Major project managers’ internal and external stakeholder relationships: The development and validation of measurement scales

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Abstract

In this paper, we detail the development of two stakeholder relationships scales. The scales measure major project managers’ perceived competence in developing (establishing and maintaining) high quality, effective relationships with stakeholders who are internal and external to their organization. Our sample consists of 373 major project managers from a sub-set of the Australian defense industry. Both the internal stakeholder relationships scale and the external stakeholder relationships scale demonstrated validity and reliability. This research has implications for the interpersonal work relationships literature and the stakeholder management literature. We recommend that researchers test these scales with multiple samples, across different project types and project industries in the future. The stakeholder relationship scales should be versatile enough to be applied to project management generally but are perhaps best suited to major project environments.

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1. Introduction

The management of the project stakeholders is considered the responsibility of the project manager. This task constitutes one of the largest components of their role (Karlsen, 2008; PMI, 2008). To mitigate the risk to the project that the stakeholders pose and to obtain the multitude of project-related benefits that follow the achievement of successful stakeholder relationships (Bourne, 2011; Karlsen, 2008; Pinto, 2000), it is critical that the project manager develops relationships with the stakeholders that are effective and of high quality. Bourne and Walker (2006: 5) define project stakeholders as “individuals or groups who have an interest or some aspect of rights or ownership in the project, and can contribute to, or be impacted by, the outcomes of a project”. The potential for stakeholders to impact the processes and outcomes of a project, and therefore its likelihood of success, has been well documented in the project management and stakeholder literature (Bourne, 2011; Bryde and Robinson, 2005; Olander and Landin, 2005; Toor and Ogunlana, 2010; Wang and Huang, 2006; Yang et al., 2011).

In particular, ineffective stakeholder management can: reduce stakeholder satisfaction with the project outcomes (Bourne, 2005); negatively impact the capabilities of an organization (Aaltonen et al., 2008); hinder future opportunities for collaboration with the stakeholders (Manowong and Ogunlana, 2010) and potentially cause harm to individuals or groups (Phillips, 2003). The stakeholder literature stipulates a number of steps for the effective management of stakeholders: 1) identify the stakeholders (Freeman, 1984); 2) select one of several stakeholder management models to categorize the stakeholders (Savage et
al., 1991); 3) engage with the stakeholder (Greenwood, 2007); and, 4) maintain the stakeholder relationship or disengage from it (Post et al., 2002).

Within the project management field, stakeholder relationships have predominately been explored using qualitative methods such as interviews, observation, storytelling, documentary examination, case studies and social network analysis (Aaltonen et al., 2010; Beringer et al., 2013; Boonstra, 2006; Bourne, 2011; Rowlinson and Cheung, 2008; Vaagaasar, 2011). For example, an innovative approach from Bourne and Walker (2005) uses a social network tool, the stakeholder circle, to determine stakeholders’ power and influence, as well as their impact on a project’s outcomes. This tool can assist project managers to develop and maintain a stakeholder engagement strategy (Bourne and Walker, 2005). By comparison, quantitative studies are less prevalent with many focusing on stakeholder satisfaction (see Pinto et al., 2009; Yang and Peng, 2008) — often as an indicator of project success (Jugdev and Müller, 2005). Beringer et al. (2013) believe that the lack of quantitative research using stakeholders as the unit of analysis may be one of the reasons that there is a scarcity of valid and reliable stakeholder engagement measures.

Our review of the stakeholder and project management literature similarly failed to yield a suitable instrument for the measurement of stakeholder relationships. A possible explanation, in addition to the one offered by Beringer and colleagues, may be the conceptualization of stakeholders as groups or organizations that need to be managed as either a risk or a resource rather than at the interpersonal level where emphasis is on the development of relationships. Adjacent to the project management literature is the strategic management literature, which also places emphasis on the effective management of the stakeholders for optimal organizational performance (Freeman, 2010; Hitt et al., 2015). However, a suitable scale for the measurement of stakeholder relationships is also missing from the strategic management literature.

We respond to this gap by conceptualizing, developing and validating two quantitative stakeholder relationship measures—the internal stakeholder relationships (ISR) scale and the external stakeholder relationships (ESR) scale. Unlike qualitative measures, quantitative measures enable the researcher to make statistical inferences about a population. The context for the development of these scales is major projects in the Australian defense industry. The defense industry refers to government and commercial enterprises involved in research, development and production of military resources. We consider the defense industry to be a suitable explanatory context for stakeholder management, with regard to the broader project management community, as many defense acquisitions projects are managed by highly trained project managers who are recognized on a global-scale for their skills and expertise, and delivered in one of the most sophisticated project environments in the world. In addition, the number of national and international, internal and external stakeholders who typically contribute to a major defense project is considerable.

The question we address in this paper is which elements should be measured to evaluate major project managers’ perceived internal and external stakeholder relationships competence? The paper is structured as follows. Theory is discussed in Section 2, followed by the method in Section 3, the results in Section 4, and the discussion in Section 5.

2. Theory

To conceptualize the internal stakeholder relationships and external stakeholder relationships constructs, the following sub-sections present our review of the relevant stakeholder management, relational competency, interpersonal relationships and project management theory and literature.

2.1. Stakeholder classification

Despite the considerable number of stakeholders typically involved in a major project, Manowong and Ogunlana (2010) stress the importance of considering all of the stakeholders’ interests. In an effort to simplify stakeholder identification and management, attempts have been made to classify stakeholders. According to Mainardes et al. (2012) the literature has suggested classifying stakeholders by levels of an attribute, such as power, legitimacy and/or urgency (see Mitchell et al., 1997), and into groups based on the potential of the stakeholder to harm or cooperate with the organization (see Savage et al., 1991). In addition, project stakeholders have been divided by type: organizational stakeholders (executives, line leaders, employees and unions), product stakeholders (customers, suppliers, governments and the general public) and capital market stakeholders (shareholders, creditors and banks; Freeman, 1984; Kerzner, 2009). They have also been differentiated in terms of whether they are considered primary or secondary stakeholders (Cleland, 1998). Most often, anyone contractually involved with the project is considered a primary stakeholder, while the secondary stakeholders are unlikely to have a contractual claim over the project or to be directly involved (Cleland, 1998; Winch, 2004). For example, Winch (2004) classifies financiers, consulting engineers, suppliers, sponsors and clients as primary stakeholders, and environmentalists, local residents and regulatory agencies as secondary stakeholders.

Project stakeholders may also be differentiated by whether the project stakeholder is situated within a project manager’s organization or outside of it. The locus of the stakeholder may impact the project manager’s management of that stakeholder. However, Manowong and Ogunlana (2010) believe that the locus of the project stakeholders should have little practical impact as all stakeholders have to be identified, and have their needs and potential to impact the project assessed. In this paper, internal stakeholders have been defined as project stakeholders within the project manager’s organization (i.e. supervisors and team members) while external stakeholders have been defined as project stakeholders outside the project manager’s organization (i.e. customers, contractors, sub-contractors and environmental or government bodies). While contacts are typically viewed as external stakeholders, we view those contractors...
contracted by the project manager’s organization to work for and within the organization as internal stakeholders. As previously mentioned, after classifying the stakeholders, the project manager should then decide whether to engage with the stakeholders by establishing and maintaining a relationship with them. Our focus is specifically on the establishment and maintenance stages of the relationship. Thus, the project manager competence of interest to this paper is relational competence.

2.2. Relational competence theory

Competency is defined by Turner et al. (2009: 199) as “a combination of knowledge (qualifications), skills (ability to do a task) and core personality characteristics (motives, traits and self-concepts) that lead to superior results”. Erpenbeck and Heye (1999 as cited in Ley and Albert, 2003) maintain that individuals use a self-organizing process whereby they draw upon their knowledge, skills and attributes to most appropriately respond to a situation. According to Boyatzis and Ratti (2009) competencies can be observed through an individual’s actions and the intent that determines the actions. Thus, once the demands of the environment have been understood, competencies may be indicative of potential performance.

Relational competence theory is a psychology theory that “focuses on how effectively we deal with each other, with intimates and non-intimates in close/distant, committed/uncommitted, dependent/interdependent/independent, and short/prolonged relationships” (L’Abate et al., 2010: 7). Competency theory has informed our conceptualization, and subsequently our measurement, of the stakeholder relationship construct. To ascertain whether major project managers will be able to establish and maintain an effective and high quality relationship with internal and external stakeholders, a measure of their perceived stakeholder relationship competence is required. Cable and DeRue (2002) have found perceived fit to be a better proximal determinant of attitudes and behaviors than actual or objective fit.

2.2.1. Interpersonal work relationship developmental stages

In a qualitative case study of three engineering projects, Karlson (2008) noted that the benefits gained from project manager–stakeholder relationships emerge over the lifecycle of a project and do not occur immediately. In addition, Karlson has observed project managers’ ability to influence the development of their relationships with project stakeholders. We conceptualize the major project manager–stakeholder relationship concept as consisting of developmental stages. The developmental stages of interpersonal relationships have been found to differ as a function of relationship type. For instance, a model of marketing relationship formation has been developed by Dwyer et al. (1987) involving the following stages: awareness, exploration, expansion, commitment and dissolution. Ferris et al (2009) have outlined five stages of the buyer–seller relationship as: initial interaction, development and expansion of roles, expansion and commitment, and increased interpersonal commitment. As another example, Knapp’s (1978) staircase model of social relationships consists of the following stages: initiating, experimenting, intensifying, integrating, bonding, differentiating, circumscribing, stagnating, avoiding and terminating. Welch and Rubin (2002) believe that Knapp’s relationship stages should extend to business relationships; however, they expect that the message themes will differ.

An alternative model to these logically-sequenced developmental stage models is Gersick’s (1991) model of group development as one of punctuated equilibrium. Gersick developed this model in response to the critique of developmental stage models as lacking in empirical validity. Gersick (1991) theorizes that groups are systems that go through ‘sudden’ formation, maintenance and revision stages, develop differently from one another due to influences from the external environment and the system itself, and do not typically develop in a ‘forward’ direction.

While relationship development stages and their sequence vary across different types of relationships and models it is generally conceded that all relationships involve a period of initiation or establishment, a middle stage usually characterized by relationship maintenance behaviors, and an end stage involving the dissolution or termination of the relationship (Ferris et al., 2009; Knapp, 1978; Moore and Craig, 2010). As the developmental phases of the major project manager–stakeholder relationship have not yet been identified, this research examines the overarching early and middle stages of relationship development. The early stage has been labeled ‘establishment’ while the middle stage has been labeled ‘maintenance’. Relationship termination has not been included as this research focuses on the development of relationships as opposed to their dissolution.

Instruments to assess romantic relationship maintenance strategies (Canary and Stafford, 1992; Stafford, 2011) and organization-public/organization-employee relationship maintenance strategies (Shen, 2011) exist, however, an instrument that measures individuals’ perception of their competence in establishing and/or maintaining their interpersonal work relationships could not be found. In consideration of the unique features that characterize an interpersonal work relationship (Ferris et al., 2009; Waldron, 2003), a new instrument should be constructed to measure the establishment and maintenance of interpersonal work relationships as opposed to adapting an instrument used to measure other types of interpersonal relationships, such as romantic relationships. We define the stakeholder relationship development construct as major project managers’ overall assessment of the interactive and non-interactive, actions and activities they perform to establish and maintain interpersonal work relationships with their project stakeholders. This definition has been adapted from Canary and Stafford’s (2001) relational maintenance behaviors definition.

2.2.2. Interpersonal work relationship dimensions

Two interpersonal work relationship dimensions have been selected for analysis in this research: quality and effectiveness. These two dimensions have been selected as they are thought to represent interpersonal work relationships best in terms of health and outcomes. Health or state, quality and outcomes are the three components most commonly used to define interpersonal relationships (Ragins and Dutton, 2007). In addition, there is a clear association between interpersonal work relationship quality and interpersonal work relationship effectiveness, and other relationship dimensions, as well as the developmental...
stages of interpersonal work relationships (Allen and Eby, 2003; Aurier and N’Goa, 2010; Graziano and Musser, 1982). Sub-factors of a concept should relate to one another as this suggests that they are representing features of the same construct.

We define stakeholder relationship quality as major project managers’ overall assessment of the capacity of their stakeholder relationships to withstand project-related stressors from within and outside of the relationship. Relationship quality is commonly perceived as a multi-dimensional, second-order construct often consisting of satisfaction, trust and commitment (Dant et al., 2013; Palmatier et al., 2006). These three dimensions have also been used as measures of stakeholder–organization relationship quality (Bhattacharya et al., 2009; Ki and Hon, 2012). Subsequently, we hypothesize that stakeholder relationship quality will consist of three sub-dimensions: satisfaction, trust and commitment.

Satisfaction is the most commonly used measure of relationship quality (Ki and Hon, 2012). There are several interpersonal relationship satisfaction scales (Kohli and Jaworski, 1994; Li and Dant, 1997; Mohr et al., 1996; Ping, 1993). However, these scales have been developed for relationship types other than stakeholder relationships and are based on a different conceptualization of satisfaction to the one used in this research. For example, the satisfaction (relationship) scale was developed by Li and Dant (1997) to measure the extent that a trade party’s relationship with a channel member is perceived as satisfactory, worthwhile and productive. This scale consists of three items measured on a five-point Likert scale. The items assess the relationship in terms of productivity, how worthwhile the respondent perceives the time and effort that they have invested in the relationship, and whether the relationship has been satisfactory. This measure was not considered suitable for several reasons.

First, the productivity item appears to be measuring the relationship effectiveness construct which has been conceptualized by this research as related to, yet distinct from, relationship quality. Second, ‘worthwhile’ does not necessarily equate to ‘satisfactory’. A perception of the time and effort invested in a stakeholder relationship as being worthwhile may not necessarily translate into satisfaction with the relationship given the relationship may be achieving its purpose (therefore, the time and effort have been worthwhile), yet the quality of the relationship may be poor; thereby confounding the respondent’s perceived satisfaction with the relationship. However, the items are well suited for their intended purpose, which is to measure the relationship in terms of how worthwhile, satisfactory and productive it is.

Other satisfaction scales that fall into this category include Mohr et al. (1996) satisfaction (relationship with the manufacturer) scale, Ping’s (1993) satisfaction (wholesaler) scale which has been adapted from Dwyer et al. (1987) satisfaction scale, and Hendrick’s (1988) relationship assessment scale. In particular, Kohli and Jaworski’s (1994) satisfaction (with co-worker) scale appears to measure respondents’ satisfaction with their co-worker as a person (i.e. ‘my fellow workers are boring’) rather than the respondents’ satisfaction with the relationship. The second relationship dimension thought to constitute a sub-factor of the major project manager-stakeholder relationship concept is effectiveness.

A stakeholder relationship may be considered effective when its objectives or aims are achieved. These aims include eliciting particular information from the stakeholder; facilitating the application of a formal stakeholder analysis; predicting future stakeholder behavior and reactions; actively addressing problems as they arise; facilitating the reciprocal flow of information; and ensuring the relationship endures throughout the lifecycle of the project and into the future (Bourne and Walker, 2006; Jepsen and Eskerod, 2009; Manowong and Ogunlana, 2010). More specifically, project managers may consider their stakeholder relationship to be effective when the stakeholder delivers services they require. Project managers may further consider the relationship to be effective when they, in turn, deliver the services that the stakeholder requires.

Ineffective stakeholder management has been associated with: a decreased likelihood of project success; reduced stakeholder satisfaction with the project outcomes; a negative impact on the feasibility and viability of an organization; hindrance to future opportunities for collaboration with the stakeholders; and the potential to cause harm to individuals or groups (Bourne and Walker, 2005; Foley and Zahner, 2009; Manowong and Ogunlana, 2010; Phillips, 2003; Preble, 2005; Sutterfield et al., 2006). We define the stakeholder relationship effectiveness variable as major project managers’ overall assessment of how well their stakeholders deliver the services that they require, and in turn, how well they deliver the services that their stakeholders require.

Following our review of the project management, stakeholder, interpersonal work relationships and competency literature, we again pose our research question: Which elements should be measured to evaluate major project managers’ perceived internal and external stakeholder relationships competence?

3. Method

3.1. Research design and procedure

Our research consists of six phases. In the first phase, our review of the project management, stakeholder and interpersonal relationship literature informed our selection of two relationship developmental stages (establishment and maintenance) and two relationship dimensions (quality and effectiveness), which form the basis for our conceptualization of stakeholder relationships. Three scales from the marketing and job-fit literature have been used to guide the form and content of the internal stakeholder relationships (ISR) scale and the external stakeholder relationships (ESR) scale item statements. They were Fisher et al. (1997) relationship effectiveness scale, which was developed from Ruekert and Walker’s (1987) research, Ping’s (1993) satisfaction (wholesaler) scale and Abdel-Halim’s (1981) perceived ability-job fit scale. Our use of each scale is discussed.

Fisher et al. (1997) item “do you feel your relationship with the engineering contact is productive?” was used to inform the content of the scale item “my stakeholder relationships provide
me with everything that I need from the relationship to do my job”. Ping’s (1993) satisfaction (wholesaler) scale includes items that ask respondents for an overall assessment of their satisfaction with their wholesaler relationship. Ping’s (1993) item “all in all, my relationship with my primary wholesaler is very satisfactory” has been adapted for use in this research such that the stakeholder relationship quality sub-factor includes the item “all in all, I am satisfied with my stakeholder relationships”.

The form of Abdel-Halim’s (1981) item statements was then used to inform the ISR and ESR scale item statements. For instance, two of Abdel-Halim’s items are “I feel competent and fully able to handle my job” and “I feel that my job and I are well-matched”. These items correspond to the following two items in the scales: “I feel competent and fully able to maintain relationships with a stakeholder” and “I feel that my personal attributes (or characteristics) are well suited to establishing relationships with stakeholders”.

In phase two, item statement generation, a large number of potential sample items were created to reflect each of the constructs sub-factors (development, quality and effectiveness). The item stems that best reflected the sub-factors were then converted into item statements. The form of the statements was determined by the unit of analysis and the measurement scale as suggested by Lewis et al. (2005). Following DeVillis’ (2003) recommendation, each statement was positively worded, and written as clearly and succinctly as possible. The items were measured using a Likert scale from 1 (strongly disagree) to 5 (strongly agree). A pre-test sample of 36 postgraduate students was then used in the third phase to obtain feedback on features of the instrument such as the wording of the items, terminology, content, layout, instructions and length. In the fourth phase, the feedback was incorporated into the instrument, and the item statements were reviewed by four academics in the business management field and checked for construct validity. Revisions were made to the items accordingly. In the fifth phase, we included the final version of the ISR and ESR scales in an online survey in Survey_Monkey that was then distributed to the participants. The final phase (phase six) involved the collection and analysis of the data.

3.2. Participants

Our population consists of major project managers contributing to major projects in the defense industry within Australia. The online survey was distributed to employees contributing to major projects through a number of military defense contracts via email. The human resource manager in the participating organization distributed the emails to each staff member. Of the 2500 surveys that were distributed as part of the larger survey, 1582 were returned (response rate of 63.3%). The 373 respondents that identified themselves as managers of major projects, and remained after the data was cleaned, were selected for inclusion as participants in this study. 313 (83.9%) of the respondents were male and 60 (16.1%) were female. The age bracket with the largest number of participants was the 46 to 50 age bracket (21.2%) followed by the 55 to 64 age bracket (18.5%). Just under half of the participants had a masters degree (44%) while 27.1% had an undergraduate degree. Almost all of the participants (91.2%) work as part of a team. 48.2% of participants had spent 1 to 5 years as a member of their project team, 31.6% had spent 6 to 10 years as a member of their project team and 17.1% had spent more than 11 years as a member of their project team.

4. Results

4.1. Analysis

All statistical analyses were conducted using SPSS version 19.0 and Mplus version 6. Before analyzing the data, univariate histograms, expected normality probability plots and Fisher’s skewness and kurtosis coefficients were examined to assess the distribution of the items. All items were slightly negatively skewed with an absolute value below 1.20 indicating univariate normality. The kurtosis values were positive indicating that the distributions were leptokurtic. Cases where all of the item responses were the same or more than 10% of the data was missing were removed from the dataset. There were no univariate outliers identified in the data as all item responses were within the range of the scales and were therefore deemed representative of the population. This assumptions testing procedure indicated that the data should be treated as normally distributed and that it should not be transformed. We then conducted Little’s (1988) missing completely at random (MCAR) test. As Little’s (1988) test identified the data as missing at random (MAR) the dataset was imputed using the EM maximum likelihood estimation technique. An inspection of the VIF and tolerance values did not find evidence for multicollinearity as the VIF values were less than 10.00 (VIF values < 3.15) and the tolerance values were greater than .10 (tolerance values > .30). Flynn and Pearcy (2001) recommend 10 participants per item for the purposes of scale development. As 17 items were generated for the ISR and ESR scale, the sample size is considered suitable. The data was analyzed using exploratory and confirmatory factor analysis. For the purposes of factor analysis, our sample size of 373 is considered optimal (Byrne, 2010; Reise et al., 2000).

4.1.1. Model fit indices

The fit indices that we report comprise the $\chi^2$ statistic, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean residual (SRMR). The CFI compares the model that is being assessed and an independent model that assumes the variables are uncorrelated while the TLI compares the normed chi-squared values for the hypothesized model and the null model. As the TLI is not normed, values can range below 0 and over 1 (Hair et al., 2010). Cutoff values greater than .95 indicate that the data fits the model (Hu and Bentler, 1999). RMSEA accounts for the error of estimation in the population, while SRMR reflects the average distance between the observed covariance matrix and the expected covariance matrix (Byrne, 2010). Hu and Bentler (1999) recommend cutoff values of .06 for the RMSEA and .09 for SRMR.
4.2. Internal stakeholder relationships scale

4.2.1. Exploratory factor analysis

The Pearson correlation coefficients ranged from $r = .22$ to .73. According to Abu-Bader (2010) this suggests that none of the items can be explained by the other items as multicollinearity occurs when the correlation between two variables exceeds the cutoff of .80. An exploratory factor analysis was conducted on the 17 items in the scale (Appendix A) to assess whether the items loaded onto separate factors. A principal axis factoring (PAF) method of extraction was selected with an oblique rotation. The pattern matrix was examined to determine which items loaded onto each of the three factors above .5 and with a loading less than .3 on the other two factors (Hair et al., 2010). Items that did not meet this requirement were deleted. The factor analysis was re-run after the deletion of an item. Subsequently, items iEstablish1 and iMaintain1 were deleted from the ISR scale.

Before the data was analyzed further, the suitability of the data set for factorability was examined. The sampling adequacy required for factorability was examined. The sampling adequacy of .6. To assess the significance of the correlations within the correlation matrix, Bartlett’s test of sphericity was requested in the analysis. The test achieved statistical significance ($\chi^2 = 3064.849, df = 105, p < .001$), which further supported the factorability of the items.

The PAF revealed a 15 item scale that loaded onto three separate factors. Eigenvalues indicate the degree of variance accounted for by an individual factor. Three factors had eigenvalues greater than 1. All were significant and therefore retained (Hair et al., 2010). The three factors explained 66.28% of the total variance and 46.14%, 12.45% and 7.69% of the variance respectively. The item loadings were all greater than .55. A visual inspection of the scree plot indicated a break at the fourth factor. However, the scree plot typically suggests one to three more factors for inclusion than the eigenvalues (Hair et al., 2010). Factor one was labeled internal stakeholder relationship quality. This factor consists of six items. Factor two consists of two relationship establishment items and three relationship maintenance items. This factor was labeled stakeholder relationship development. The third factor consists of four items and has been labeled internal stakeholder relationship effectiveness. The following confirmatory factor analysis is expected to identify any items that may be cross-loading onto other items.

4.2.2. Confirmatory factor analysis

The next step was to compare two alternative structures of the ISR construct to assess which structure has better model fit. The first model (Model A) is a one-factor first-order model of ISR and the second model (Model B) is a second-order model with ISR operating as the second-order factor. As Model A demonstrated worse fit ($\chi^2$/df < 10.43, TLI > .67, CFI < .72, RMSEA > .16, SRMR > .09) than Model B ($\chi^2$/df < 3.10, TLI > .67, CFI < .72, RMSEA > .07, SRMR > .05), the second-order, three-factor model structure of ISR was used. The modification indices were examined to assess whether any of the error terms were co-varying with each other (M.I > 10.00).

The item with the lowest squared multiple correlation was then deleted. This process resulted in the deletion of items iMaintain4, iMaintain2 and iQuality1. The final model demonstrated good fit ($\chi^2$/df < 2.12, TLI > .97, CFI < .97, RMSEA > .05, SRMR > .03). All modification indices were less than 10.00 indicating that no other items were co-varying with one another. After each item had been deleted the AIC and BIC values were checked to ensure they continued to decrease.

The standardized estimates and the squared multiple correlation (SMC) for the final version of the ISR scale are presented in Table 1. Standardized estimates of .5 are adequate while standardized estimates of .7 or higher are considered optimal. High standardized estimates suggest that the items have good convergent validity (Hair et al., 2010). As all of the standardized estimates were above .63, all were retained. SMCs are sometimes referred to as item reliability (Hair et al., 2010). Item reliability above .5 demonstrates that the item is a good indicator of the variable it has been designed to reflect. As all of the SMC values are above .45 it is evident that the items have good reliabilities (Holmes-Smith, 2011). Tests for discriminate validity revealed that each of the three constructs in the ISR scale is significantly different from one another (difference: chi-square = 314.71; df = 3; p = .00).

4.2.3. Bivariate correlations

Bivariate correlations were conducted on the three latent factors. All correlations were of moderate strength (.49 to .61). As each correlation was below the cutoff of .7 it is evidence that each latent factor is distinct (Hair et al., 2010). Each latent factor was found to have an adequate Cronbach’s alpha above .7: internal stakeholder relationship development (M: 4.11; SD: .50; Alpha: .85); internal stakeholder relationship quality (M: 3.93; SD: .50; Alpha: .86); and internal stakeholder relationship effectiveness (M: 4.73; SD: .50; Alpha: .87). The highest SMC was .87 and the lowest 0.45.

Table 1

<table>
<thead>
<tr>
<th>SMC value</th>
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<td>.70</td>
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Note. SMC = SMC; I = Internal.
Table 2
Final internal stakeholder relationships scale item statements.

<table>
<thead>
<tr>
<th>Items</th>
<th>Code</th>
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<tbody>
<tr>
<td><strong>Internal stakeholder relationship development</strong></td>
<td></td>
</tr>
<tr>
<td>1. I feel competent and fully able to maintain relationships with people I work with.</td>
<td>iMaintain3</td>
</tr>
<tr>
<td>2. I feel that my personal attributes (or characteristics) are well suited to establishing work relationships.</td>
<td>iEstablish4</td>
</tr>
<tr>
<td>3. I feel competent and fully able to establish a relationship with people I work with.</td>
<td>iEstablish3</td>
</tr>
<tr>
<td><strong>Internal stakeholder relationship quality</strong></td>
<td></td>
</tr>
<tr>
<td>4. I am satisfied with the benefit I receive from my relationships with those I work with.</td>
<td>iQuality2s</td>
</tr>
<tr>
<td>5. I am committed to the people I work with.</td>
<td>iQuality3c</td>
</tr>
<tr>
<td>6. My feelings toward those I work with are positive.</td>
<td>iQuality4s</td>
</tr>
<tr>
<td>7. I feel enthusiastic about my relationships with the people I work with.</td>
<td>iQuality5s</td>
</tr>
<tr>
<td>8. All in all, I am satisfied with my relationships with those people I work with.</td>
<td>iQuality6s</td>
</tr>
<tr>
<td><strong>Internal stakeholder relationship effectiveness</strong></td>
<td></td>
</tr>
<tr>
<td>9. My work relationships always achieve their objectives.</td>
<td>iEffective1</td>
</tr>
<tr>
<td>10. My work relationships provide me with everything that I need from the relationship to do my job.</td>
<td>iEffective2</td>
</tr>
<tr>
<td>11. I think all my relationships with those I work with are successful.</td>
<td>iEffective3</td>
</tr>
<tr>
<td>12. My relationships with those I work with achieve their purpose.</td>
<td>iEffective4</td>
</tr>
</tbody>
</table>

Note. I = Internal; S = Satisfaction; C = Commitment.

relationship effectiveness (M: 3.66; SD: .58; Alpha: .81). The final internal stakeholder relationship scale item statements that correspond to each of the three sub-factors have been included in Table 2.

4.3. External stakeholder relationships scale

4.3.1. Exploratory factor analysis

The Pearson correlation coefficients ranged from $r = .23$ to .74, indicating that none of the items could be explained by the other items. An exploratory factor analysis was conducted on the 17 items in the ESR scale to assess whether the items were loading onto separate factors. A PAF method of extraction was selected with an oblique rotation. An inspection of the pattern matrix indicated that the items were loading onto just two factors. As the items have been designed to reflect three distinct factors and the three factors were revealed in the ISR scale, we requested the analysis to extract a fixed number of factors (three) as opposed to allowing the analysis to base the extraction on eigenvalues greater than 1. The factor analyses resulted in the deletion of items xEstablish1 and xMaintain1. The sampling adequacy was further supported by an inspection of the Kaiser–Meyer–Olkin statistic (.92) as it exceeded the cutoff recommended by Hair et al. (2010) of .6. To assess the significance of the correlations within the correlation matrix, Bartlett’s test of sphericity was requested. The test achieved statistical significance ($\chi^2 = 3902.356$, df = 105, $p < .001$), which further supported the factorability of the items.

Two factors had eigenvalues greater than 1, all were significant and therefore, retained (Hair et al., 2010). One of the factors had an eigenvalue of .94. As there are fewer than 20 items, too few factors are typically extracted. Thus, three factors were retained. The three factors explained 71.27% of the total variance and 52.18%, 12.82% and 6.27% of the variance respectively. A visual inspection of the scree plot indicated a break at the third factor. Next, the pattern matrix was examined to determine which items loaded onto each of the three factors above .5 and with a loading less than .3 on the other two factors (Hair et al., 2010). The factor analysis revealed a 15 item scale, which loaded onto three separate factors.

Although item xQuality1 and item xQuality2 were loading onto a second factor (factor one) above the recommended cutoff of .30 these items were retained they only just exceeded the cutoff. Factor one was labeled external stakeholder relationship effectiveness. This factor consists of four items. The second five item factor was labeled external stakeholder relationship development. The third factor consists of six items and has been labeled external stakeholder relationship quality.

4.3.2. Confirmatory factor analysis

The next step was to compare two alternative structures of ESR to assess which structure has better model fit. The first model (Model F) is a one-factor first-order model of ESR and the second model (Model G) is a second-order model with ESR operating as the second-order factor. As Model G demonstrated better fit ($\chi^2$/df < 4.00, TLI > .92, CFI < .93, RMSEA > .09, SRMR > .05) than Model F ($\chi^2$/df = 13.16, TLI = .67, CFI = .72, RMSEA = .18, SRMR = .10), the second-order model of ESR was used. The modification indices were examined to assess whether any of the error terms were co-varying (M.I > 10.00). Once again, the item with the lowest squared multiple correlation was removed from the scale. This process resulted in the removal of items xMaintain4, xQuality1 and xQuality3. The final model (Model J) demonstrated good fit ($\chi^2$/df < 2.14, TLI > .97, CFI < .98, RMSEA > .06, SRMR > .04). All modification indices were less than 10.00 indicating that no other items were co-varying with one another. Table 3 presents the standardized estimates and the SMCs for the final ESR scale items. As all of the standardized estimates were above .67, all were retained. It is evident that the items have good reliability as all of the SMC values are above .43 (Holmes-Smith, 2011). Tests for discriminate validity revealed that each of the three constructs in the ESR scale are significantly different from one another (difference: chi-square = 441.48; df = 3; $p = .00$).

4.3.3. Bivariate correlations

Bivariate correlations were conducted on the three latent factors. All three correlations were of moderate strength (.50 to .72). As each correlation was nearing or below the cutoff of .7 it is evidence that each latent factor is distinct (Hair et al., 2010). The identification of associations between the interpersonal dimensions, and between the dimensions and the interpersonal developmental stages supports previous research (Allen and Eby, 2003; Aurier and N’Goala, 2010; Graziano and Musser, 1982). Each latent factor was found to have an adequate Cronbach’s alpha above .7: external stakeholder relationship development...
(M: 4.02; SD: .49; Alpha: .87); external stakeholder relationship quality (M: 3.75; SD: .56; Alpha: .87); and external stakeholder relationship effectiveness (M: 3.56; SD: .63; Alpha: .88). The final external stakeholder relationships scale item statements that correspond to each of the three sub-factors have been included in Table 4.

4.4. Validation of scales

The nomological validity of the ISR and ESR scales has been assessed by Mazur et al. (2014) who found a significant positive relationship between ISR and perceived ratings of project success (b = .23, p < .001) and a significant positive relationship between ESR and perceived ratings of project success (b = .34, p < .001).

5. Discussion

In this paper, we develop instruments to measure the internal stakeholder relationships and external stakeholder relationships constructs. More specifically, we develop measures of major project managers’ perceived competence in developing high quality, effective relationships with internal and external project stakeholders. The ISR and ESR constructs are second-order constructs each consisting of three sub-factors: stakeholder relationship development, stakeholder relationship quality and stakeholder relationship effectiveness. Each scale consists of twelve items. The ISR and ESR scales differ in only three ways: 1) the wording differs so that the ISR scale relates to internal stakeholders, i.e. "people I work with", and the ESR scale relates to external stakeholders, i.e. ‘stakeholders’; 2) the external stakeholder relationships development sub-factor contains one additional item that failed to load on the internal stakeholder relationships development sub-factor. This item, “I find it easy to maintain a relationship with a stakeholder”, is a stakeholder relationships maintenance item; and 3) the internal stakeholder relationships quality sub-factor only assesses satisfaction. We also assessed the discriminant validity of the sub-factors to ensure they are each measuring conceptually distinct concepts. Together, these tests suggest that the ISR and ESR scales are of sufficient reliability and validity to warrant further testing and development. Next we discuss the limitations of our study and provide recommendations for the future testing and development of the ISR and ESR scales.

5.1. Limitations

Here we discuss three limitations of our work. First, the single item used to measure trust in the stakeholder relationship quality sub-factor was deleted as this item was co-varying with other quality items in both the ISR and the ESR scale. Although Andersen and Kumar (2006) argue role-based, work relationships have to include trust, other researchers, such as Guitot (1977), suggest that trust does not occur in these types of relationships. However, Andersen and Kumar’s research focused on the buyer-seller work relationship only.

The conceptualization of trust as a single dimensional concept, and the subsequent development of a single-item measure, is a limitation of this study. The research demonstrates both...
conceptually and empirically, that trust is multi-dimensional (See Lewicki and Bunker, 1996; Pinto et al., 2009). For example, research has linked trust with competence and integrity (Pinto et al., 2009). Therefore we recommend future development of the ISR and ESR scales should further investigate the role of trust and commitment as multi-dimensional constructs in the measurement of interpersonal stakeholder relationship quality as suggested by Miller and Mitamura (2003).

Second, the ISR and ESR scales were developed and tested using a small sample of 36 postgraduate students and a sample of 373 major project managers. Nevertheless, the scales performed consistently when the model was tested on another sub-set of participants that responded to the survey—those participants that did not identify as project managers. As major project manager competencies have been found to differ as a function of project size, industry and type (Müller & Turner, 2010) future research should test and further develop these scales using different samples across different project industries and project types within Australia and overseas as suggested by Flynn and Peary (2001).

The third limitation relates to the purpose of the ISR and ESR scales to measure major project managers’ perceptions of their stakeholder relationship competence as opposed to their actual competence. There are three reasons why the decision was made to assess perceived rather than actual competence. First, as discussed previously, subjective complexity has been found to predict performance (Maynard and Hakel, 1997). Therefore, the major project managers’ subjective assessment of their stakeholder relationships may also influence their performance at work. Second, the ISR and ESR measures were designed to assess major project managers’ perceived stakeholder relationship competence rather than their actual stakeholder relationships as stakeholder locus is being assessed and whether a stakeholder is internal or external can be determined by how they are perceived by the observer (Sutterfield et al., 2006). In the future, the construct validity of the ISR and ESR scales could be further tested by assessing the internal and external stakeholders’ perception of the development, effectiveness and quality of their relationships with the major project managers.

Third, although there is an objective form of competence, which can be measured using standard tests (Winterton et al., 2006), subjective competence, which is the “assessment of abilities and skills needed to master tasks and solve problems relevant to performance” (Winterton et al., 2006, p.15) is the form of competence of interest to this research. Ley and Albert (2003) argue this latter type of competence cannot be directly observed as it is conceptually distinct from behavior. Subsequently, subjective measures are more appropriate.

Despite these limitations the ISR and ESR scales demonstrate construct validity and show promise for use as representations of the internal stakeholder relationships and external stakeholder relationships concepts in the future. In particular, as Mazur et al. (2014) show, major project managers’ perceived stakeholder relationship competence is significantly associated with the major project managers’ perception of the likelihood that their project will be implemented successfully. Thus, those major project managers who feel they lack the knowledge, skills and abilities to develop high quality, effective relationships with their internal and external stakeholder believe that their project is unlikely to be implemented successfully in the future and vice-versa.

5.2. Implications

Mainardes et al. (2012) note that, while the extant stakeholder theory acknowledges that organizations need to relate to their stakeholders, the nature of these relationships has not yet been fully examined. Likewise, we were unable to find a stakeholder theory that: views the stakeholder at the individual unit of analysis; treats the stakeholder as a person rather than as a risk to be avoided or a resource to be managed; and/or places importance on the interpersonal relationship between individual stakeholders and an individual representative for the project or organization. Mainardes et al. (2012, p.1862) suggest that “models which explain and guide these relationships represent a clear means of advancing stakeholder theory”. Thus, this research adds to existing theoretical insights on stakeholder management by focusing on the interpersonal relationship between stakeholders and project managers, and by viewing the stakeholder, first and foremost, as a person.

The outcomes of this study also constitute a theoretical contribution to knowledge through the creation of an approximation of internal stakeholder relationships and external stakeholder relationships, which can be used to associate these constructs with other constructs of interest, and to identify antecedents and consequences of stakeholder relationships (Hensley, 1999). The ISR and ESR scales have important implications for project management practitioners. The measures provide valid and reliable measures of major project managers’ perceptions of their competence in developing high-quality, effective relationships with internal and external stakeholders. Therefore, the ISR and ESR scales should assist in the assessment of major project managers’ stakeholder relationship competence. The scales can be used as a benchmarking tool and in identifying suitable project managers to move into major project management roles. In addition, the ISR and ESR scales can also be used to ascertain whether major project managers require stakeholder relationship training and development.

These research outcomes also have implications for the interpersonal work relationship literature in identifying the developmental stages and dimensions of a specific form of interpersonal work relationships—major project manager–stakeholder relationships. These developmental stages (establishment and maintenance) and dimensions (quality and effectiveness) may reflect other forms of interpersonal work relationships, such as team member relationships and employee–customer/client/supervisor relationships. In addition, this research has implications for the interpersonal work relationship literature and the individual differences literature in assessing the capacity of individual differences in relationship functioning to predict work behavior. We anticipate that these scales are versatile enough to be applied to project management generally. However, as the scales have been developed from a sample of project managers working on major projects we anticipate that these scales will have even greater relevance in complex project environments.
Conflict of interest

There is no conflict of interest relating to the support this research received.

Acknowledgments

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Appendix A

Original survey items before exploratory and confirmatory analysis.

Instructions: Please consider the following statements with regard to your professional relationships with people you work with on a regular basis within (participant’s organization). Please read each statement and indicate the extent to which you agree or disagree on the scale provided.

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>iEstablish1</td>
<td>Whenever I attempt to establish a relationship with a person I need to work with, I am successful.</td>
</tr>
<tr>
<td>iEstablish2</td>
<td>I enjoy establishing relationships with those I work with.</td>
</tr>
<tr>
<td>iEstablish3</td>
<td>I feel competent and fully able to establish a relationship with people I work with.</td>
</tr>
<tr>
<td>iEstablish4</td>
<td>I feel that my personal attributes (or characteristics) are well suited to establishing work relationships.</td>
</tr>
<tr>
<td>iMaintain1</td>
<td>Whenever I attempt to maintain a relationship with a person I work with, I am successful.</td>
</tr>
<tr>
<td>iMaintain2</td>
<td>I find it easy to maintain relationships with people I work with.</td>
</tr>
<tr>
<td>iMaintain3</td>
<td>I feel competent and fully able to maintain relationships with people I work with.</td>
</tr>
<tr>
<td>iMaintain4</td>
<td>I feel that my personal attributes (or characteristics) are well suited to maintaining relationships with those I work with.</td>
</tr>
<tr>
<td>iQuality1</td>
<td>I trust the people I work with.</td>
</tr>
<tr>
<td>iQuality2</td>
<td>I am satisfied with the benefits I receive from my relationships with those I work with.</td>
</tr>
<tr>
<td>iQuality3</td>
<td>I am committed to the people I work with.</td>
</tr>
<tr>
<td>iQuality4</td>
<td>My feelings toward those I work with are positive.</td>
</tr>
<tr>
<td>iQuality5</td>
<td>I feel enthusiastic about my relationships with the people I work with.</td>
</tr>
<tr>
<td>iQuality6</td>
<td>All in all, I am satisfied with my relationships with those I work with.</td>
</tr>
<tr>
<td>iEffective1</td>
<td>My work relationships always achieve their objectives.</td>
</tr>
<tr>
<td>iEffective2</td>
<td>My work relationships provide me with everything that I need from the relationship to do my job.</td>
</tr>
<tr>
<td>iEffective3</td>
<td>I think all my relationships with those I work with are successful.</td>
</tr>
<tr>
<td>iEffective4</td>
<td>My relationships with those I work with achieve their purpose.</td>
</tr>
</tbody>
</table>

Note. The final survey items have been identified with an asterisk; T = Trust; S = Satisfaction; C = Commitment.

References
