

# **The Influence of Project Personnel's Emotional Intelligence, Interpersonal Skill, and Transformational Leadership on Construction Safety Climate Development**

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# **The Influence of Project Personnel's Emotional Intelligence, Interpersonal Skill, and Transformational Leadership on Construction Safety Climate Development**

## **Abstract:**

Project personnel play an important role in construction safety management which requires them to have relevant capabilities. Research has shown that emotional intelligence, interpersonal skill, and transformational leadership are competences that generate superior performance in today's workplace. The aim of this research is to investigate the influence of project personnel's emotional intelligence, interpersonal skill, and transformational leadership on the implementation of safety management tasks and the development of construction safety climate. Structural equation modelling (SEM) was applied to analyse 273 valid responses collected via an online survey. The results indicate that emotional intelligence is a key factor for developing interpersonal skill and transformational leadership. Emotional intelligence also has positive influence on the implementation of safety management tasks which can lead to the development of construction safety climate. In addition, interpersonal skill is crucial to develop transformational leadership, which in turn, contributes to the development of construction safety climate. The implication of this research is that in order to improve safety performance, construction companies should consider the relationships among various aspects discussed in this research and incorporate them into their human resource development program.

**Keywords:** construction safety climate; emotional intelligence; interpersonal skill; safety management tasks; transformational leadership

## **1. Introduction**

Statistics show that safety performance (based on numbers of accidents and fatalities) in the construction industry has remained roughly the same since the early 1990s (Holt, 2005; López et al., 2008). Modern technology, automation, and safety management system are not enough to further improve safety performance. Reason (1990) argued that safety improvement can only be achieved through an attention to human error mechanism. This human factor is particularly important in the construction industry due to its labour-intensive characteristic (Lingard and Rowlinson, 2005). Consequently, safety research and safety management implementation need to focus on the human side of safety to promote further safety improvement (Sunindijo and Zou, 2009).

Project personnel play an important role in construction safety management. They are responsible to perform certain safety management tasks to lead safety implementation in their projects (Dingsdag et al., 2006). Sunindijo and Zou (2009) suggested that performing these safety management tasks proficiently is crucial for developing

construction safety climate. This role of project personnel in performing safety management tasks and developing construction safety climate, has not been investigated. Therefore, the research aims to fill this research gap.

Project personnel need to have capabilities to meet their responsibilities. Research has shown that emotional intelligence, interpersonal skill, and transformational leadership are essential in today's workplaces (Bass and Riggio, 2006; Goleman, 1998; Goleman, 2001; Janasz et al., 2006; Robbins et al., 2009; Robbins and Hunsaker, 2009; Strohmeier, 1992). Emotional intelligence is "the capacity for recognising our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships". It has been closely associated to superior performance (Goleman, 1998, p.317), thus it is argued that emotional intelligence should also influence the efficacy of project personnel in performing their safety management tasks. Furthermore, many of the safety management tasks require project personnel to work with others. Therefore, project personnel need interpersonal skill to interact effectively during the implementation of safety management tasks (Strohmeier, 1992). Lastly, project personnel also have a safety leadership role in implementing safety management tasks and developing construction safety climate (Dingsdag et al., 2006; Sunindijo and Zou, 2009). Transformational leadership is widely considered as a leadership style that produces higher levels of employees' effort and performance than the traditional leadership styles (Robbins et al., 2009).

To sum up, the objectives of this research are twofold. First, the influence of emotional intelligence, interpersonal skill, and transformational leadership on the implementation of safety management tasks and the level of construction safety climate is explored. The second objective is to reveal the interrelationships between emotional intelligence, interpersonal skill, and transformational leadership, which can serve as guideline or an approach for improving project personnel's capabilities.

## **2. Research model and hypotheses**

Safety climate is "shared employee perceptions of how safety management is being operationalised in the workplace, at a particular moment in time" (Cooper and Phillips, 2004, p. 497). Safety climate was chosen as an indicator of safety performance in this research because of its many advantages: (1) it is a leading indicator that can identify safety problems before they manifest into accidents and injuries, (2) it provides a mechanism to optimise investment on safety-related improvements, (3) it serves as a valuable tool to identify safety trends and establish benchmarks, (4) a safety climate survey costs less money and time to be carried out, (5) it involves employees in the process, which helps identify key issues that need to be addressed, and (6) many studies have revealed the importance of safety climate in predicting or measuring safety-related outcomes (Davies et al. 2001; Glendon and Litherland, 2001; Seo et al. 2004).

Top management should be the first one who initiates safety implementation and develop safety climate in the organisation. However, top management should not be the only one

responsible for safety. Every employee must participate and be accountable. The commitment of top management is obviously critical, but commitment alone is insufficient. There must be some clear processes or tasks to implement safety and develop safety climate. Dingsdag et al. (2006) have identified 39 safety management tasks that project personnel should perform for this purpose. A safety management task is a definable activity, action, or process that project personnel need to perform to provide safety leadership. In other words, these tasks are what project personnel should do to lead safety implementation and promote the development of construction safety climate in their project.

As stated earlier, emotional intelligence, interpersonal skill, and transformational leadership have been considered as essential capabilities in today's workplaces. Therefore, this research investigates their roles on implementation of safety management tasks and development of construction safety climate. The research model, as illustrated in Figure 1, integrates all the aspects discussed here. Emotional intelligence is the initiator signifying that project personnel should start inwardly by understanding and managing emotions (both self and others). Then emotional intelligence is manifested in effective interactions through the application of interpersonal skill. By means of effective interactions, project personnel can become transformational leaders who generate superior performance from their teams (Goleman, 1998; Robbins and Hunsaker, 2009; Sunindijo et al., 2007). It is argued that the three capabilities are required by project personnel to perform well during the implementation of safety management tasks. Finally, successful implementation of safety management tasks leads to the development of construction safety climate which serves as the safety goal in this research. Based on this research model, seven hypotheses were formulated as follow:

*Hypothesis 1: The higher the emotional intelligence, the higher the interpersonal skill.*

*Hypothesis 2: The higher the interpersonal skill, the higher the transformational leadership.*

*Hypothesis 3: The higher the emotional intelligence, the higher the transformational leadership.*

*Hypothesis 4: Emotional intelligence has positive influence on the implementation of safety management tasks.*

*Hypothesis 5: Interpersonal skill positively affects the implementation of safety management tasks.*

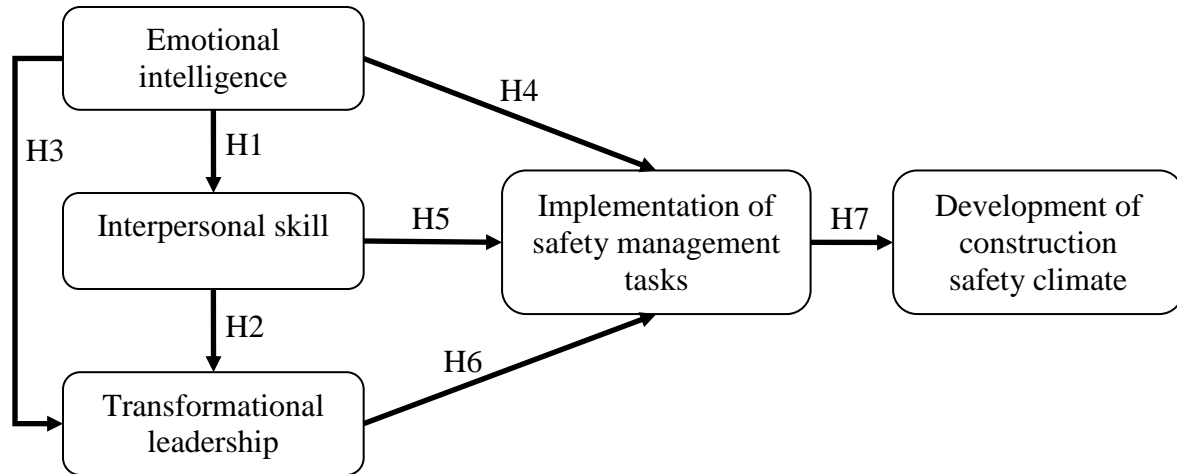
*Hypothesis 6: The higher the transformational leadership, the higher the implementation of safety management tasks.*

*Hypothesis 7: Implementation of safety management tasks influences the development of construction safety climate.*

### **3. Research Methods**

A quantitative research method was chosen to test the hypotheses because the main aim of the research is theory testing which involves determining the degree of relationships

among measured variables. Since a large sample of quantitative data is required to test the theory, questionnaire survey is the most appropriate data collection method to achieve this purpose. Furthermore, questionnaire survey is easy to be conducted, inexpensive, and suitable for measuring unobservable constructs (Tharenou et al., 2007).



**Figure 1** Theoretical research model

The questionnaire for this research was divided into five sections. The first section is the 28-item Emotional Intelligence Appraisal which has been validated across various industries and job positions. It was designed to assess four dimensions of emotional intelligence, namely, self-awareness, self-management, social awareness, and relationship management (Bradberry and Greaves, 2001-2010). The second section assesses the interpersonal skill of project personnel, particularly their communication, motivation, conflict resolution, and teamwork development competencies. It contains 15 items and was developed based on previous studies (Carlopio and Andrewartha, 2008; Culp and Smith, 1992; Robbins et al., 2009; Strohmeier, 1992). The third section is the Global Transformational Leadership (GTL) scale, which contains seven items. The GTL has been tested in Australia with satisfactory reliability and validity to measure transformational leadership (Carless et al., 2000).

The fourth section assesses the level of implementation of safety management tasks. It was developed based on 39 safety management tasks identified by Dingsdag et al. (2006). The fifth section for assessing construction safety climate was developed based on the review of several previous safety climate studies (Brown and Holmes, 1986; Cox and Cheyne, 2000; Dedobbeleer and Béland, 1991; Glendon and Litherland, 2001; Lin et al., 2008; Mohamed, 2002; Williamson et al., 1997; Zhou et al., 2009; Zohar, 1980; Zohar and Luria, 2005; Zou and Sunindijo, 2010). All questionnaires are self-assessed and use a six-point Likert scale response format for Emotional Intelligence Appraisal and five-point Likert scale response format for other sections.

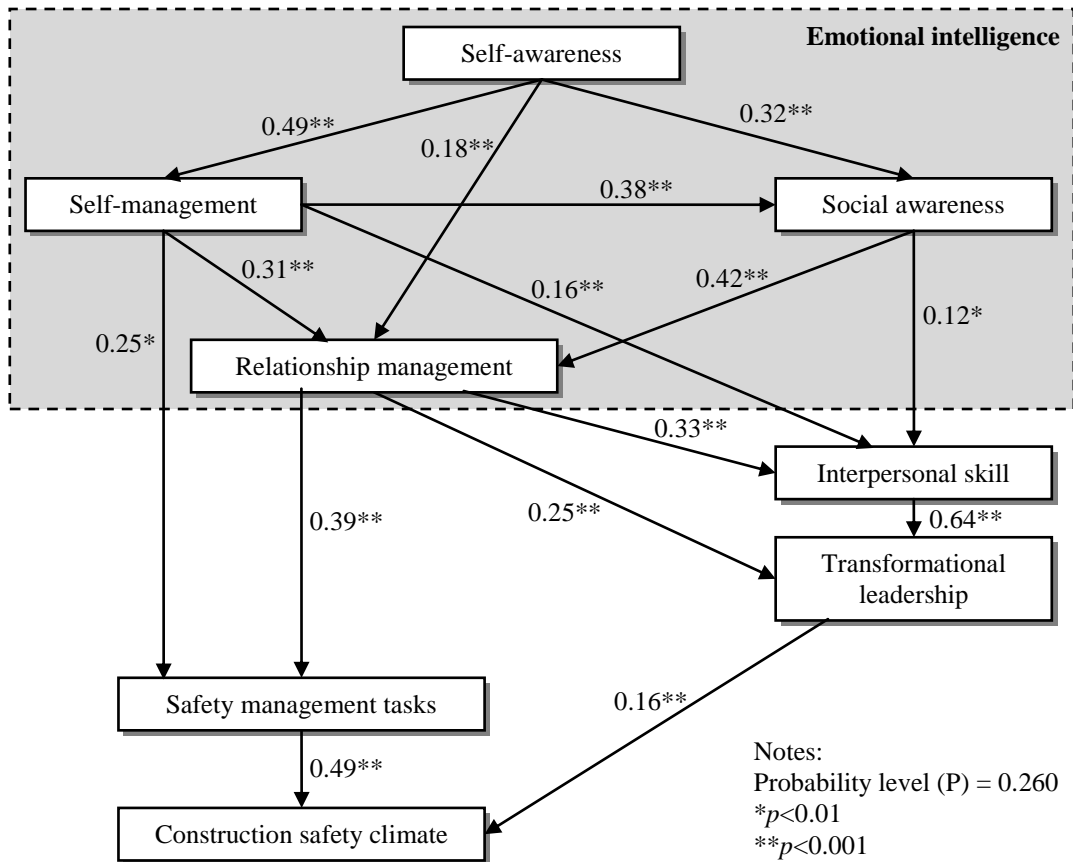
Data were collected using a web-based survey from construction companies. Prior to the distribution of the questionnaires, the researchers met with safety managers of the companies to explain the aims and benefits of the research. Project personnel who were

working in construction projects at the time of the survey were invited to respond to the survey. The safety managers provided valuable support by distributing the web survey links to their colleagues and subordinates. In addition, they sent reminders periodically to encourage more responses.

Structural equation modelling (SEM) was the main method applied to test the hypotheses of this research. SEM is suitable because it provides a quantitative test of a theoretical model so that complex relationships among constructs or variables can be understood (Schumacker and Lomax, 2010). AMOS 18 (analysis of moment structures version 18) developed by SPSS Inc. was the SEM software package used in this research.

#### **4. Data Analysis and Discussion**

There were 356 respondents participated in the survey in which 273 were valid and analysed further. Various project personnel have participated ranging from safety personnel, site supervisors, engineers, site managers, project managers, and construction managers. The result of the SEM analysis is presented in Figure 2. The probability value of the chi-square test is higher than 0.05 ( $P=0.260$ ) indicating that the model fits the data. All [unstandardised regression] coefficients are statistically significant providing strong support for the hypothesised model.



**Figure 2:** Final model of the SEM analysis

### The interrelationships among the four dimensions of emotional intelligence

Self-awareness is a prerequisite of the other three dimensions and also the dimension that starts all relationships in the model. Research showed that people with high self-awareness understand their strengths and limitations, a competency prominent among best performing managers. Self-awareness also makes people search for feedback, learn from their mistakes, and understand when to work with others who have complementary strengths. It often leads to greater understanding of others, thus people high in self-awareness appear trustworthy and perceived as being more competent (Janasz et al., 2006). Furthermore, self-awareness leads to the development of self-confidence, which is a significant predictor of performance (Goleman, 2001). The finding of this research supports a proposition indicating that self-awareness is the core of emotional intelligence (Jordan and Ashkanasy, 2006) as well as a key to succeed and work effectively with others (Janasz et al., 2006).

Self-management is the predictor of social awareness and relationship management. The relationships are obvious since people who cannot control their emotional outbursts will have less chance to be effective in understanding others and developing relationships (Goleman, 2001). At a neurological level, it has been found that self-management is the foundation for social effectiveness (Damasio, 1994). Lastly, social awareness is also a predictor of relationship management. Lane (2000) found that understanding of own

emotions and the emotions of others is a way to create effective social interactions. People with high social awareness can understand different points of view, thus they can interact effectively with different types of people. It is easier for them to get along in organisational life, build networks, and employ influence tactics to achieve positive results (Robbins and Hunsaker, 2009).

### **Emotional intelligence and interpersonal skill**

Interpersonal skill refers to the ease and comfort of interactions between project personnel and other project stakeholders. Motivating people, resolving conflicts, communicating effectively, and building teamwork are interpersonal issues that require the attention of project personnel (Strohmeier, 1992; Sunindijo and Zou, 2010a). The model in Figure 2 shows that emotional intelligence, particularly self-management, social awareness, and relationship management, is the prerequisite of effective interpersonal skill.

It is important to be effective self-managers before project personnel can overcome barriers to interpersonal effectiveness and become effective role models. The ability to manage oneself gives project personnel credibility in their interactions with others. This credibility and the capacity to manage emotional outbursts are keys to effective communication, which is a foundation to resolve conflicts and build teamwork (Janasz et al., 2006). Furthermore, self-management is the source of achievement drive (an optimistic striving to improve performance) and initiative (proactive in seizing opportunities and pursuing goals beyond what is required) which are crucial to motivate oneself and others (Goleman, 1998).

A study (Sunindijo et al., 2007) indicated that social awareness is related to sharing and open communication. This sensitivity to others is critical for superior job performance whenever the focus is on interactions with people (Robbins and Hunsaker, 2009). Goleman (2001) suggested that relationship management dimension can be used to develop, coach, mentor, and persuade others to achieve common goals. It is a source of effective communication and conflict management as well as needed in networking, collaboration, and teamwork. People high in relationship management use their understanding of emotions to inspire change and lead people towards something better, to build teamwork, and to resolve conflicts as they arise (Robbins and Hunsaker, 2009). In overall, this finding confirms Hypothesis 1 concerning the positive relationship between emotional intelligence and interpersonal skill.

### **Emotional intelligence, interpersonal skill, and transformational leadership**

Transformational leadership is seen as an effective leadership style by subordinates and superiors. The SEM analysis shows that relationship management and interpersonal skill are the predictors of transformational leadership. The relationship between interpersonal skill and transformational leadership is clear and expected as included in Hypothesis 2. Transformational leaders have to exercise their interpersonal skill to interact effectively with others. There is no leadership without these interactions. Consequently, people need



to understand how to communicate, motivate, resolve conflicts, and build teamwork before they can be effective leaders. Goleman (2001) suggested that people high in relationship management can sense people's developmental needs which make them excellent coaches and mentors. They are influential and articulate a shared vision that arouses enthusiasm and inspires others to work together towards common goals. They are also change catalysts which bring greater efforts and better performance from their subordinates. In short, relationship management generates competencies required by transformational leaders. This finding confirms Hypothesis 3 in this research.

### **Emotional intelligence and safety management tasks**

The model also provides support to Hypothesis 4 by indicating that two dimensions of emotional intelligence, i.e., self-management and relationship management, are required to perform safety management tasks. Self-management is a form of self-leadership where people need to influence themselves to achieve their goals (Robbins and Hunsaker, 2009). In practising self-management, project personnel should include safety as one of their values and goals. This will influence project personnel's decisions and behaviour, thus they will be motivated in performing their safety management tasks.

The role of relationship management dimension is also critical in the implementation of safety management tasks. Nearly all safety management tasks require project personnel to develop relationships with other project stakeholders. Consequently, relationship management is needed to connect with others in ways that build positive relationships (Robbins and Hunsaker, 2009), thus project personnel can perform and lead the implementation of safety management tasks effectively.

The model, however, does not support Hypotheses 5 and 6. Interpersonal skill and transformational leadership have no influence on the implementation of safety management tasks. This may be due to the fact that safety management tasks are activities that should be performed by project personnel themselves, thus "internal" capability like emotional intelligence is more important than "external" capability like interpersonal skill and transformational leadership.

### **Safety management tasks and construction safety climate**

The implementation of safety management tasks and transformational leadership are the predictors of construction safety climate. The positive relationship between safety management tasks and construction safety climate was expected and consistent with the theory used to develop the original research model. Accordingly, the result supports Hypothesis 7 in this research and confirms the value of safety management tasks in developing construction safety climate.

Transformational leadership is required to develop construction safety climate because it helps build commitment towards safety. Project personnel should become role models to build this safety commitment. They need to inspire others by articulating a clear vision and showing the moral values involved in safety implementation, thus increasing the

intrinsic value of achieving safety goals. This charismatic approach should be supported by necessary training and mentoring to provide others with a sense of increased competence to carry out safety duties. This creates more satisfied followers, while simultaneously promotes positive perceptions and attitudes towards safety which basically refer to construction safety climate (Bass and Riggio, 2006).

## **5. Conclusions**

The results of this research indicate that project personnel can use emotional intelligence, interpersonal skill, and transformational leadership, to implement safety management tasks and develop construction safety climate. Emotional intelligence, particularly self-awareness, is a core factor that contributes to improvement of individual performance and development of effective relationships with others. Project personnel can manifest their emotional intelligence in their interpersonal relationships through exercising their interpersonal skill, such as communicating effectively, motivating others, resolving conflicts, and building teamwork. Effective interpersonal relationships are needed for project personnel to become transformational leaders who inspire their teams to generate superior performance. This development process leads to effective implementation of safety management tasks which will promote positive construction safety climate.

Construction companies should recognise the role of these capabilities in construction safety by providing relevant training and development strategies for their project personnel. They can integrate emotional intelligence measurement in their recruitment procedures to employ the right individuals that can contribute to safety improvement and organisational success in general. Interpersonal skill and leadership development are other aspects that may require more attention, especially concerning their potential influence on construction safety. Safety management tasks should also be enforced in every construction company to promote construction safety climate development and safety performance improvement.

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