Roles of owners' leadership in construction safety: The case of high-speed railway construction projects in China

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Abstract

Owners' role in project safety improvement is drawing increasing attention in the academia. Their greatest leverage is the leadership to influence safety perception, motivation and behavior of other stakeholders. However, previous studies have not paid enough attention to owners' leadership and its impacting mechanisms, nor have they identified effective leadership behaviors related to high safety performance. This paper seeks to present a comprehensive interpretation of owners' role in construction safety by identifying their effective leadership practices and specific managerial measures. A case study was undertaken on Chinese high-speed railway construction projects currently undergoing significant safety improvement thanks to their owner's commitment to safety. The ethnographic research method was applied to collect empirical data, i.e. the owner's safety leadership and management practices. Based on grounded theory, four categories of safety leadership practices were identified to interpret what types of leaders are required in construction projects. Four safety managerial chains driven by safety leadership were synthesized. They give insights into the measures which owners can implement to improve construction safety. Concrete and specific measures were explored for construction owners, especially those in developing countries, to enhance their safety leadership and management. These findings can be used by construction owners to improve their safety leadership and reinforce their involvement in project safety management, especially when their industry is facing significant safety challenges and demanding transformational development.
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1. Introduction

The construction industry is reported in the majority of countries as having a highest occupational injury rate (Abudayyeh et al., 2006; Health and Safety Executive, 2014; US Bureau of Labor Statistics, 2014). Although it is the unsafe acts of frontline workers that directly lead to accidents on construction sites, the upper management tends to be the root cause of accident occurrence (Choudhry and Fang, 2008; Fang et al., 2015). In recent years, the role of management behavior on safety performance has drawn tremendous attention from both construction practitioners

and researchers. Project managers from owners, contractors to subcontractors play different roles in achieving an injury-free worksite (Gambatese, 2000; Huang and Hinze, 2006; Toole, 2002). Among all parties of construction projects, owners hold the greatest leverage, which is first and foremost the leadership and authority to influence the behavior of other stakeholders, and thus can be regarded as project senior leaders (Construction Users Roundtable, 2012). Owners who take a proactive role in safety can significantly influence the safety experience on a construction project (Gambatese, 2000). Owners' involvement, including both participation and leadership, is especially important when the construction firm is not fully committed to safety (Hinze, 2006). A project team will be either empowered to succeed or condemned to fail largely by the quality of the leadership skills of project managers, especially those from the owner side

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(Construction Users Roundtable, 2012). For those countries whose construction industries are faced with significant safety challenges and need transformational development, strong leadership of owners may be the key to improvement. In view of the low safety performance level of the construction industry, it is important for researchers to probe into the mechanism by which owners' safety leadership improves construction safety.

However, although a number of previous studies, for instance Huang and Hinze (2006) and Musonda et al. (2013), investigated owners' influence on construction safety, attention paid to owners' leadership, its practical skills and its relationship with safety performance of construction projects is insufficient. Several studies, for instance O'Dea and Flin (2001) and Dahl and Olsen (2013), analyzed the impact of owners' leadership involvement in daily work operations on the level of safety performance, but they were mostly undertaken outside of the construction industry. In addition, these studies only depicted the general impacting path from safety leadership to safety performance indicators (such as worker safety behavior), but did not interpret the specific leadership practices or detailed managerial measures promoted by safety leadership to improve safety performance. In addition, safety leadership research has focused on the supervisory level and few have examined the influence of senior-level managers (Lu and Yang, 2010). Thus, construction owners lack distinct and concrete instructions to fulfill their role of project senior leaders in the existing literature.

To meet the above challenge, the present study aims at probing into owners' role in construction safety in a more detailed and comprehensive manner, in order to provide construction owners with substantial instructions to safety improvement by safety leadership and management. Two critical objectives are specified as follows: (1) identifying owners' leadership styles and practices required in construction industries, especially when the industries are facing significant safety challenges and demands transformational development; and (2) depicting the specific managerial measures that owners can implement to improve construction safety. Findings pertaining to the two objectives will be further discussed to explore the characteristics of owners' safety leadership and safety management which are closely associated with safety improvement of construction projects.

During the construction phase of projects, owners, contractors and subcontractors are the three main stakeholders (Fang and Wu, 2013). Owners can be regarded as the senior managers who can demonstrate visible and consistent safety commitment and caring to the middle managers (i.e. project managers of contractors) and supervisors (belonging to either contractors or subcontractors) (Flin and Yule, 2004; Construction Users Roundtable, 2012). This study focuses on owners' safety leadership (i.e. senior leadership of projects) and involvement during construction and expects to give insights into the good practices owners can implement to lead the whole project team to better safety management effectiveness.

2. Safety leadership

Bass (1990) defined leadership as "an interaction between two or more members of a group. That often involves a structuring or restructuring of the situation and the perceptions and expectations of the members… Leadership occurs when one group member modifies the motivation and competencies of others in the group." Chemers (1997) proposed that leadership is "a process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task." Safety leadership is a sub-system of leadership (Pater, 2001). It 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 al., 2007). Considerable research has demonstrated the importance of leadership to safety (Barling et al., 2002; Griffin and Hu, 2013; Hofmann et al., 2003; Zohar, 2002). Leadership is fully implicated in safety, and the majority of previous studies focused on the full-range model of transformational and transactional leadership behaviors (Barling et al., 2002; Kelloway et al., 2006; Lu and Yang, 2010). Transactional leader behaviors are related to monitoring and reward whereas transformational leader behaviors are directed towards inspiring and genuinely motivating the workforce (Reid et al., 2008). Transformational leadership has four categories/dimensions, i.e. idealized influence (charisma), inspirational motivation, intellectual stimulation, and individualized consideration. Transactional leadership contains two dimensions, contingent reward and management-by-exception (Avolio and Bass, 1991). In particular, the effectiveness of transformational leadership in motivating and inspiring employees is shown by a multitude of empirical studies. These studies found that transformational leadership is related to enhanced employee work motivation (Shamir et al., 1993), employee satisfaction (Podsakoff et al., 1990), innovative performance (Pieterse et al., 2010), and commitment to the organization (Avolio et al., 2004). All of these traits are closely related to employees' safety involvement and concerns.

The transformational/transactional leadership framework can be regarded as the foundation of the factor structure of safety leadership. Many other studies constructed their specific dimensions of safety leadership in order to better measure it. Dimensions of safety leadership reported in the literature include safety motivation, safety inspiring, safety policy, safety concern, safety monitoring, safety learning, safety coaching, safety caring, safety controlling, etc. (Griffin and Hu, 2013; Lu and Yang, 2010; Wu, 2005; Wu et al., 2007). However, almost all of these studies took into account different aspects of transformational/transactional leadership, resulting in that the identified dimensions have close relationships with those of transformational/transactional leadership. For example, safety motivation and safety inspiring have similar meanings with idealized influence and inspirational motivation. Safety caring and safety coaching overlap with intellectual stimulation. Safety caring is related to individual consideration. Safety policy, safety monitoring, and safety controlling are closely linked to contingent reward and management-by-exception.

The strong predicting power of transformational/transactional leadership to safety performance has been demonstrated in a number of previous studies, some of which have developed safety-specific constructs arising from the original ones (Barling et al., 2002). In this situation, safety leadership can be seen as