

# SETTING THE STAGE FOR EFFECTIVE SAFETY LEADERSHIP IN CONSTRUCTION: THE ANTECEDENTS OF SAFETY-SPECIFIC TRANSFORMATIONAL LEADERSHIP BEHAVIOURS

Clara Man Cheung<sup>1</sup> and Cui Qingbin

*Department of Civil & Environmental Engineering, University of Maryland, 1173 Glenn L. Martin Hall, 4298 Campus Drive, College Park, MD 20742, USA*

Representing about 30% of all fatal injuries in the United States in the past decade, the construction industry is notorious for its poor safety performance. Research suggested that a strong predictor of safety performance is safety leadership. Specifically, safety-specific transformational leadership behaviours (SSTLBs) was found to be the most predictable factor of safety outcomes. However, there has been scant attention paid to how organizational context and personal factors could facilitate construction leaders to engage in SSTLBs. Consequently, it is currently unclear how to develop a supportive environment and effective training programs to help the application of SSTLBs. To narrow such a knowledge gap, this study proposed a conceptual model to study the issue based on the framework of the job demands-resources (JD-R) model in positive psychology. Specifically, we examine how personal resources (psychological capital), job resources (social support and work autonomy), and job demands (risks and hazards) could affect leaders' work engagement in SSTLBs. Following the predictions of the JD-R model, we expect that the relationship between job resources and SSTLBs will be moderated by personal resources, job demands, and work engagement. The implications of the proposed conceptual framework for future research are discussed.

Keywords: job demands-resources model, positive organisational behaviour, safety leadership, safety performance, work engagement

## INTRODUCTION

According to the Occupational Safety and Health Administration (OSHA), about 30% of occupational fatalities in the United States constantly occurred in the construction industry over the past decade. This poor performance has sparked an interest in studying how to improve construction safety. Over recent years, a number of studies have pointed out that safety climate is a strong predictor of safety performance (e.g., Clarke, 2006; Zohar, 2010), on the one hand; on the other hand, research consistently revealed that leadership is a critical factor of safety climate. For instance, in a review of two decades of research on safety climate, Flin *et al.* (2000) found that 72% of the literature concluded that leadership was central to cultivate safety climate because leaders' day-to-day behaviours reflect their priority on safety, and employees can interpret those behaviours to generate norms and perceptions on how they should handle safety at work (Zohar and Tenne-Gazit, 2008).

---

<sup>1</sup> clara524@gmail.com

As leadership was found to closely be associated with safety climate and safety outcomes, a sizeable body of research has focused on uncovering what leadership styles and behaviours are important for driving such relationships. In particular, transactional and transformational leadership are the most frequently studied styles among those publications. Transactional leadership style refers to employing rewards and punishment for motivating followers while transformational leadership style refers to using influencing power and enthusiasm to motivate followers to work for the benefit of an organization (Bass, 1990). Indeed, scholars such as Barling *et al.* (2002), and Inness *et al.* (2010) found that transformational leadership behaviours predicted safety performance. In the same vein, Clarke (2013) concluded that both transformational and transactional leadership influence employees' safety behaviours across different organizational settings. Furthermore, Hoffmeister *et al.* (2014) found that transformational leadership was a more predictable factor of safety outcomes than transactional leadership in construction work.

Although the existing studies did provide us with a good understanding that transformational leadership or, more accurately, safety-specific transformational leadership behaviours (SSTLBs) have a positive and stronger effect on improving construction safety, little is known about the antecedents or factors that affect leaders' engagement in SSTLBs. Briefly defined, 'engagement' or 'work engagement' is the psychological state to which leaders show energy, enthusiasm, feel a sense of inspiration, and are fully concentrated (Schaufeli *et al.*, 2002) in demonstrating SSTLBs. In addition, 'safety-specific transformational leadership behaviours' refer to transformational leadership behaviours that specifically promote and develop a safe work environment (Barling *et al.*, 2002). Nevertheless, research in non-safety domains has shown that organizational context and personal factors are important antecedents of engagement in leadership (e.g., Barling *et al.*, 2000). Therefore, it is quite possible that different contextual and personal factors may affect leaders' engagement in SSTLBs in different ways and for different reasons. We use the term 'leaders' to stand for both top management and front-line supervisors who indirectly and directly manage construction projects.

In fact, understanding the antecedents that promote SSTLBs is important because by knowing the personal factors and organisational context that support leaders' engagement in SSTLBs, we can develop better interventions to target resources toward enhancing the contributing factors. Against this background, our study focuses on developing a conceptual framework to examine what and how contextual and personal factors could influence leaders' engagement in SSTLBs. Specifically, we will start by briefly reviewing how work engagement can be seen as an antecedent for SSTLBs and then move to discuss what and how contextual and personal factors could affect leader's engagement in SSTLBs by using the job demands-resource (JD-R) model (Demerouti *et al.*, 2001). We conclude with implications for future research.

### **Work engagement as an antecedent of safety-specific transformational Leadership Behaviours (SSTLBs)**

#### *Work engagement*

A recent review of Simpson (2009) provided us with various definitions of engagement. In this study, we use Schaufeli and Bakker's (2004, 2010) widely used definition. Accordingly, work engagement is a psychological state that captures a positive, fulfilling, and work-related state of mind. In particular, it is characterized by

vigor, dedication, and absorption. 'Vigor' refers to having high energy levels and mental resilience during work, being willing to put effort in one's work, and staying persistent even in adverse situation; 'dedication' is characterized by having a strong involvement in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride and challenge; and 'absorption' refers to being fully concentrated and happily engrossed in one's work while time passes quickly, and one has difficulties to detach oneself from work.

#### *Safety-specific transformational leadership behaviours (SSTLBs)*

Safety-specific transformational leadership behaviours (SSTLBs) refer to transformational leadership behaviours that specifically promote and develop a safe work environment (Barling *et al.*, 2002). SSTLBs are categorized into the same four components as transformational leadership behaviours are, namely: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1990). Specifically, in the context of SSTLBs, 'idealized influence' could be demonstrated when leaders communicate a vision of workplace safety and become role models to promote work safety. For example, leaders do not drive profit and performance at the expense of safe work practices; leaders could show 'inspirational motivation' when they challenge individuals to achieve higher safety standards that exceed minimum safety requirements; 'intellectual stimulation' could be shown when leaders challenge employees to evaluate existing safety practices and develop innovative and improve practices for solving safety-related matters, and leaders could demonstrate 'individualized consideration' for employees by showing their personal concern for the safety and well-being of employees.

#### *Work engagement and SSTLBs*

This study considers work engagement as an antecedent of SSTLBs. As mentioned earlier, transformational leaders use influencing power and enthusiasm to enhance followers' commitment and involvement to the safety goals of the organisation, and motivate followers to perform above and beyond the required safety standard. According to Bass (1990), transformational leaders recruit and engage their followers by using role modelling. In a nutshell, a leader's behaviours show to his followers what kind of safety values and behaviours are legitimate to develop and, thus, followers can model those values and behaviours to deliver better safety outcomes. In psychology theories, one's psychological state directly causes behaviours. In other words, behaviours can be explained by citing the psychological state that gives rise to them: a person behaves in a certain way "because he/she was angry" or "because he/she was happy." Specifically, work engagement is a psychological state, which includes vigor, dedication, and absorption as defined in the earlier section, leads to SSTLBs. Based on the theoretical background, we can probably infer that a leader with high work engagement is more likely to demonstrate SSTLBs. Indeed, our proposition is indirectly supported by the study from Bakker and Xanthopoulou (2013) in which they found that work engagement is an antecedent of charismatic leadership behaviours. Charismatic leadership is generally regarded as highly correlated with transformational leadership (Bass and Avolio, 1993; Conger and Kanungo, 1998), the general form of SSTLBs.

#### **The contextual and personal factors that support leaders' engagement in SSTLBs: Job Demand-Resource (JD-R) model perspectives**

After establishing the proposition that work engagement is an antecedent of SSTLBs in the previous section, we explore what and how contextual and personal factors

could possibly influence leaders' engagement in SSTLBs in this section. To do so, we used the job demand-resources (JD-R) model as the framework for our conceptual model because the JD-R model offers the mechanisms on how contextual and personal factors could relate to work engagement, and then lead to SSTLBs.

#### *Job demand-resource (JD-R) model*

The JD-R model was grounded in positive psychology theories and first introduced by Demerouti and her colleagues in 2001 as a model to predict work engagement and its related outcomes. Since then, it has been widely used in studies on engagement as the theoretical framework more than any other theory or model (Hakanen and Roodt, 2010). Overall, the JD-R model consists of three components as the antecedents of work engagement and its work outcomes: job demands, job resources, and personal resources. In particular, job demands and job resources are contextual factors or working conditions that can be found in every organisation (Schaufeli *et al.*, 2009). Job demands could deplete one's energy and consequently engagement while job resources facilitate one's engagement in the desired outcomes. In addition, personal resources in the JD-R model can be defined as personal factors that help individuals control and impact their environment successfully (Xanthopoulou *et al.*, 2007). In addition, personal resources have a positive association with work engagement in general. In the following sub-sessions, we further define job demands, job resources, and personal resources in detail, and explain what specific factors under each component we propose to study in our conceptual model.

#### *Job demands - risk perception*

Job demands are contextual factors including the physical, psychological, social, or organisational dimensions of the job that potentially impose strain if they go beyond employee's adaptive capability, causing depletion of one's work engagement. Therefore, it is associated with physiological and/or psychological costs. Examples of job demands include high work pressure, destruction work environment, and emotionally demanding interactions (Bakker and Demerouti, 2007).

In the conceptual model, we propose to look into risk perception as a variable under job demands because it constitutes the environmental and workplace conditions in the context of safety. Our definition of perceived risk is consistent with previous work that has defined it in terms of (1) the leader's labelling of situations, (2) probabilistic estimates of the extend and controllability of risk of risks, and (3) confidence in those estimates (e.g., Jackson and Dutton, 1988 and Sitkin and Pablo, 1992). Although there is limited research on studying how an individual's risk perception could affect his or her leadership behaviours in safety context, the impact of risk perception on leadership behaviours has been widely studied in non-safety context. For instance, Bazerman and Moore (2008), Roll (1986) and Slovic (1972) found that a decision maker's level of risk perception is related to his or her exhibiting unwarranted confident in their judgements.

Meanwhile, much of safety studies on risk perception have focused on the relationships between risk perception and safety work behaviours, and contradictory results were found. For example, Rundmo (1996) found that there is a negative correlation between workers' risk perception and risk behaviours in the oil and gas industry. Arezes and Miguel (2008) got a similar result. They found that workers who perceived high risk levels on noise exposure were more likely to use hearing protection devices. On the contrary, Nahrgang *et al.*, (2011) concluded that the increase in risk perception led to the increase in job stress, and thus negatively

impacted on an employees' engagement in safety activities, compliance, and job satisfaction. DeJoy *et al.*, (2004) and Nielsen *et al.*, (2011) shared a similar research finding. Indeed, according to the Yerkes-Dodson's law developed in 1908, people need a certain level of job stress in order to choose the right behaviours for driving positive work performance. However, when people get too much stress, they become disengaged and thus lead to negative work performance.

Based on previous studies and the Yerkes-Dodson's law, we expect that the relationship between risk perception and the engagement of safety leadership behaviours is not in a linear relationship, but in a curvilinear relationship. It means that the increase of risk perception leads to the increase of practising SSTLBs up to a certain point, after which, as risk perception continue to increase, the practice of SSTLBs decreases due to a high level of stress.

*Job Resources: work autonomy and social support*

Job resources include physical, psychological, social or organisational aspects of the job that help employees achieve work goals, reduce job demands and the associated physiological and psychological costs, and/or stimulate personal growth and development. Examples include work autonomy, co-worker support, and feedback.

In the conceptual model, we propose to study work autonomy and social support as the variables under job resources. In fact, Conchie *et al.*, (2013) used a focus group method to explore the contextual factors that construction supervisors perceived as being helpful to their engagement in safety leadership behaviours. They found that work autonomy and social support have a positive impact on leaders' engagement in safety leadership behaviours. By studying these two variables in our model again, we are going to empirically validate their findings, and take a step forward by focusing on SSTLBs.

Work autonomy refers to the extent of feeling in control to choose the ways individuals work on their jobs (Breugh, 1999). It promotes work engagement because it encourages ownership for behaviour, feeling of subjective competence and a sense of feeling related to their jobs (Deci and Ryan, 1985). Moreover, previous studies have found autonomy help to promote safety in general. For example, Grote (2007) proposed that autonomy has the strongest impact on safety when desired behaviours are not rule-based and when there is a high level of uncertainty.

As for social support, it can come from the organisation (Mearns and Reader, 2008), supervisors or co-workers (Turner *et al.*, 2010). In fact, Nahrgang *et al.*, (2011) reported that social support is the single most consistent resource that positively influences engagement in safety across different industries. Based on the previous work, we expect work autonomy and social support could be positively related to one's work engagement in SSTLBs.

*Personal resources - Psychological Capital (PsyCap)*

Personal resources are personal factors. They refer to individuals' ability to control and impact on their environment successfully (Xanthopoulou *et al.*, 2007). Personal resources generally can help individuals adapt to different work situations to achieve better work performance. Although individuals' adaptation to environment is different, depending on their levels of personal resources, these resource levels are cultivated by environmental factors. In other words, it is proposed that personal resources may function either as moderators or as mediators in the relationship between job resources and work engagement. Examples of personal resources include

self-efficacy, self-esteem, and optimism (Lorente, *et al.*, 2014; Xanthopoulou *et al.*, 2007; 2009a, 2009b).

In the conceptual model, we propose to use psychological capital (PsyCap) as a variable under personal resources. PsyCap is a higher-order construct that consists of self-efficacy, hope, resilience, and optimism. We choose to test PsyCap in our model because substantial empirical research has indicated that PsyCap has significant positive relationships with desirable employee attitudes and behaviours (e.g., job satisfaction, organisational commitments, psychological well-being, and organisational citizenship) (Avey, Reichard, Luthans, and Mhatre, 2011; Larson and Luthans, 2006; Peterson, 2011; Qadeer and Jaffery, 2014). More importantly, Sweetman and Luthans (2010) proposed a sound and detailed conceptual link between PsyCap and work engagement.

Specifically, PsyCap has emerged as a core construct of positive organisational behaviour (POB) in positive psychology. It is a higher-order constellation of four positive psychological constructs: self-efficacy ('having confidence to take on and put it in the necessary effort to succeed at challenging tasks'); hope ('persevering towards goals and when necessary redirecting paths to goals'); optimism ('making a positive attribution about succeeding now and in the future'); resilience ('when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success') (Luthans and Youssef, 2007 p.3). It is revealed that overall PsyCap yields higher correlations with performance outcomes than its constructs independently (Avolio *et al.*, 2007). In addition, PsyCap can be developed and improved through training (Luthans *et al.*, 2010).

As mentioned above, Sweetman and Luthans (2010) proposed PsyCap is the antecedent of engagement. In addition, we consider that PsyCap may be a potential antecedent of SSTLBs in several ways. Leaders who are more hopeful tend to set higher standards on safety performance and become role models of safety behaviours. They are highly motivated to make their followers comply with the safety standards through various actions such as establishing a safety responsibility system, acting on safety policies, and recognizing followers' safety behaviours. Furthermore, their efficacious and optimistic beliefs about succeeding with their objectives on safety improvement lead them to put in the effort and persistence required to succeed. Finally, highly resilient leaders are more able to bounce back from adversity and stay focused on handling safety issues. As a result, they can find ways around difficulties to achieve better safety performance.

Based on our review, we expect personal resources (PsyCap) is a moderator between job resources (social support and work autonomy) and work engagement. It means that the effect of job resources on work engagement would be strengthened when the level of Figure 1 summarises the concept model, showing the hypothesised relations among contextual factors (job resources and job demands), personal factors (job resources), work engagement, and safety-specific transformational leadership behaviours. The model has the following proposition:

21. Job resources (social support and work autonomy) relates positively to work engagement.
22. Personal resources (psychological capital) moderates the relationship between job resources and work engagement. That is, the effect of job resources on work engagement would be strengthened when the level of psychological capital is high, vice versa.

23. Job demands (risk perception) relates positively to work engagement up to a certain point. After that, it relates negatively to work engagement because leaders are overwhelmed with the job stress caused by a high level of risk perception.
24. Work Engagement relates positively to safety-specific transformational leadership behaviours.

PsyCap is high, and vice versa.

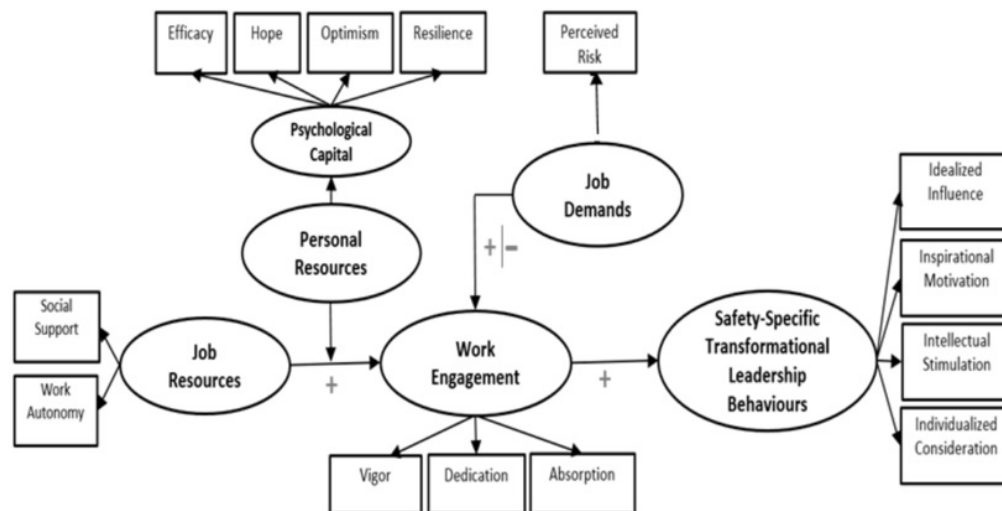


Figure 1. Conceptual model

## IMPLICATIONS FOR FUTURE RESEARCH

Our conceptual framework shown in Figure 1 not only offers new insights into understanding what and how different contextual and personal factors could affect leaders' engagement in SSTLBs, but it also opens a few directions for future empirical research. First, the conceptual model was built based on the mechanism of the JD-R model. The JD-R model posits that job demands and resources, and personal resources influence work behaviours through work engagement. We explained in the above sections why and how our proposed model could mirror the underlying mechanism of the JD-R model. Thus, our conceptual model could lay a foundation for future studies to use the JD-R model for conducting behaviour-based safety research.

Second, we could need a different level and/or combination of contextual and personal factors for supporting top management and first-line supervisors to engage in SSTLBs. For instance, front-line supervisors may need more social support than the top management in order to engage in SSTLBs, because front line supervisors generally have fewer resources and leadership experience. Therefore, we suggest that future research can test the conceptual model in a multiple-level framework that is divided by different managerial levels. In other words, we will make job titles as a control variable in our study.

Last, to empirically test the validity of our conceptual model in future studies, we suggest using survey designs and independent outcome measures, coupled with structural equation modelling (SEM) for data analysis. Basically, all the variables in the conceptual model have their own existing measurements, for example, work engagement can be measured by the well-established Utrecht Work Engagement Scale

(Schaufeli *et al.*, 2002). Furthermore, we propose using SEM as the statistical method for testing our model for two reasons: 1) SEM can examine a series of dependence relationships simultaneously while other multivariate techniques cannot. For instance, in our conceptual model, increasing job and personal resources could increase work engagement, and work engagement could increase the application of SSTLBs. Thus, work engagement is both a dependent and independent variable. In other words, a hypothesized dependent variable becomes an independent variable in a subsequent dependent relationship. To our knowledge, none of the multivariate techniques, except for SEM, can enable us to assess these relationships; 2) SEM allows us to test both measurement properties and test the key theoretical relationships in one technique.

## CONCLUSIONS

Our main focus in this paper has been to develop a conceptual model for understanding what and how contextual and personal factors could affect construction leaders' engagement in SSTLBs, and thus it provides us with insights into how SSTLBs could be better supported and promoted. Our central argument is twofold. First, the application of SSTLBs is positively affected by work engagement. Second, by supporting the job resources (social support and work autonomy) and personal resources (psychological capital), and controlling the job demands that arise from historical accident records and risk perception, organisations have potentially to set a positive wheel of work engagement and SSTLBs for driving better safety climate and performance.

## REFERENCES

- Arezes, P M (2008) Risk perception and safety behaviour: A study in an occupational environment, *Safety Science*, **46**(6), 900-907.
- Avey, J B, Reichard, R J, Luthans, F and Mhatre, K H (2011) Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance, *Human Resource Development Quarterly*, **22**(2), 127-152.
- Arnold B Bakker and Evangelia Demerouti (2008) Towards a model of work engagement. *Career Development International*, **13**(3), 209-223.
- Bakker, A B and Demerouti, E (2007) The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology*, **22**(3), 309-328.
- Bakker, A B and Xanthopoulou, D (2013) Creativity and charisma among female leaders: The role of resources and work engagement. *The International Journal of Human Resource Management*, **24**(14), 2760-2779.
- Barling, J, Loughlin, C and Kelloway, E K (2002) Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology*, **87**(3), 488-496.
- Barling, J, Slater, F and Kevin Kelloway, E (2000) Transformational leadership and emotional intelligence: an exploratory study. *Leadership and Organization Development Journal*, **21**(3), 157-161.
- Bass, B M (1990) From Transactional to Transformational Leadership: Learning to Share the Vision. *Organizational Dynamics*, **18**(3), 19-31.
- Bass, B M and Avolio, B J (1993) Transformational leadership and organizational culture. *Public Administration Quarterly*, **17**(1), 112-121.



- Breaugh, J A (1999) Further Investigation of the Work Autonomy Scales: Two Studies. *Journal of Business and Psychology*, **13**(3), 357-373.
- Clarke, S (2006) The relationship between safety climate and safety performance: A meta-analytic review. *Journal of Occupational Health Psychology*, **11**(4), 315-327.
- Clarke, S (2013) Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *Journal of Occupational and Organizational Psychology*, **86**(1), 22-49.
- Conchie, S M, Moon, S and Duncan, M (2013) Supervisors' engagement in safety leadership: Factors that help and hinder. *Safety Science*, **51**(1), 109-117.
- Conger, J A and Kanungo, D R N (1998) *Charismatic Leadership in Organizations*. Thousand Oaks, CA: Sage Publications, Inc.
- DeJoy, D M, Schaffer, B S, Wilson, M G, Vandenberg, R J and Butts, M M (2004) Creating safer workplaces: Assessing the determinants and role of safety climate. *Journal of Safety Research*, **35**(1), 81-90.
- Demerouti, E, Bakker, A B, Nachreiner, F and Schaufeli, W B (2001) The job demands-resources model of burnout. *Journal of Applied Psychology*, **86**(3), 499-512.
- Flin, R, Mearns, K, O'Connor, P, and Bryden, R (2000) Measuring safety climate: Identifying the common features. *Safety Science*, **34**(1), 177-192.
- Grote, G (2007) Understanding and assessing safety culture through the lens of organizational management of uncertainty *Safety Science*, **45**(6), 637-652.  
<http://doi.org/10.1016/j.ssci.2007.04.002>
- Hakanen, J and Roodt, G (2010) Using the job demands-resources model to predict engagement: Analysing a conceptual model. In: A B Bakker and M P Leiter (Ed.) *Work Engagement: A Handbook of Essential Theory and Research*. New York, NY: Psychological Press, 54-68.
- Hoffmeister, K, Gibbons, A M, Johnson, S K, Cigularov, K P, Chen, P Y and Rosecrance, J C (2014) The differential effects of transformational leadership facets on employee safety. *Safety Science*, **62**, 68-78.
- Hofmann, D A and Jones, L M (2005) Leadership, collective personality, and performance. *Journal of Applied Psychology*, **90**(3), 509-522. <http://doi.org/10.1037/0021-9010.90.3.509>
- Inness, M, Turner, N, Barling, J and Stride, C B (2010) Transformational leadership and employee safety performance: A within-person, between-jobs design. *Journal of Occupational Health Psychology*, **15**(3), 279-290.
- Lorente, L, Salanova, M, Martínez, I M and Vera, M (2014) How personal resources predict work engagement and self-rated performance among construction workers: A social cognitive perspective. *International Journal of Psychology*, **49**(3), 200-207.
- Mearns, K J and Reader, T (2008) Organizational support and safety outcomes: An un-investigated relationship? *Safety Science*, **46**(3), 388-397.
- M Goldenhar, L, Williams, L J and G Swanson, N (2003) Modelling relationships between job stressors and injury and near-miss outcomes for construction labourers. *Work and Stress*, **17**(3), 218-240.
- Nahrgang, J D, Morgeson, F P, and Hofmann, D A (2011) Safety at work: A meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology*, **96**(1), 71-94.

- Saboe, K (2012) Fit to Lead? Supervisors' Health Behaviors, Well-Being, and Leadership Behaviors. PhD Thesis, University of South Florida. Available from <http://scholarcommons.usf.edu/etd/4218/>
- Schaufeli, W B and Bakker, A B (2004) Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, **25**(3), 293-315.
- Schaufeli, W B, and Bakker, A B (2010) Defining and measuring work engagement: Bringing clarity to the concept. In: A B Bakker and M P Leiter (Eds.) *Work Engagement: A Handbook of Essential Theory and Research*, New York, NY: Psychology Press, 10-24.
- Schaufeli, W B, Bakker, A B, and Renen, W V (2009) How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior*, **30**(7), 893-917.
- Schaufeli, W B, Salanova, M, González-Romá, V and Bakker, A B (2002) The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, **3**(1), 71-92.
- Shannon, H S, Mayr, J and Haines, T (1997) Overview of the relationship between organizational and workplace factors and injury rates. *Safety Science*, **26**(3), 201-217.
- Simpson, M R (2009) Engagement at work: A review of the literature. *International Journal of Nursing Studies*, **46**(7), 1012-1024.
- Sweetman, D and Luthan, F (2010) The power of positive psychology: Psychological capital and work engagement. In: A B Bakker and M P Leiter (Eds.) *Work Engagement: A Handbook of Essential Theory and Research*. New York, NY: Psychological Press, 54-68.
- Turner, N, Chmiel, N, Hershcovis, M S and Walls, M (2010) Life on the line: Job demands, perceived co-worker support for safety, and hazardous work events. *Journal of Occupational Health Psychology*, **15**(4), 482-493.
- Qadeer, F and Jaffery, H (2014) Mediation of Psychological Capital between Organizational Climate and Organizational Citizenship Behavior. *Pakistan Journal of Commerce and Social Sciences*, **8**(2), 453- 470.
- Xanthopoulou, D, Bakker, A B, Demerouti, E and Schaufeli, W B (2007) The role of personal resources in the job demands-resources model. *International Journal of Stress Management*, **14**(2), 121-141.
- Zohar, D (2010) Thirty years of safety climate research: Reflections and future directions. *Accident Analysis and Prevention*, **42**(5), 1517-1522.
- Zohar, D, and Tenne-Gazit, O (2008) Transformational leadership and group interaction as climate antecedents: A social network analysis. *Journal of Applied Psychology*, **93**(4), 744-757.