Leadership improvement and its impact on workplace safety in construction projects: A conceptual model and action research

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Abstract

Leadership is proven as a key factor impacting safety while researchers and practitioners are fostering proactive approaches to preventing workplace injuries. Practitioners’ lack of leadership is one of the major causes for the continuous high-level accident frequency within the construction projects. An important yet still unsettled academic issue is how leadership impacts safety performance of construction projects, and how safety leadership can be improved. In order to probe into the mechanism by which leadership improves project safety, this study develops a safety leadership model for construction projects (SLMCP) in both theoretical and pragmatic perspectives. Theoretically, this model incorporates specific characteristics of construction projects and applies a multiple levels-of-management perspective to depict leadership’s cascading influences across project stakeholders. Safety culture and safety management are the two major paths by which leadership impacts safety performance. Pragmatically, the action research (AR) method is used to validate the theoretical model empirically and develop feasible measures to implement safety leadership in practice. A five-round longitudinal evaluation confirmed in a case study the validity of SLMCP and the effectiveness of safety leadership improvement measures. This paper contributes to the body of knowledge by clearly depicting safety leadership’s cascading top-down influencing mechanism in construction projects and providing concrete and validated measures for leadership improvement. The AR based intervention also establishes a general procedure for leadership promotion in practice. Conclusions of the paper serve as novel ideas and methods for workplace safety improvement in construction projects.

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1. Introduction

Despite that an increasing number of occupational health and safety provisions have been introduced in many countries, the accident frequency in construction projects still stays at a high level (Abudayyeh et al., 2006; Fang and Wu, 2013). One of the main reasons is that construction project managers lack safety leadership (Tam et al., 2004; Wu et al., 2016), which has been proven to be able to enforce rules and regulations, and reduce misalignment between management commitment and subordinates’ actions in highly hazardous and complex working environments (Martin and Lewis, 2014; Tyssen et al., 2014). Strong safety leadership is gradually regarded as the key to safety performance improvement of construction projects, especially for countries where the construction industry is facing significant safety challenges and requires transformational development (Construction Users Roundtable, 2012; Wu et al., 2016).

Several previous studies have examined the effect of safety leadership on safety performance (O’Dea and Flin, 2001; Barling et al., 2002; Zohar, 2002; Neal and Griffin, 2006; Griffin and Hu, 2013). Safety leadership is a sub-system of leadership (Pater, 2001), and can be defined as “the process of interaction between leaders and followers, through which leaders can exert their influence on followers to achieve organizational safety goals under the circumstances of organizational and individual factors” (Wu et
A majority of previous safety leadership studies focused on the full range leadership model which is mainly composed of transformational and transactional leadership (Barling et al., 2002; Lu and Yang, 2010; Banks et al., 2016). Transactional leadership is related to monitoring and rewarding whereas transformational leadership is directed towards inspiring and genuinely motivating the workforce (Reid et al., 2008). In particular, the transformational leadership theory has received a tremendous amount of attention in the last three decades and has deservedly emerged as one of the most dominant leadership theories (Braun et al., 2013; Mhatre and Riggio, 2014). Transformational leadership describes how a leader seeks to meet the high-order needs of followers and motivate them to go beyond their self-interests and contribute to the common benefits of the whole organization. As safety is typical organizational higher-order interests than pure pecuniary benefit, transformational leadership is assumed to be especially effective in improving safety performance.

However, safety leadership research pertaining to construction projects and the construction industry is scarce compared with other types of projects and industries (Keegan and Den Hartog, 2004; Chan and Chan, 2005; Ofori and Toor, 2012). In recent years, to further improve safety conditions at the worksite, researchers have shifted their focus from technical approaches to organizational and managerial factors (Zohar, 1980; Reason, 1990; Fang and Wu, 2013), exploring root causes and preventive measures of unsafe behavior on the organizational level. The organizational antecedents of unsafe behavior can be grouped into two categories, i.e. safety management and safety culture (Cooper, 2000; Labodová, 2004). Safety management relates to the actual practices, roles and functions associated with remaining safe (Kirwan, 1998). It can also be understood as mechanisms that are integrated in the organization and designed to control the hazards that can affect workers’ health and safety (Labodová, 2004). Safety culture reflects the attitudes, beliefs, perceptions, and values that employees share in relation to safety (Cox and Cox, 1991). The effects of safety management and safety culture on safety performance were explored and analyzed by many previous studies (Fang and Wu, 2013; Morrow et al., 2014; Podgórski, 2015; Karanikas, 2017), among which Mearns et al. (2003) found out the combined effects of safety management and safety culture on safety performance.

However, although safety management and safety culture play crucial roles, they are not the root causes for safety performance improvement (Zohar, 2002). The safety management system and safety culture should be established and also enhanced with the support and promotion of senior leaders (Barling et al., 2002; Zohar, 2002; Construction Users Roundtable, 2012; Hoffmeister et al., 2014; Wu et al., 2016). On one hand, effective safety leadership promotes leader-and-follower exchange, classifies managerial roles and functions, and facilitates managerial measure implementation. On the other hand, by role modeling, idealized influence, inspirational motivation, innovation orientation and individualized consideration, safety leadership can lead to favorable safety culture, distribute good values, perceptions and behavioral norms to all corners of the organization through safety culture, and thus guarantee that all members make right decisions in critical locations and moments (Wu et al., 2015).

However, the academia has not deeply probed into the mechanism by which safety leadership of project stakeholders improves workplace safety in construction projects. Although some studies discussed safety leadership and their impacts on safety performance (Conchie et al., 2013; Hoffmeister et al., 2014), due to insufficient consideration of the specific characteristics of the construction projects such as multiple stakeholders, construction process, management practice, organizational structure and characteristics of worker behavior, results of these studies vary greatly and the validity and reliability of the reported findings are yet to be proven.

To address these limitations in the current academia, this study developed a conceptual model of safety leadership in construction projects, in order to incorporate the features of the construction projects and establish a theoretical framework for safety leadership research within the construction industry. Based on this model, an action research approach was applied to design and implement safety leadership measures in a case construction project. This study thus aims to contribute to the safety leadership and management literature by providing conceptual and empirical evidence of how leadership influences safety performance of construction projects, and what measures can be taken to fulfill safety leadership and thus improve safety performance.

2. Development of safety leadership model for construction projects (SLMCP)

2.1. A multi-levels-of-management perspective for safety leadership

The life of construction projects is a phased process (Behm, 2005), which can be divided into several stages and involves different parties at each stage. In the execution stage of construction projects, the project team mainly consists of three stakeholders, i.e. the owner, the contractor and the subcontractors (Fang and Wu, 2013). Safety leadership of different stakeholders interacts with each other in the construction process and exerts combined influence on safety management, safety culture and in turn safety performance of construction projects in a manner which is distinct from safety leadership within the traditional, non-projectized organizations (Chiocchio et al., 2010; Fang and Wu, 2013; Wu et al., 2016). More specifically, strong project safety leadership should go beyond traditional organizational boundaries in order to influence frontline personnel significantly, but this is not necessary for leadership of non-projectized organizations (Wu et al., 2016). However, when interpreting leadership fulfillment and impacting mechanism, the current academic literature tends to only focus on the single-level leader-follower relationship, but has not deeply analyzed leadership fulfillment across multiple hierarchical levels and leadership interaction between different project stakeholders (Chun et al., 2009; DeChurch et al., 2010). As one of the few exceptions, Chun et al. (2009) found that leadership at higher levels of management was positively related to leadership at the next lower level, which was in turn related to follower outcomes at the lowest echelon. Their study also distinguished distant leadership from close leadership and found that leader-follower distance could make a difference in leadership impacting mechanism. In
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