Manager emotional intelligence and project success: The mediating role of job satisfaction and trust

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Abstract

The number of complex projects is increasing across many sectors and the associated challenges are substantial. Using a field study we aim to understand how project managers' emotional intelligence (EI) contributes to project success. We propose and test a model linking EI to project success and examine the mediating effects of project managers' job satisfaction and trust on this relationship. Based on data collected from 373 project managers in the Australian defence industry, our results indicate that EI has a positive impact on project success, job satisfaction, and trust. Moreover, we found evidence that job satisfaction and trust mediate the relationship between EI and project success. Our findings suggest that top management should be aware of the importance of project managers' job satisfaction and trust, which can both serve to boost project success in complex project situations.

1. Introduction

The globalisation and rapid growth of industry has increased the number of complex projects across many sectors, including defense, infrastructure, and aerospace. The challenges associated with these projects are substantial. Indeed, almost every complex project is seemingly a "first of its kind" (Sauser et al., 2009), intended to deliver new capacities and/or complex infrastructures. These projects tend to be characterised by large budgets and issues associated with complex systems, such as nonlinearity, irregularity, and uncertainty. Moreover, such complex projects typically attract strong public attention and political interest as a result of substantial social, environmental, national, and even international implications being associated with the success and failure of such enterprises (Whitty and Maylor, 2009).

The performance of these large, complex projects is often disappointing. Many complex projects experience substantial cost overruns and delays in completion, and fail to deliver their objectives (Chang et al., 2013; Eden et al., 2005; Williams and Samset, 2010). For example, the FIFA World Cup 2014 project budget increased from the originally estimated €1 billion to €11 billion. Such failures in complex projects are not unique to sport events. The construction of Denver International Airport exceeded the original budget by 200% and was delivered 16 months over schedule (Flyvbjerg, 2005). Clearly, any research that seeks to improve the record of accomplishment in complex projects merits attention.

Researchers including Dvir et al. (2006) and Sauser et al. (2009) have found that challenges in complex projects are primarily associated with managerial, rather than technical issues.

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In this regard, project management skills and leadership skills may be the most critical determinants of successful project outcomes (Kaulio, 2008; Müller et al., 2012). In developing our central arguments, we note the role of emotion has been highlighted recently as being a central factor in how successful leaders manage on a day-to-day basis (Jordan and Lindebaum, 2015). In order to incorporate emotions as an element in our research we draw on the principles of Affective Events Theory (AET; Weiss and Cropanzano, 1996) in developing a testable model of this process. Within the AET model, events at work result in employee affective reactions that, in turn, determine their subsequent work attitudes and behaviours. As Ashkanasy (2002) has pointed out, the underlying principles of AET enable us to understand the cause and consequence of emotional experience on employee work attitudes and behaviour. In our study we extend this to consider how emotion plays a role in the leadership of complex projects.

Leadership is a crucial part of managing complex projects, impacting directly on successful project outcomes (Shenhar et al., 2002). In this research we specifically focus on leaders' managerial skills and in particular the effect of project managers' emotional intelligence (EI), defined by Mayer et al. (2004) as the ability to be aware of, to utilise, to understand, and to manage emotions in self and others. We justify this approach in the context of project management on the basis of research by Clarke (2010) and Müller and Turner (2007), who identified EI as a key ingredient of effective complex project leadership (see also, Sunindijo et al., 2007; Thomas and Mengel, 2008). In more recent research, Mazur et al. (2014) have argued specifically that high EI project managers are able to solve new challenges and problems as well as to better communicate with their peers.

Although EI has been offered as a solution to resolving some complex project management issues, the underlying mechanisms influencing the EI–project success relationship remain unknown. In this regard, Müller and Jugdev (2012) have suggested that if we are to understand the factors that underlie the success of project outcomes then there is a need for researchers to explore variables that potentially mediate between project manager characteristics (such as EI) and project success.

In particular, in accordance with the principles underlying AET, we argue that job satisfaction and trust resulting from affective experiences may mediate the relationship between EI and project manager behaviours. We argue that emotionally intelligent project managers should be more likely to be satisfied with their jobs and to trust in others (Sy et al., 2006). Subsequently, we consider that higher levels of trust and job satisfaction will, in turn, lead to higher levels of project success in terms of high quality communication, effective troubleshooting, mission clarity, and top management support (Mazur et al., 2014). In this regard, Judge et al. (2001), Pheng and Chuan (2006), and Thompson (2008) found positive relationships between job satisfaction, trust, and project success. We also note that Güleryüz et al. (2008), Sy et al. (2006), and Wong and Law (2002) found that EI is an antecedent to job satisfaction and trust. In our study we extend these findings in an examination of variables in a field-based study within a complex project management organisation. A review of the literature reveals no studies that have tested the mediating relationships linking these variables in the context of a complex project management organisation.

We argue that our study contributes to theory and practice in three ways. First, we develop and empirically test a model of the impact of EI on a sample of managers working on large and complex defence projects. Second, we explore potential mechanisms by which an emotionally intelligent project manager may contribute to project success factors. Third, we add to an increasing body of literature on the emotional, attitudinal, and behavioural implications of EI in complex project management organisations.

2. Critical variables

The critical variables in our study are project managers': ratings of project success factors, EI, job satisfaction, and trust in others. In the following section we introduce these four variables and then describe our study model and hypotheses.

2.1. Project success

Although defining project success in complex projects – where timeframes for completion are long and the size of the projects are substantial – remains a challenging issue (Toor and Ogunlana, 2010; Wang and Huang, 2006), project management scholars generally agree on two components that define project success: *success criteria* and *critical success factors* (Müller and Jugdev, 2012; Turner and Zolin, 2012). *Success criteria* focus on objective measures, such as completion timeliness, quality, and cost (Pinto and Slevin, 1987). Such objective criteria, however, have been criticised, especially in the context of defining complex project success. This is because they tend to draw on overly simplistic constructs which do not mirror the experience in large, complex projects (Toor and Ogunlana, 2010). Moreover, as Jugdev and Müller (2005) have pointed out, such criteria fail to address broader factors that can be considered as success indicators, such as behavioural skills or strategic management objective criteria.

Critical success factors, on the other hand, focus on "soft" issues, such as behavioural skills of project teams as well as customer and stakeholder satisfaction, and therefore represent a more realistic progressive approach to assessing project success (Jugdev and Müller, 2005; Pinto, 1990). Turner and Zolin (2012) have pointed out that success factors, unlike impacts such as time, cost, and quality, can be measured prior to the end of the project. Given the long timeframes for complex projects this type of measurement is useful in assessing a project's progress. We employ Pinto and Slevin's (1987) approach, which uses project managers' ratings of "critical success factors". These are the factors that have been identified by Jugdev and Müller (2005) as the most widely recognised and used measures of success factors.

Taking our lead from Mazur et al. (2014) and Procaccino et al. (2005), we focus on the four project success factors that are regarded as "people related": (a) effective communication with internal and external stakeholders, (b) troubleshooting (i.e., unexpected complications and challenges are effectively

managed as they occur in crisis moments), (c) clear project mission, and (d) top management support (Pinto, 1990).

Researchers have consistently identified these four factors as the keys to project success. For instance, Couillard (1995) identified communication and troubleshooting as indicators of project success in high-risk and complex projects. In the same vein, Belout and Gauvreau (2004) found that troubleshooting and clear project mission objectives contribute to project success in the execution stage. More recently, Davis (2014) and Mazur et al. (2014) specifically identified these four factors as the best indicators of progressive project success, especially in the context of complex project management.

Communication refers to "the provision of an appropriate network and necessary data to all key actors in the project" (Pinto and Slevin, 1989, p. 31). This represents the degree to which project managers are able to communicate effectively with internal and external stakeholders to ensure the best combination of skills and knowledge are available for the project. Communication is an important managerial competency that influences project success.

Troubleshooting refers to being able to "handle unexpected crises and deviations from the plan" (Pinto and Slevin 1989, p. 31). In complex projects, project managers are prone to unexpected problems and challenges due to task interdependency and complexity (Pich et al., 2002; Sun and Meng, 2009). These need to be addressed for the project to be successful.

Mission clarity refers to "initial clarity of goals and general directions" (Pinto and Slevin 1989, p. 31). Complex projects are characterised by high levels of complexity and ambiguity (Dvir et al., 2006). Chang et al. (2013) have pointed out that in large and complex defence projects it is not uncommon for projects to have vague goals, such as "increase defence capability", at the beginning of a long-term project. More specific goals lead to greater project success.

Top management support refers to "willingness of top management to provide the necessary resources and authority/power for project success" (Pinto and Slevin 1989, p. 31). Mazur et al. (2014) have pointed out in particular that top management support is a critical factor across all phases of project planning and execution.

2.2. Emotional intelligence

Salovey and Mayer (1990) define EI as an "ability to monitor one's and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (p. 189). Since it was first put forward, EI has been consistently identified as a key set of managerial skills, which has a significant influence on how managers interact with others. This is particularly the case in the context of high project complexity (Caruso and Salovey, 2004; Clarke, 2010; Joseph and Newman, 2010; Müller and Turner, 2010).

Based on the accumulating evidence that EI is related to managerial effectiveness (O'Boyle et al., 2011), it seems reasonable to conclude that effective project management is not simply determined by technical or hard skills but also by capabilities related to emotions (Fisher, 2011). In the specific

context of project management, research by Mazur et al. (2014) and Müller and Turner (2007) have demonstrated a link between EI as a personal attribute of managers and effectiveness in the context of complex project management. In particular, the results of their research (Mazur et al., 2014; Müller and Turner, 2007) tell us that a project manager's ability to understand and to regulate emotion in self and others produces high quality, effective relationships with both internal and external stakeholders.

2.3. Job satisfaction

Brief (1998) defines job satisfaction as "an attitude toward one's job" (p. 10). As such, job satisfaction encompasses cognitive and affective components. Previous studies (Locke, 1969; Weiss, 2002) have shown that both affective and cognitive components contribute to overall attitude and behaviour.

Scholars have studied job satisfaction as both an independent and a dependent variable (e.g., see Chen et al., 2011; Judge et al., 2005). Job satisfaction as an independent variable has been shown to be associated with a variety of workplace behaviours such as project managers' performance and turnover intention, as well as project success (Bowling, 2007; Judge et al., 2001). For example Parker and Skitmore (2005) found that job satisfaction is a significant predictor of a project manager's turnover intention. Moreover, Pheng and Chuan (2006) found that a project manager's performance is affected by job satisfaction, especially in complex projects.

2.4. Trust

Our final variable is trust, which Rousseau et al. (1998) define as "a psychological state comprising of the intention to accept vulnerability based upon positive expectations of the intentions or behaviours of another" (p. 395). The key elements of this definition are a willingness to accept vulnerability in the relationship and positive expectations about another party under conditions of interdependence and risk (Lewicki et al., 2006). Trust has been found to be a predictor of project performance (Maurer, 2010) and project effectiveness (Diallo and Thuillier, 2005; Kadefors, 2004; Lee-Kelley and Sankey, 2008; Park and Lee, 2014; Webber and Klimoski, 2004), stakeholder satisfaction (Bresnen and Marshall, 2000), creativity and problem solving (Smyth, 2005), knowledge and information disclosure, and project success (Diallo and Thuillier, 2005; Jung and Avolio, 2000; Smyth et al., 2010; Wiewiora et al., 2014).

3. Model and hypotheses development

3.1. Conceptual framework

In Fig. 1 we outline the model we propose for our study. In line with the principles underlying AET (Weiss and Cropanzano, 1996), we have focused on the manner in which an individual's responses to affective experiences at work shape their work attitude and behaviour.

According to Weiss and Cropanzano (1996), attitudes and behaviour at work are influenced by the experience of emotions
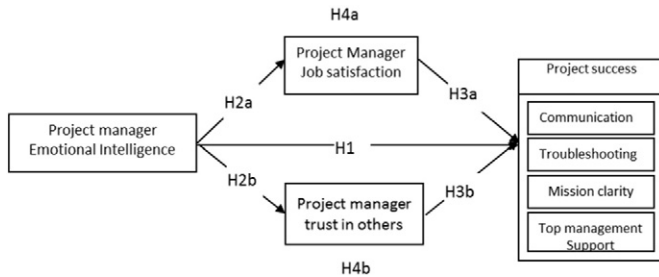
Fig. 1. Conceptual framework.

and feelings such as pride, enthusiasm, anger, shame, guilt, fear, frustration, and envy. These emotions emerge from events that create emotional reactions in the work environment. Research has shown that employees, including organisational top management, experience emotions at work, and a number of studies support the underlying assumptions of AET (Mignonac and Herrbach, 2004; Zhao et al., 2007). For example, Ashton-James and Ashkanasy (2005) argued that there is a strong bond between strategic decision-making processes and the emotions that managers experience in response to workplace events. In the same vein, Pirola-Merlo et al. (2002) used AET in a study of leadership to explain the effect workplace events have on team affective climate and consequently on team performance. Large, complex projects with large budgets are likely to have frequent challenging events which, according to AET, could produce emotional reactions. These reactions may result in both positive and negative emotions for the project managers, team members, contractors, and stakeholders (Lindebaum and Jordan, 2014).

Although we do not set out to test AET per se, our model is based on the underlying principles of AET that attitudes and behaviour at work are derived from emotional reactions to events. Ashkanasy (2002) notes that EI plays a critical role in addressing emotions at work insofar as emotion management abilities help individuals to perceive, understand, and manage their own and other's emotions. As such, EI should serve to shape employees' work attitudes and behaviours in a more positive direction, thus influencing project success. In the present research we focus specifically on two job attitudes that may enhance this relationship: job satisfaction and trust.

3.2. Emotional intelligence and project success

Weiss and Cropanzano (1996) have pointed out that emotional experiences change over time and that work behaviours also fluctuate depending on an employee's flow of emotional experience. In the work environment employees often experience positive or negative emotions (Lindebaum and Jordan, 2014). Positive emotions, in general, are seen to have a positive effect and to enable employees to perform better at work (Mayer et al., 2008; Sy et al., 2006; Wong and Law, 2002), while negative emotions such as frustration, irritation, and anger can reduce enthusiasm which can contribute to a decrease in performance (Fisher, 2003; McColl-Kennedy and Anderson, 2002; Von Glinow et al., 2004).

Emotionally intelligent project managers are more likely to experience and to express their emotions positively (Peslak, 2005). This, in turn, is likely to increase the enthusiasm of project managers, enabling them to communicate effectively towards their team members and to facilitate creativity towards addressing challenging tasks (Carmeli, 2003). Project managers with high EI should therefore be more motivated to have a positive impact on their subordinates and to offer appropriate solutions to solve new problems and challenges that a complex project brings (Mount, 2006).

Indeed, researchers (Clarke, 2010; Mazur et al., 2014; Müller and Turner, 2010) have consistently found that EI is a prerequisite for project success. In particular, Müller and Turner (2007, 2010) found direct evidence that EI increases the chance of project success, especially in highly complex project environments. Thomas and Mengel (2008) found that project managers who score high on EI have the ability to recover quickly from negative emotions and stress in difficult situations. Clarke (2010) also reinforces the importance of EI in project manager effectiveness. He reported that EI acts as an underlying ability that determines the behavioural complexity of project managers in complex project situations. Supporting these findings, Thomas and Mengel (2008) found that a lack of EI results in frustration, stress, and low performance, especially where there is scope for misunderstanding and tensions in complex project settings. Overall, these studies provide compelling evidence for the significant role EI plays in determining project success factors. We therefore hypothesise:

H1. Project managers' EI is positively related to project success.

3.3. Emotional intelligence and work attitudes: trust and job satisfaction

Organisational researchers (Barczak et al., 2010; Christie et al., 2015; Kafetsios and Zampetakis, 2008; Sy et al., 2006) have also consistently reported that EI significantly affects team members' job satisfaction and trust in others. An explanation for this might be found in the evidence that managers with high EI are better than their low EI counterparts at managing the emotional fluctuations employees experience at work and to facilitate positive emotions. Positive emotions have been linked to developing better social relationships and building trust with others (Barczak et al., 2010; Christie et al., 2015), but also in generating higher levels of job satisfaction compared to individuals who experience emotions such as disappointment, depression, and anger (Jordan et al., 2006). In this regard, Dunn and Schweitzer (2005) found that positive emotions increase trust in others, while negative emotions (such as anger) decrease trust. In terms of negative emotions, Boden and Berenbaum (2007) found that lower levels of emotional awareness are associated with higher levels of suspicion and frustration.

Since emotional awareness is a component of EI (Mayer and Salovey, 1997) we argue from these findings that EI should also be related to team members' perceptions of trust in others. Finally, we also note that Sy et al. (2006) and Christie et al.

(2015), who examined the impact of EI on work attitudes and outcomes, also found that perceptions of job satisfaction and trust are directly related to emotional skills. Thus, we next hypothesise:

H2. Project managers' EI is positively related to (a) their job satisfaction and (b) their trust in others.

3.4. Job satisfaction and project success

Weiss and Cropanzano (1996) argued that job satisfaction can increase both the expectancy that an employee's effort will lead to high performance and the belief that sustained effort will lead to desirable behavioural outcomes. In an extension of this idea, Fisher (2003) suggested that when employees are more satisfied with their job, their motivation to contribute to the common interest of the context in which they perform their work also increases. Thus, when project managers are satisfied they tend to seek out social interactions, react more favourably to others, have greater involvement in activities, and communicate more with their stakeholders because they are more likely to view such interactions as rich and rewarding (Schaller and Cialdini, 1990). Moreover, as Cheung et al. (2003) found, satisfied project managers are also more likely to undertake more effective problem resolution (troubleshooting), and to set clear directions and motivate team members to undertake new goals that they have not yet attained (Maylor et al., 2008).

Complementing this evidence, Fisher (2003) reported that low job satisfaction tends to jeopardise project success. This is because managers who are not satisfied are less motivated and consequently put in less effort to achieve project goals. Furthermore, low job satisfaction leads to tasks being carried out less efficiently (Judge et al., 2001). Pheng and Chuan (2006) found further that dissatisfied project managers have less interest in communicating with project partners and are thus less able to align the strategies and management with their firm's objectives. Based on this evidence, we next hypothesise:

H3a. Project managers' job satisfaction is positively related to project success.

3.5. Trust and project success

We argue that work attitudes (e.g., trust) shape the degree to which project managers rate the success or otherwise of their projects. Trust facilitates interactions between project managers and their team members by providing effective horizontal working relationships between individuals, especially where there are uncertainties and ambiguities (as is likely in a complex project). Under conditions of uncertainty and ambiguity, a manager's trust in the other party increases better communication, troubleshooting, and organisational support (Diallo and Thuillier, 2005).

In the specific context of complex project management, communication and cooperation between project managers and their team members become more critical than ever (Cherns and Bryant, 1984; El-Sabaa, 2001; Turner and Müller, 2004). Such

communication and cooperative efforts in turn depend to a large degree upon trust. According to McEvily et al. (2003), belief in the other party is needed by managers to share risks and to contribute resources to jointly develop and deliver the product or services that project managers cannot provide on their own.

Conversely, a lack of trust by project managers towards team members can initiate defensive behaviours and block the flow of information that constitutes effective communication, cooperative relationships, and problem-solving tasks (Colquitt et al., 2007; Mayer and Gavin, 2005; Moe and Šmite, 2008). Atkinson et al. (2006) have shown further that lack of trust can lead to dysfunctional and opportunistic team member behaviours. Such behaviours can result in the project manager focussing on detecting signs of opportunism and poor performance, rather than on positive factors likely to lead to project success. Thus, we now hypothesise:

H3b. There is a positive relationship between project managers' trust in others and project success.

3.6. The mediating role of job satisfaction and trust

In the foregoing discussion we sought to establish relationships between project managers' EI and two key work attitudes – job satisfaction and trust in others (H2) – and the relationship between work attitudes and project success (H3). We now argue that, based upon the principles underlying AET, job satisfaction and trust serve as the attitudinal mediators through which EI contributes to project success.

The first mediating path (via job satisfaction) draws on the impact of EI on project managers' evaluative judgments or positive emotions regarding their job. We argue that project managers who are emotionally intelligent and have high job satisfaction are more likely to encourage effective communication, troubleshooting, and project mission clarity. The second mediating path (trust) highlights trust of another party as a critical foundation to increase project success. Emotionally intelligent managers are likely to know how their team members are feeling or might feel in diverse circumstances and use this information to promote content and productive relationships that lay the foundation for trust (Chun et al., 2010; Mayer et al., 2008). This, in turn, contributes to the exchange of information, open communication, and facilitates the generation of creative ideas in crises moments with the aim of increasing project success (Christie et al., 2015). We therefore finally hypothesise:

H4. Project manager attitudes, namely (a) job satisfaction and (b) trust, mediate the relationship between project managers' EI and project success.

4. Method

4.1. Context

We collected the data for our study as members of a team examining leadership and project effectiveness in an Australian

defence organisation. The organisation has an AU$5 billion operating budget for capital acquisition projects. Within this organisation complex projects are characterised by high project management complexity, high levels of technical complexity, difficult support and commercial arrangements, and a typical lifecycle period of 12 years or more.

4.2. Procedure and sample

Our research model was empirically tested using an online survey. To collect our data we asked the Human Resource Department to make our online survey available to 2500 employees in the organisation, and to invite them to complete the instrumentation. A total of 1582 questionnaires were completed, including managerial (n = 780) and non-managerial respondents, with an overall response rate of 63.2%. Our final data sample for this study consisted of 373 valid responses from project managers. The aim of our research was to investigate the work attitudes of project managers and therefore we excluded non-managerial respondents from our study. Sixty-one of the 373 respondents were female (16.4%) and 85% had a college or university degree.

4.3. Measures

We used published and validated measures of EI, job satisfaction, trust, and project success. All of the measures asked participants to rate each scale item using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

4.3.1. Emotional intelligence

We used a self-report measure of EI that adheres to the Salovey and Mayer (1990) ability definition of EI (Jordan and Lawrence, 2009). The 16-item scale was particularly designed for use in organisations and within a team context, which predominates in the organisation we studied. Using this scale we were able to measure four specific components of EI: (1) awareness of own emotions (sample item: "I can explain the emotions I feel to team members"; (2) awareness of others' emotions (sample item: "I can read my fellow team members' true feelings, even if they try to hide them"); (3) management of own emotions (sample item: "When I am frustrated with fellow team members, I can overcome my frustration"); and (4) management of others' emotions (sample item: "I can get my fellow team members to share my keenness for a project"). The Cronbach alpha reliability for this measure was .88.

4.3.2. Project success

To measure project success we utilised Pinto's (1990) 20-item scale to investigate participants' assessments against four factors: (1) communication (sample item: "Individuals/ groups supplying input have received feedback on the acceptance or rejection of their input"); (2) trouble-shooting (sample item: "Immediate action is taken when problems come to the project team's attention"); (3) mission clarity (sample item: "The basic goals of the project are made clear to the

project team"); and (4) top management support (sample item: "Upper management is responsive to our requests for additional resources, if the need arises". This measure obtained an alpha reliability of .92.

4.3.3. Job satisfaction

To measure job satisfaction we employed a four-item global job satisfaction scale developed by Cammann et al. (1983). A sample item is "I am satisfied with my job". The Cronbach alpha reliability for this measure was .84.

4.3.4. Trust

Finally, we employed the 10-item Behavioural Trust Inventory (BTI) to measure trust (Gillespie, 2012; Lewicki et al., 2006). The BTI has two dimensions: (1) willingness to rely on another's work-related skills, abilities, and knowledge (sample item: "How willing are you to rely on your leader's task-related skills and abilities?"); and (2) willingness to disclose sensitive work or personal information to another (sample item: "Discuss how you honestly feel about your work, even negative feelings and frustration"). The BTI has good psychometric properties and a stable factor structure (Gillespie and Mann, 2004) and in our study this measure had an alpha reliability of .81.

4.4. Analysis

To test our parallel multiple mediator model we employed Structural Equation Modelling (SEM, Jöreskog, 1993). We chose this method for two reasons. First, SEM enables us to study both latent and directly measured variables. The use of latent variables removes the effects of unreliability in mediator variables, and improves the accuracy of the mediated effect measurement. Therefore, the latent variable approach should have a higher statistical power to identify the mediating effect than the traditional regression analysis. Second, SEM software allows users to choose from multiple estimation methods, including ordinary least squares, generalised least squares, maximum likelihood, and asymptotically distribution free methods (Byrne, 2013). Different assumptions must hold for various estimation methods. For example, the generalised least squares method assumes normality of the data, while the bootstrap method does not (Preacher and Hayes, 2008).

4.5. Procedure to test mediation

To test our mediation hypotheses we selected the parallel multiple mediation model (Preacher and Hayes, 2008). We chose this approach for three reasons. First, the likelihood of parameter bias (due to absent variables) in the multiple parallel mediators is minimised in this method. Second, the method allows us to control for multiple mediators. Third, the method controls for potential inter-correlation among the mediators in the multiple mediator model.

As recommended by MacKinnon (2008), we used an extension of the simple mediation model to analyse the multiple mediators in our model. This approach consists of three tests: (1) to see if the independent variable (EI) affects the dependent

variable (project success), (2) to determine whether the independent variable (EI) affects the mediators (job satisfaction and trust), and (3) to see if the mediators (job satisfaction and trust) affect project success when the independent variable (EI) is controlled. According to this model, if job satisfaction and trust completely mediate the relationship between EI and project success the path between them should then become non-significant.

We used AMOS 20® to test the SEM (Byrne, 2013). In particular, AMOS directly produces bootstrapped bias-corrected confidence intervals for indirect effects as well as the maximum likelihood estimation method. Both estimation methods are adopted in this research. We also adopted Preacher and Hayes (2008) recommendation to use a minimum of 5000 resamples for the bootstrap analysis.

5. Results

5.1. Measurement model

As the first stage of our analysis we employed confirmatory factor analysis (CFA) to check the integrity of our measurement models. As can be seen in Table 1, the scales demonstrated better fit as second-order rather than first-order models. We compared two models by testing the difference in chi-square (Breckler, 1990) across the models. In this regard, we found that the second-order model offered a significantly better fit to the data (delta–chi-square = 369.22, df = 1, p < 0.001). As can also be seen in Table 1, the second-order model fit statistics all exceeded accepted minimum thresholds required for good fit (χ^2/df < 2, RMSEA, SRMR < 0.08, IFI, TLI, CFI > 0.9; Hooper et al., 2008).

We next evaluated convergent and discriminant validity. We did so using criteria recommended by Hair et al. (2012), which included the tests: (1) Cronbach's α > 0.70 for all constructs, (2) composite reliability for all constructs > 0.70, and (3) average variance extracted of each construct > 0.50. As can be seen in Table 2, all three criteria were satisfied.

For discriminant validity, and as Hair et al. (2012) recommend, we examined whether the square root of the average variance extracted for each construct was greater than the bivariate correlations between the constructs. As can be seen in the descriptive statistics for our study (Table 3) this criterion was met.

To avoid common method variance (CMV) a number of procedural remedies in designing and administering the questionnaire (e.g. anonymity and mixing the order of the questions) were used (Podsakoff et al., 2012). We also employed statistical remedies suggested by Podsakoff et al. (2012). Herman's one factor test showed that the first factor

Table 2
Convergent validity tests.

Variable	Cronbach's alpha	Composite reliability	Average variance extracted
EI	0.88	0.81	0.52
Job satisfaction	0.84	0.83	0.51
Project success	0.92	0.83	0.62
Trust	0.81	0.86	0.53

accounts for 26% of the total variance. We further examined our model to see if a single, unmeasured, latent method factor was present (Podsakoff et al., 2012). To accomplish this we compared fit statistics between models with and without the latent method variance factor (Richardson et al., 2009). The CMV factor resulted in improved fit ($\Delta\chi^2$ = 150.21, df = 33, p < .001; model with CMV factor: χ^2/df = 1.50, IFI = 0.952, TLI = 0.950, CFI = 0.950, RMSEA = 0.40; model without CMV factor: χ^2/df = 1.68, IFI = 0.946, TLI = 0.940, CFI = 0.946, RMSEA = 0.42). Although these results suggest the influence of CMV is likely to be small, we nonetheless controlled for it by including the CMV factor in our hypothesised model test (Podsakoff et al., 2012).

5.2. Hypothesis tests

We tested our structural model in two stages. In Stage 1 (Model 1) we looked at the relationships between EI and the three variables: job satisfaction, trust in others, and project outcomes. As can be seen in Fig. 2 all three relationships were positive and significant, supporting Hypotheses 1, 2a, and 2b. We further examined the direct effects of job satisfaction and trust on project success. Both variables had positive significant effects on project success (job satisfaction → project success, path = 0.45, p < 0.001; and trust → project success, path = 0.25, p < 0.01), therefore H3a and H3b were supported. The model was unchanged when we controlled for sex, age, and education level.

In Stage 2, in order to identify the multiple mediation effects of job satisfaction and trust, we conducted a comparison between Model 1 (Fig. 2) and Model 2 (Fig. 3), where Model 2 included the links from the mediators (job satisfaction and trust) and the dependent variable. In this stage we determined whether the mediators (job satisfaction and trust) affect project success when the independent variable (EI) is controlled. If job satisfaction and trust completely mediate the relationship between EI and project success, the path between them should then become non-significant.

First, we used the maximum-likelihood method in AMOS, and calculated the significance of a multiple mediation effect in the SEM. As can be seen in Fig. 3, the path in Model 2 from EI to project success became non-significant. This confirms that the effect of EI on project success was completely mediated by both job satisfaction and trust.

We next conducted a complimentary test using the bootstrap method with 5000 samples and a 95% bias-corrected confidence interval (Efron and Tibshirani, 1993). Bootstrapping

Table 1
Goodness-of-fit statistics.

Parameter: model	χ^2/df	p	IFI	TLI	CFI	RMSEA	SRMR
2nd-order	1.653	0.000	0.946	0.940	0.946	0.042	0.067
1st-order	2.237	0.000	0.895	0.885	0.897	0.059	0.077

Table 3
Standard deviation (SD), mean, correlations and discriminate validity.

	Mean	SD	Age	Gender	Education	EI	Job satisfaction	Project success	Trust
Age	3.81	1.81							
Gender	1.84	0.37	0.21 *						
Education	3.97	1.18	−0.12 *	0.06					
EI	5.05	1.01	−0.05	−0.08	0.08	**0.72**			
Job satisfaction	3.60	1.03	0.05	0.01	0.07	0.42 ***	**0.71**		
Project success	5.17	1.27	0.03	0.06	0.03	0.41 ***	0.51 ***	**0.79**	
Trust	5.66	0.98	0.06	0.07	0.02	0.67 ***	0.35 ***	0.38 ***	**0.73**

Figures in bold on the diagonal represent square root of average variance extracted.

  * $p < .05$.

*** $p < .00$.

provides the most powerful and reasonable method of obtaining confidence limits for mediation effects under various conditions (Preacher and Hayes, 2008). As can be seen in Table 4, while the lower bound and upper bounds for the indirect (mediated) variables do not include zero, the direct effect from EI to project success does include zero. These findings confirm support for Hypotheses 3a and 3b (job satisfaction and trust both link to project success), and 4a and 4b (mediation effects).

6. Discussion

Our main motivation in conducting the present study was to examine the underlying mechanisms by which a critical component of project manager skill – EI – is linked to managers' ratings of project success factors in a complex project setting. Our findings demonstrate in particular that, while project managers' EI is positively related to project success (Müller and Turner, 2010), this relationship is complex and cannot be fully explained in terms of a straight-forward direct relationship.

To understand the underlying mechanisms connecting project managers' EI and project success we developed and tested a model that drew on relevant emotions theory (Ashkanasy, 2002; Weiss and Cropanzano, 1996). Using this theoretical framework we argued for the relationship between EI and project success and inferred that this relationship may be mediated by two paths. First, we argued that trust is an attitudinal variable that implies an emotional bond linking EI and project success. As such, emotionally intelligent project managers develop trust with their team by creating an emotional attachment with their team members, and this relationship is then reflected in project success factors, including communication, mission clarity, troubleshooting, and top-management support. Second, the mediating role of

job satisfaction determines the impact of EI on project managers' evaluative judgments regarding their job and is also reflected in their evaluations of project success.

Our findings suggest that the traditional view of the direct effect of EI on project success only tells part of the story. In this sense, our study represents a response to Müller and Jugdev's (2012) call for research to explore mediating variables of project success. To the best of our knowledge, this study is the first to apply AET to study the role of EI in project success. The positive relationship we found between EI, job satisfaction, and trust provides further insights into the relationship between emotionally intelligent project managers' skills and their work attitudes. This positive relationship is also consistent with previous research findings related to EI and work attitudes (Sy et al., 2006, Wong and Law, 2002). Emotionally intelligent managers have the ability to recover quickly from negative emotions and stress in difficult situations (Wong and Law, 2002). In a complex project setting, project managers who are confronted with a difficult situation would be able to regulate their emotions to work towards a productive outcome. The findings of this study help shed light on this critical organisational process that has previously lacked both theoretical and empirical attention. Given that EI and work attitudes have been shown to make a difference in terms of heightened project success, our results may guide new research that aims to capture the potentially business-enhancing effects of combining EI and positive work attitudes in a complex project setting.

Our study also contributes from a methodological perspective, insofar as we examined satisfaction and trust simultaneously, thus reducing a parameter estimate bias issue (Preacher and Hayes, 2008) that would have arisen were we to have examined one mediator at a time.
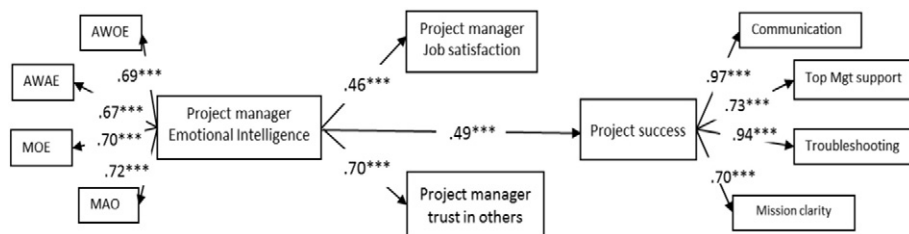

Fig. 2. Model 1 results (AWOE = awareness of own emotions; AWAE = awareness of others' emotions; MOE = management of own emotions; MAO = management of others' emotions).

Fig. 3. Model 2 results (AWOE = awareness of own emotions; AWAE = awareness of others' emotions; MOE = management of own emotions; MAO = management of others' emotions).

6.1. Practical implications

Understanding how EI links to project success has practical implications for project managers, particularly in the areas of recruitment and management development. Our findings suggest that organisations should consider recruiting project managers who have high levels of EI since these managers can be expected to have higher levels of positive work attitudes, such as job satisfaction and trust. In terms of human resource development, emphasis should be given to developing EI in project managers (Clarke, 2010). EI would seem to be a significant factor that plays a key role in social situations, instilling feelings of trust and cooperation with other project teams, particularly in highly stressful work conditions such as complex projects. EI can also be developed through training programmes. Clarke (2010) reported that project managers who received EI training increased positive attitudes and behaviour and decreased conflict; in Clarke's (2010) study the organisation that supported the EI training also exceeded its productivity goals. As a multitude of studies have shown, revenue growth can be increased by improving manager satisfaction and trust (Mohr and Puck, 2007). Positive work attitudes, such as job satisfaction and trust, are enhanced by fostering EI in managers (Carmeli, 2003).

Finally, we note that our findings suggest that top management should be aware of the importance of project managers' job satisfaction and trust, which can both serve to boost project success in complex project situations. As such, enhancing job satisfaction and promoting project managers' trust in their followers should form part of leader development programmes. In this regard, providing appropriate training programmes has been shown to be associated with increased job satisfaction (Harris et al., 2009). Design of project rewards or empowerment is another strategy that increases the development of trust between two parties in projects which lead to revenue growth (Mohr and Puck, 2007).

6.2. Limitations and future directions

We acknowledge three limitations to our study that suggest potential fruitful opportunities for future research. First, we acknowledge that the generalisability of results may be limited because our data were collected from a defence organisation in the one country: Australia. In this case, it might be useful to see if our findings replicate in other national settings. Second, while we justified two particular mediators (job satisfaction and trust) of the EI–project success relationship, we also acknowledge that additional mechanisms might exist through which EI may impact on project success. Future research might therefore consider other mechanisms, such as work environment characteristics and personal dispositions. Finally, we point out that we focused on a managerial sample; in this regard, researchers in the future might wish to examine the role of EI among non-managerial employees and its impact on project success.

Conflict of interest

The authors declared that they have no conflict of interest.

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Table 4
Bias-corrected bootstrap results.

		Confidence limits		
	Parameters	Lower	Upper	p-Value
EI	→Job satisfaction	.455	.927	.000
EI	→Trust	.261	.554	.000
EI	→Project success	−1.200	.526	.874
Job satisfaction	→Project success	.351	.697	.000
Trust	→Project success	.226	.812	.027

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