, 362 were Caucasian, eight were Asian, and eight were African. This sample included 366 men and 15 women.

Items for this Study 1 were merged into a larger questionnaire instrument, which itself was a conceptual replication of an earlier Hong Kong based study (see Anvuur, 2008). A focus group discussion involving senior academic colleagues was used to make further refinements to the broader questionnaire instrument to make it more appropriate to the UK context. See Appendix for items. Data collection was undertaken between July and September 2010. The aim was to survey built environment professional managers in the UK who have recent project experience. As the theoretical population was unknown, a study population was defined using

the accessible and contactable population of chartered UK-based built environment professionals in professional membership directories with 'project management' or 'managing construction' as a specialism. This resulted in a sampling frame of 4290 professionals. 2000 of these were randomly selected and invited to participate in the study. To ensure that only those with recent project experience (the 'eligibles'), a screening question and skip routine were used to identify and direct to the demographic/social preference questions respondents who had no direct involvement in a construction project between and including 2005 and 2010 (the 'non-eligibles'). The questionnaire items (save socio-demographic items) were tailored to a project context by expressly asking respondents to focus on their proximal TMO work group within one and the same specific project.

Some 441 of those invited to participate in the study had email addresses and were emailed the link to a web version of the questionnaire, which granted customized content and anonymity. The rest received the postal questionnaire and a business-reply envelope. Both versions of the questionnaire provided information which detailed the researchers involved, purpose of study, nature of and how to the answer questions, importance and voluntary nature of participation, need for accuracy and assurances of confidentiality, data protection notice, approximate time to complete the survey, aggregate nature of any subsequent data analyses and reporting, and when to return the completed questionnaire. After two mailings for the postal questionnaire and two email reminders for the web version, the following results were received: 405 'eligible' responses; 49 'non-eligible' responses; and 97 returned questionnaires. This represents a response rate of 21% or the higher rate of 23% when 'non-eligibles' in the sampling frame are adjusted for. This response rate compares reasonably well with those reported in similar UK studies (Bryde, 2008). This initial dataset with 405 cases was examined for (item and unit) non-response bias, violations of multivariate normality, and social desirability bias using the normal procedures and techniques for data examination (cf. Hair *et al.*, 2010). Those tests, not reported here because of constrains of space, led to 24 cases being discarded, resulting in an analysis sample of 381 cases.

## 2.2 Measures

*Independent variables (workgroup identification dimensions)*. Fourteen items (items 1—14 in Appendix) scored the three dimensions of workgroup identification (identification, pride, and self-respect). The items were scored on 5-point Likert responses scales (1 = *strongly disagree* to 5 = *strongly agree*).

*Identification*. Cognitive identification or self-categorization was assessed with five items (items 1—5) adapted from Mael and Ashforth's (1992) organizational identification scale. The Mael and Ashforth scale is the most widely used measure for cognitive identification and, despite criticisms by some researchers (e.g. Bergami and Bagozzi, 2000), has been shown to be empirically valid (e.g. Blader and Tyler, 2009; Johnson *et al.*, 2012).

*Pride*. Pride was measured with the four-item public collective self-esteem subscale of Luhtanen and Crocker's (1992) four-dimensional collective self-esteem scale. The four items (items 6—9 in Appendix) reflected self-evaluations of the status of one's workgroup.

*Respect*. This was measured with four items adapted from Tyler and Blader's (2001) 7-item respect scale. The items (items 10—13 in Appendix) reflected self-evaluations of felt professional respect from colleagues in one's proximal workgroup.

*Dependent variables (cooperation dimensions)*. Individuals' cooperation with the workgroup was measured with 14 items (items 14—27 in Appendix), which tapped four dimensions: in-role, extra-role, compliance, and deference behaviour. All items are based on Anvuur and Kumaraswamy (2012) and Anvuur *et al*. (2012), and were scored on a 5-point response scale (1 = *never* to 5 = *very often*).

*Control variables*. We included controls for the effects of ethnicity, age, gender and educational attainment in order to account for these possible alternative explanations for the cooperation of individuals with the TMO project workgroups. These were dummy-coded to test the effects of being Caucasian (i.e. other ethnicity = 0), older (i.e. ≤ 50 years = 0), female

(i.e. male = 0), and holding a postgraduate qualification (i.e. ≤ bachelor's degree = 0) on in-role, extra-role, compliance, and deference behaviour.

Instructions preceding questionnaire items (save demographic and social preference items) oriented each respondent to focus on his or her role in the proximal cross-functional workgroup in the referent project.

## 2.3 Analysis procedure

The statistical procedure used was structural equation modeling (SEM), with maximum likelihood estimation in AMOS software (Arbuckle, 2011). The two-step SEM approach recommended by Anderson and Gerbing (1992) was adopted. First, confirmatory factor analysis (CFA) was conducted to assess the fit to the data of competing and alternative workgroup identification measurement models. Specifically, in the first instance, the fit to the data of three congeneric measurement models were compared: a multidimensional model with (cognitive) identification, pride and self-respect loaded onto a superordinate workgroup identification construct (superordinate model); a multivariate model with the three workgroup identification dimensions represented by three first-order latent constructs (multivariate model); and a model in which all items measuring the three workgroup identification dimensions were loaded onto a single latent construct (unidimensional model). The congeneric model assumes that each individual item of a first-order latent construct or dimension of a second-order superordinate latent construct measures the latent construct with possibly a different scale, degree of precision and amount of error (Graham, 2006). Thus, the congeneric model allows item or dimension loadings and residual variances to vary freely (Edwards, 2001). Next the superordinate congeneric model was compared with a more restrictive superordinate model in which residual variances but not dimension loadings were allowed to vary freely (i.e. superordinate tau equivalent model), and also with the most restrictive superordinate model which constrained dimension loadings to be equal and residual error variances to be equal (i.e. superordinate parallel model). Each of the models also included the four cooperation dimensions (in-role, extra-role, compliance, and deference) as latent constructs. A scale was set for each first-order latent construct by fixing a path leading from the construct to unity and for the superordinate construct, by fixing its variance to unity, thereby standardizing the construct. Setting the scale for a multidimensional construct by fixing its variance makes it possible to obtain standard errors for all paths leading to or from the construct and with which to conduct statistical tests involving the multidimensional construct (Edwards, 2001).

The measurement models described above are nested and, therefore, were compared with one another using Chi-square difference tests. When assessing the absolute fit of each model to the data five fit indices were used: the $\chi^2$ statistic; normed $\chi^2$ (i.e. $\chi^2/df$); comparative fit index (CFI); incremental fit index (IFI); and root mean square error of approximation (RMSEA). Evidence of adequate model fit, for models of the kind estimated in this study, will include (cf. Hair *et al.*, 2010): a significant $\chi^2$ statistic, a $\chi^2/df$ value below 5, IFI and CFI estimates of 0.90 or higher, and RMSEA estimate below 0.08. Once adequate fit of the CFA model was obtained, a structural model containing the hypothesized relations between the superordinate workgroup identification construct and each cooperation dimension was specified and tested. Superordinate congeneric, tau equivalent, and parallel structural models were estimated, as was the multivariate structural model. Dummy-coded controls for the effect of being Caucasian (other ethnicity = 0), older (≤ 50 years = 0), female (male = 0), and holding a postgraduate qualification (≤ bachelor's degree = 0) on each cooperation dimension, and correlated residual variances of the cooperation dimensions were included in all structural models. The error variance for each dummy-coded variable was fixed to zero. The fit to the data of the three superordinate structural models in absolute and relative terms was assessed and compared with the fit of the multivariate structural model.

The validity of a set of indicators for a first-order latent construct or set of dimensions for a superordinate construct was established by examining whether the average variance extracted (AVE) is greater than 0.50 (Hair *et al.*, 2010). The reliability of a set of indicators for a first-order latent construct or set of dimensions for a superordinate construct was established by examining whether the construct reliability (CR) is greater than 0.70 (Hair *et al.*, 2010).

The relationships between dimension specificities and the effects of the superordinate workgroup identification construct were assessed as the incremental variance in each cooperation dimension explained by identification, pride and self-respect after controlling for the superordinate workgroup identification construct. This was tested using modification indices (MIs), which are chi-square distributed with $df = 1$ and indicate the expected improvement in model fit if a constrained parameter is freed (Edwards, 2001). Differences in criterion-related validity for the superordinate workgroup identification construct and its dimensions were assessed by omnibus chi-square difference tests, which compared the fit to the data of the superordinate structural model to that of the multivariate structural model, with the dimensions as correlated independent variables. Table 1 shows fit statistics for the unidimensional, multivariate, and superordinate CFA models. Table 2 shows the interconstruct correlations, AVE estimates, construct reliabilities for latent constructs. Table 3 shows the results of the superordinate and multivariate structural models.

## 3. RESULTS

### 3.1 CFA results

The analysis confirmed that the unidimensional CFA model did not fit the data well, $\chi^2$(402, $N = 381$) = 1484.97, $p = .000$, IFI = 0.80, CFA = 0.80, RMSEA = .08. The multivariate CFA model fit the data well, $\chi^2$(383, $N = 381$) = 802.94, $p = .000$, IFI = 0.92, CFA = 0.92, RMSEA = .05. The superordinate congeneric CFA model also fit the data well, $\chi^2$(399, $N = 381$) = 822.28, $p = .000$, IFI = 0.92, CFA = 0.92, RMSEA = .05, as did the superordinate tau equivalent, and parallel CFA models (see Table 1). Chi-square difference tests indicated that the fit of the superordinate congeneric CFA model was not any better than that of the multivariate model ($\Delta\chi^2$(16) = 19.34, $p > .05$). However, the superordinate congeneric CFA model had a lower normed chi-square statistic ($\chi^2/df$ = 2.06) in an absolute sense and is more parsimonious than the multivariate CFA model ($\chi^2/df$ = 2.10). The superordinate congeneric CFA model did not fit the data better than the tau equivalent model ($\Delta\chi^2$(2) = 4.76, $p = .092$). However, the superordinate parallel model was worse fitting than both the congeneric ($\Delta\chi^2$(4) = 15.79, $p = .003$) and tau equivalent models ($\Delta\chi^2$(2) = 11.03, $p = .004$). Overall, therefore, these results provide support for the multidimensional conceptualisation of group identification.

The convergent validity of the superordinate and first-order latent constructs was supported by their dimension and factor loadings, respectively. The standardised loadings of the workgroup identification dimensions were substantial and statistically significant for the congeneric model (identification, $\lambda = .81$, $p = .000$; pride, $\lambda = .67$, $p = .000$; respect, $\lambda = .71$, $p = .000$), as for the tau equivalent (identification, $\lambda = .80$, $p = .000$; pride, $\lambda = .72$, $p = .000$; respect, $\lambda = .66$, $p = .000$) and the parallel (identification, pride, respect, $\lambda = .72$, $p = .000$) models. Also, the factor loadings for the indicators of the workgroup identification dimensions and cooperation dimensions were all statistically significant ($p = .000$) and substantial for the congeneric ($\lambda$ range = 0.58−0.94, $p = .000$), tau equivalent ($\lambda$ range = 0.60−0.94, $p = .000$) and parallel ($\lambda$ range = 0.61−0.94, $p = .000$) models. These loadings produced substantially high CR estimates for the first-order dimensions of workgroup identification, identification (0.81, 0.81, and 0.82 for the congeneric, tau equivalent and parallel models, respectively), pride (0.89, 0.89, and 0.90 for the congeneric, tau equivalent and parallel models, respectively), and respect (0.95 for the congeneric, tau equivalent and parallel models, respectively). The CR estimates for the superordinate workgroup identification construct were 0.91, 0.91, and 0.90 for the congeneric, tau equivalent, and parallel models, respectively. Also, the CR estimates for first-order latent constructs of the cooperation dimensions from the superordinate congeneric model (see Table 2) were substantial, ranging from 0.83 to 0.94, and were fairly stable across the tau equivalent and parallel models as well. Thus, all CR estimates exceeded the 0.70 threshold value.

*Table 1. Fit statistics for unidimensional, multivariate, and superordinate CFA models*

| Structure | $\chi^2$ | df | $\chi^2/df$ | IFI | CFI | RMSEA |
|---|---|---|---|---|---|---|
| Unidimensional model | 1484.97 | 402 | 3.69 | .80 | .80 | .08 |
| Multivariate model | 802.94 | 383 | 2.10 | .92 | .92 | .05 |
| Superordinate congeneric model | 822.28 | 399 | 2.06 | .92 | .92 | .05 |
| Superordinate tau equivalent model | 827.05 | 401 | 2.06 | .92 | .92 | .05 |
| Superordinate parallel model | 838.08 | 403 | 2.08 | .92 | .92 | .05 |

*Note*: $N = 381$. All fit statistics are for models that also included latent constructs for the four cooperation dimensions and dummy-coded controls for respondents' ethnicity (non-Caucasian = 0), age ($\leq 50$ years = 0), gender (male = 0), and education ($\leq$ bachelor's degree = 0). IFI = incremental fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation. All $\chi^2$ statistics are significant at $p < .001$.

The dimension loadings produced AVE estimates of 0.54, 0.53, and 0.52 for the superordinate congeneric, tau equivalent, and parallel constructs, respectively. The AVE estimates for all the first-order cooperation dimensions exceeded the 0.50 threshold value (see Table 2), as did the AVE estimates for pride (0.54, 0.56, and 0.56 for the congeneric, tau equivalent and parallel models, respectively) and respect (0.73, 0.72, and 0.71 for the congeneric, tau equivalent and parallel models, respectively). Only, the AVE estimates for identification (0.44, 0.44, and 0.46, respectively for the congeneric, tau equivalent, and parallel models) were below 0.50; and this is despite the high CR estimates. Although it is not uncommon for a latent construct with high reliability to have lower-than-threshold AVE estimate (Hair *et al.*, 2010), this occurrence in the present study speaks to the broader issues in the extant literature associated with the operationalisation of the cognitive dimension of workgroup identification (cf. Bergami and Bagozzi, 2000; Edwards, 2005; Riketta, 2005). The dimension $R^2$ linking the superordinate workgroup identification construct to each of its dimensions was 0.75 for the parallel model. This is calculated by dividing the variance explained in each dimension by the total variance for the dimension (Edwards, 2001). For the tau equivalent model, dimension $R^2$ values were 0.87 for identification, 0.76 for pride, and 0.65 for respect. For the congeneric model, dimension $R^2$ values were 0.87 for identification, 0.73 for pride, and 0.69 for respect. The CRs, AVE estimates and $R^2$ values are consistent with the omnibus chi-square difference tests reported above, and provide support for the convergent validity of the superordinate workgroup identification model. Further evidence of the utility of the multidimensional conceptualisation of workgroup identification is provided below by an examination of the relationships between the superordinate construct and its dimensions, and the cooperation dimensions in the structural models.

*Table 2. Construct reliabilities, average variance extracted estimates, and construct correlations for latent constructs*

| Scale | CR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Workgroup identification | 0.91 | 0.53 | | | | | | | | |
| 2. In-role behaviour | 0.94 | 0.47[c] | 0.62 | | | | | | | |
| 3. Extra-role behaviour | 0.87 | 0.50[c] | 0.47[c] | 0.53 | | | | | | |
| 4. Compliance behaviour | 0.92 | 0.44[c] | 0.32[c] | 0.29[c] | 0.69 | | | | | |
| 5. Deference behaviour | 0.83 | 0.39[c] | 0.30[c] | 0.24[c] | 0.73[c] | 0.55 | | | | |
| 6. Ethnicity | 1.00 | 0.07 | 0.02 | 0.26[c] | 0.04 | 0.02 | 1.00 | | | |
| 7. Gender | 1.00 | −0.01 | −0.03 | 0.04 | 0.06 | 0.01 | −0.08 | 1.00 | | |
| 8. Age | 1.00 | 0.16[b] | 0.08 | 0.07 | 0.09 | 0.08 | 0.18[c] | −0.09 | 1.00 | |
| 9. Education | 1.00 | 0.02 | 0.08 | 0.09 | 0.11[a] | 0.11 | −0.08 | 0.11[a] | −0.03 | 1.00 |

*Note*. $N = 381$. Results are from the superordinate congeneric measurement model. CR, construct reliability. Entries on the diagonal are average variance extracted (AVE) estimates. Entries below the diagonal are correlations among latent constructs. Control variables were dummy-coded to measure the effect of being Caucasian (other ethnicity = 0), older ($\leq 50$ years = 0), female (male = 0), and a holder of a postgraduate qualification ($\leq$ bachelor's degree = 0).
[a] $p < .05$.
[b] $p < .01$.
[c] $p < .001$.

**3.2 SEM results**

The superordinate congeneric, tau equivalent, and parallel structural models were estimated using maximum likelihood estimation in AMOS, and comparisons were made between these and with the multivariate structural model. All models estimated included controls for the effects of ethnicity, gender, age, and education on each cooperation dimension, as well as correlated residuals of these cooperation dimensions. The SEM results are reported in Table 3. As the fit statistics in Table 3 indicate, the congeneric, tau equivalent and parallel models all fit the data well. In fact, the fit statistics are the same as those shown in Table 2 for the nested CFA models. The chi-square difference tests for the nested CFA models, therefore, also apply to the nested structural models. Thus, the parallel model has the worse fit of the three models and although there is not much else to choose between the congeneric and tau equivalent models, the congeneric model is preferred because it is simpler and more parsimonious. All three models indicated that workgroup identification was positively and significantly related to in-role ($\beta \geq 0.47$, $p = .000$), extra-role ($\beta \geq 0.47$, $p = .000$), compliance ($\beta \geq 0.43$, $p = .000$), and deference behaviour ($\beta \geq 0.38$, $p = .000$). Therefore, hypotheses $H_1$, $H_2$, $H_3$ and $H_4$ were all supported.

*Table 3. Results of structural models for workgroup identification and its dimensions*

| Workgroup identification | Cooperation dimensions | | | | $\chi^2$ | df | $\chi^2/df$ | IFI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|
| | In-role | Extra-role | Compliance | Deference | | | | | | |
| Superordinate parallel model | | | | | | | | | | |
| Identification | 0.345[c] | 0.342[c] | 0.311[c] | 0.275[c] | | | | | | |
| Pride | 0.345[c] | 0.342[c] | 0.311[c] | 0.275[c] | | | | | | |
| Respect | 0.345[c] | 0.342[c] | 0.311[c] | 0.275[c] | 838.08[c] | 403 | 2.08 | .92 | .92 | .05 |
| Superordinate tau equivalent model | | | | | | | | | | |
| Identification | 0.383[c] | 0.395[c] | 0.349[c] | 0.310[c] | | | | | | |
| Pride | 0.342[c] | 0.353[c] | 0.311[c] | 0.276[c] | | | | | | |
| Respect | 0.313[c] | 0.323[c] | 0.285[c] | 0.253[c] | 827.05[c] | 401 | 2.06 | .92 | .92 | .05 |
| Superordinate congeneric model | | | | | | | | | | |
| Identification | 0.381[c] | 0.393[c] | 0.351[c] | 0.307[c] | | | | | | |
| Pride | 0.316[c] | 0.326[c] | 0.291[c] | 0.254[c] | | | | | | |
| Respect | 0.335[c] | 0.346[c] | 0.309[c] | 0.270[c] | 822.28[c] | 399 | 2.06 | .92 | .92 | .05 |
| Multivariate model | | | | | | | | | | |
| Identification | 0.187[a] | 0.409[c] | 0.245[b] | 0.193[a] | | | | | | |
| Pride | 0.204[b] | 0.104 | 0.080 | 0.175[a] | | | | | | |
| Respect | 0.115 | 0.000 | 0.129 | 0.041 | 802.94[c] | 383 | 2.10 | .92 | .92 | .05 |

*Note*. $N$ = 381. Results are from analyses that also included dummy-coded controls for the effects of being Caucasian (Non-Caucasian = 0), older ($\leq$ 50 years = 0), female (male = 0), and holding a postgraduate qualification ($\leq$ bachelor's degree = 0) on each cooperation dimension. Only the effect of being Caucasian on extra-role behaviour was significant ($\beta$ = 0.24, $p$ = .000). For the cooperation dimensions, table entries for the superordinate parallel, tau equivalent, and congeneric models are standardized spurious relationships between the workgroup identification dimensions and the cooperation dimensions, computed as the product of each dimension loading on workgroup identification and the path coefficient from workgroup identification to each cooperation dimension; for the multivariate model, these are the standardised path coefficients. IFI = incremental fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.
[a] $p$ < .05.   [b] $p$ < .01.   [c] $p$ < .001.

Table 3 also displays the standardized spurious relationships between individual dimensions of workgroup identification and each cooperation dimension. These are computed as the product of each dimension loading on workgroup identification and the coefficient of the path from workgroup identification to each cooperation dimension (cf. Edwards, 2001). These relationships were constant (by construction) across the identification, pride, and respect dimensions for the parallel model, and did not vary markedly between the tau equivalent and congeneric models. For the congeneric model, relationships with the cooperation dimensions were strongest for identification, followed by respect and then pride. For the tau equivalent model, relationships with the cooperation dimensions were strongest for identification, followed by pride and then respect. Relationships for dimension specificities were examined using MIs for parameter directly linking identification, pride, and respect to each cooperation dimension. To control for Type I error, the recommendation by Edward (2001) to divide the nominal *p*-value of .05 value by the number of MIs examined (i.e. 3 x 4 = 12 in the present study) was followed, and this produced a critical *p*-value of .00417 and corresponding chi-square of 8.208, for *df* = 1. Across all three (congeneric, tau equivalent, and parallel) models, the MIs for all parameters directly linking identification, pride, and respect to each cooperation dimension did not exceed 2.507; that is, all MIs were below the critical chi-square value of 8.208. Therefore, the results show that after controlling for the effect of the superordinate workgroup identification construct, there is no significant direct effect of any of its dimensions on any cooperation dimension.

Finally, the results above for the parallel, tau equivalent, and congeneric superordinate structural models were compared with those for the multivariate structural model (see Table 3). The multivariate structural model fit the data well, $\chi^2(383, N = 381) = 802.94$, $p = .000$, IFI = 0.92, CFA = 0.92, RMSEA = .05. The fit of the multivariate structural model relative to the nested superordinate structural models was examined using chi-square difference tests. These tests indicated that the multivariate structural model fit the data better than the parallel model ($\Delta\chi^2(20) = 35.14$, $p = .019$) but not the tau equivalent ($\Delta\chi^2(18) = 24.11$, $p = .151$) or congeneric ($\Delta\chi^2(16) = 19.34$, $p = .251$) model. The multivariate structural model indicated (see Table 3) that respect was not significantly related to any of the cooperation dimensions, pride was significantly and positively related to only in-role, and deference behaviour, and only identification was significantly and positively related to all four dimensions of cooperation. Given that construct-level correlations between these workgroup identification dimensions ($r$s = 0.50, 0.57, 0.52, $p = .000$) and with in-role ($r \geq 0.33$, $p = .000$), extra-role ($r \geq 0.29$, $p = .000$), compliance ($r \geq 0.28$, $p = .000$), and deference ($r \geq 0.25$, $p = .000$) behaviour were significant and positive, these results indicate that the multivariate structural model underestimated the relationships between the workgroup identification dimensions and the cooperation dimensions.

## 4. DISCUSSION AND CONCLUSION

The primary purposes of this study were to inform the debate in the broader literature about the multidimensional conceptualisation and operationalisation of workgroup identification and investigate the substantive utility of the construct in construction management research, by empirically testing the effects of a superordinate workgroup identification construct –with both constrained and unconstrained model specifications – on an expanded set of dimensions of an individual's cooperation with the proximal TMO workgroup than has previously been examined in construction management research. Specifically, the findings suggest that modelling workgroup identification as a superordinate construct is tenable, better reflects the structural nature of the construct, and provides greater empirical utility relative to a model which represents the multidimensional construct as a set of correlated dimensions – or at least in the present study. Edwards (2001) argued that support for multidimensional constructs should be by exception rather than the rule. The findings of this study show that it is the *shared* variance between – rather than *unique* variance in – dimensions of workgroup identification that is the most predictive of individuals' cooperation with the workgroup. This finding is central to the very notion of a superordinate multidimensional construct (cf. Law *et al.*, 1998), and is both consistent with the theoretical conceptualisation of social identification (Tajfel, 1982; Albert *et al.*, 2000; Ashforth *et al.*, 2008) and the findings of previous empirical studies in other disciplines (e.g. Blader and Tyler, 2009).

The findings also show that workgroup identification as a superordinate multidimensional construct significantly and positively influences individuals' in-role, extra-role, compliance, and deference behaviour. Further, the regression betas were substantial, at 0.38 or higher. These findings are consistent with the findings of previous non-construction research, which reported significant effects of one or more workgroup identification dimensions for in-role (e.g. van Knippenberg, 2000), extra-role (e.g. Bergami and Bagozzi, 2000; Dukerich *et al.*, 2002; Blader and Tyler, 2009; Johnson *et al.*, 2012), compliance and deference (e.g. Tyler and Blader, 2001). Within construction management research, the finding of a significant, positive effect for individuals' extra-role behaviours in project workgroups led Phua (2004) her to conclude that (cognitive) identification deserves to be considered as a viable mechanism for redressing the age-old and almost defining construction sector problem of a lack of cooperation. The present study reinforces this by replicating Phua's (2004) findings, and also extends this work by broadening the criterion domain of workgroup identification and individuals' cooperation with the workgroup.

The finding in this study the workgroup identification – indexed via a cognitive awareness/saliency of workgroup membership, positive evaluation of the value of that membership, and emotional investment in the awareness and evaluation – provides a viable avenue through which to tap into all four dimensions of an individual's cooperation with the workgroup has practical significance for practicing project managers. First, construction TMO workgroup members are typically boundary spanners with strong professional and functional role socialisations, which have been shown to limit the amount of cooperation in projects (e.g. Ankrah and Langford, 2005). Therefore, the prospect of inclusive superordinate identification with the TMO workgroup as a viable means of overcoming the obstacles to joint construction production posed by the prejudices, adversarialism, reticence ingrained in project actors by their professional and functional role socialisations is indeed promising; and leads to the next significance of the findings in this study. The self-enhancement motive central to social identity theory suggests that the experience by an individual of a valued group identity often spurs him or her to develop attitudes and enact behaviours which are value-expressive, consistent with being or becoming a truer exemplar of that identity (Ashforth *et al.*, 2008). In this sense, therefore, the process of superordinate identification with the workgroup has the potential to create a virtuous circle; or indeed a vicious circle, where a low identifier experiencing or threatened with low status develops disidentifying attitudinal and behavioural responses that then become self-sustaining. Therefore, starting conditions are important, in respect of which the findings of this study point to the crucial role of team-building and other 'partnering' processes – what Ashforth *et al.* (2008) refer to as *sensebreaking* and *sensegiving* – which have as a primary focus the creation of a cogent, salient and valued superordinate project team identity and shared cognition for joint construction production (cf. Anvuur and Kumaraswamy, 2007). Finally, the findings of this study are seemingly instructive for and may benefit from sector-wide efforts to repair the image of construction and promote the dignity, intrinsic worth and wellbeing of its workforce (for an exposition of this argument, see Anvuur *et al.*, 2012).

One implication of the findings of this study for research is a call for future research that seeks to replicate and extend the findings reported here. For instance, future research might usefully investigate – perhaps using the integrative analytical framework developed by Edwards (2001) – the set of antecedent and effect variables for which the superordinate multidimensional conceptualisation of workgroup identification is tenable and those in respect of which workgroup identification is best modelled by its dimensions as a set. The common approach to the measurement of the cognitive dimension of workgroup identification in the extant literature has been to measure respondents' *feelings* which evidence a *perception* of oneness with the workgroup, the Mael and Ashforth (1992) scale – as adapted in the present study – being a classic example.   This operationalisation of cognitive identification and the Mael and Ashforth scale in particular has been criticised in previous research for being amiss in its criterion validity respects, especially face and content validity (e.g. Bergami and Bagozzi, 2000), and in this study was found to be lacking in convergent validity. Therefore, future research might investigate this and alternative social identity theory based measures of cognitive identification. There are limitations of this research, such as the self-report nature of the measures used, and the sample consisting predominantly of middle-aged Caucasian males in the UK, which are best left for future research to address. Nevertheless, the findings of this

study provide support for the conceptualisation and substantive validity of workgroup identification as a superordinate multidimensional construct.

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**APPENDIX: ITEM MEASURES**

*Note*: Instructions preceding the measures guided respondents to answer the questions with regard to their proximal cross-functional workgroup in the referent project, and their particular role within that workgroup. Items are referred to in tables and figures by the bullet numbers assigned them here.

**Workgroup identification**

Workgroup identification dimensions (independent variables) were scored on 5-point response scales with anchors 1 = '*strongly disagree*' to 5 = '*strongly agree*'.

*Identification.* Cognitive identification with one's workgroup was measured with five items adapted from Mael and Ashforth (1992). Items asked respondents to indicate the extent to which they agree or disagree with the following statements: (1) My work is important to the way I think of myself as a person; (2) When someone praises my project workgroup, it feels like a personal compliment; (3) When I talk about where I work, I usually say, "we" rather than "they"; (4) I feel a sense that I personally belong where I work; (5) My project workgroup says a lot about who I am as a person.

*Pride.* Pride was measured with four items adapted from the public collective self-esteem subscale of Luhtanen and Crocker's (1992) collective self-esteem scale.   Those items asked respondents to indicate the extent to which they agree or disagree with the following statements about their project role and workgroup: (6) Overall, my workgroup is considered good by others; (7) People consider my workgroup to be more ineffective than others (R); (8) In general, others respect my workgroup; (9) In general, others think that my workgroup is unimportant (R).

*Respect.* The four items measuring professional respect were adapted from Tyler and Blader's (2001) 7-item respect scale.   Items asked respondents to indicate the extent to which they agree or disagree that colleagues in their proximal workgroup: (10) respect the work they do; (11) respect their ideas; (12) value what they contribute at work; (13) value them as members of the workgroup.

**Cooperation**

All items for the cooperation dimensions (dependent variables) were based on Anvuur and Kumaraswamy (2012) and Anvuur *et al*. (2012), and were scored on a 5-point response scales with anchors 1 = '*never*' to 5 = '*very often*'.

*In-role behaviour.* This was assessed with four items. Items asked respondents to rate how often they: (14) fulfilled the responsibilities specified in their job descriptions; (15) performed the tasks that are expected as part of their jobs; (16) met the performance expectations for their job roles; (17) adequately completed their required work tasks.

*Extra-role behaviour.* This was assessed with four items. Items asked respondents to rate how often they: (18) volunteered to do things that are not required in order to help their workgroups; (19) made innovative suggestions to help improve their work settings; (20) volunteered to help others when they have heavy workloads; (21) lent a helping hand to others at work.

*Compliance behaviour.* This was assessed with three items. Items asked respondents to rate how often they: (22) complied with work-related rules and regulations; (23) followed the policies established by their supervisors; (24) carefully tried to carry out the instructions of their supervisors.

*Deference behaviour.* This was assessed with four items. Items asked respondents to rate how often they: (25) willingly followed workgroup norms and procedures; (26) did what their supervisors expected of them, even when they did not think it was important; (27) willingly accepted the decisions made by their supervisors.