



Do you see what I see? Effects of national culture on employees' safety-related perceptions and behavior



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ARTICLE INFO

Article history:

Received 20 February 2014

Received in revised form 8 March 2015

Accepted 9 March 2015

Available online 16 March 2015

Keywords:

Occupational safety

National culture

Safety behavior

Supervisor safety support

Migrant workers

Oil and gas

Structural equation modeling

ABSTRACT

Growing international trade and globalization are increasing the cultural diversity of the modern workforce, which often results in migrants working under the management of foreign leadership. This change in work arrangements has important implications for occupational health and safety, as migrant workers have been found to be at an increased risk of injuries compared to their domestic counterparts. While some explanations for this discrepancy have been proposed (e.g., job differences, safety knowledge, and communication difficulties), differences in injury involvement have been found to persist even when these contextual factors are controlled for. We argue that employees' national culture may explain further variance in their safety-related perceptions and safety compliance, and investigate this through comparing the survey responses of 562 Anglo and Southern Asian workers at a multinational oil and gas company. Using structural equation modeling, we firstly established partial measurement invariance of our measures across cultural groups. Estimation of the combined sample structural model revealed that supervisor production pressure was negatively related to willingness to report errors and supervisor support, but did not predict safety compliance behavior. Supervisor safety support was positively related to both willingness to report errors and safety compliance. Next, we uncovered evidence of cultural differences in the relationships between supervisor production pressure, supervisor safety support, and willingness to report errors; of note, among Southern Asian employees the negative relationship between supervisor production pressure and willingness to report errors was stronger, and for supervisor safety support, weaker as compared to the model estimated with Anglo employees. Implications of these findings for safety management in multicultural teams within the oil and gas industry are discussed.

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1. Introduction

Increased international trade and globalization are increasing the cultural diversity of the modern workforce (Mearns and Yule, 2009; Starren et al., 2013). This diversity typically manifests as multinational work teams with locally-sourced employees and contractors performing operational tasks under the management of foreign leadership. Furthermore, due to the competitive nature of the modern business world and reduced economic confidence, there has been a rapid increase in contingent or contract-based work, which is often outsourced overseas or tendered out to international companies (Clarke, 2003). Finally, large-scale migration of national workforces is on the increase as employees relocate to countries with stronger economies (OECD, 2009).

Importantly for employers and employees alike, migrant workers have been found to have a higher likelihood of experiencing safety incidents than non-migrant or 'local' workers (Mearns and Yule, 2009). In this instance, 'migrant workers' refers to employees who travel temporarily or relocate permanently from their home country to obtain work, and hence usually have a different nationality and culture to their employer (Starren et al., 2013). Notably, a systematic literature review concluded that migrant workers generally experience higher job-related mortality and injury rates as compared to non-migrant or 'native' workers (Ahonen et al., 2007). Further, a recent analysis of accident data from Denmark, the United Kingdom, and the Netherlands concluded that migrant workers are a vulnerable occupational group (Guldenmund et al., 2013). A study conducted by Wu and colleagues (1997) examined differences in occupational injury rates between Taiwanese and foreign-born workers, with a key result being elevated injury risk among workers new to the country. In addition, research conducted in Singapore found that the industrial incident rate for foreign-born workers was over

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three times the rate for domestic workers (Bong et al., 1976). On the basis of this research, workers employed by foreign companies operating in Asian countries are likely to experience a higher risk of injury than domestic or local employees.

What is less clear from research conducted to date is why migrant workers experience such poor safety outcomes. Safety researchers have proposed a raft of causal factors regarding migrant workers in general, including the nature of the job, migrants' level of safety competency, work motivation, organizational factors, and national culture. Although factors including hazard exposure (Van Hooff et al., 2009), safety knowledge (Menzel and Gutierrez, 2010), motivators for working in high-risk jobs (Guldenmund et al., 2013; Van den Bossche et al., 2006), and language challenges (De Vries et al., 2007; Madera and Chang, 2011) are likely to influence the risk of injury among migrant workers, differences in injury involvement have been found to persist even when these contextual factors are controlled (Bollini and Siem, 1995; Dong and Platner, 2004; Loh and Richardson, 2004; Van Hooff et al., 2009). This means that other variables must contribute such as national culture, which has been defined as 'the collective programming of the mind acquired by growing up in a particular country' (Hofstede, 1991, p. 262).

Far less attention has been paid to exploring the role of national culture in explaining additional variance in safety outcomes for migrant workers, compared to other factors such as communication quality and level of safety knowledge (Mearns and Yule, 2009). This is surprising because emerging neuroscience research has uncovered fundamental differences in cognitive processes between cultural groups, which have been linked to safety performance issues such as increased errors and injuries (Blai et al., 2008; Chua et al., 2005; Strauch, 2010), and more specific to this study, differences have been found between risk appraisal and risk-taking behavior between Western and Asian cultures (Bontempo et al., 1997; Lu et al., 2012; Weber and Hsee, 1998).

Clearly, the nature of the relationship between national culture and safety performance requires further investigation. Only a handful of studies have explicitly focused on national culture in the context of workplace safety, and fewer still have examined the interplay of multiple national cultures often present within high-risk settings (e.g. multinational oil and gas operations). As safety management has advanced to the point where incident rates within many organizations have plateaued (Hudson, 2007), there is significant opportunity to make further incremental advancements in the science and practice of safety. Notably, these advancements are likely to spur improvements in both worker safety and organizational competitive advantage.

For example, few previous studies have explored the role of specifically Southern Asian cultures, as well as the interaction of Asian and Anglo national cultures in contributing to occupational safety performance in the oil and gas industry. As oil and gas companies increase their global presence, such as in the Asia-Pacific region where many natural resource deposits remain untapped, greater understanding of how these national cultures impact safety would be advantageous. Oil and gas companies in this region typically consist of a leadership layer drawn from Anglo countries such as Australia and the US, and a migrant workforce drawn from Asian countries such as Indonesia, the Philippines, China, and Taiwan. These migrant workers are usually employed on a contract basis to carry out operational work alongside Anglo leaders and co-workers, which creates opportunities for cultural differences to become salient. Research in this area would have significant practical implications for the improvement of safety for culturally-diverse work groups in general, and migrant workers sourced from Asia and working within oil and gas specifically.

Consequently, the objective of this study was to investigate hypothesized differences between migrant Southern Asian workers (Indonesian and Filipino) and Anglo (Australian and US) workers' safety-related perceptions and safety compliance in terms of descriptive (i.e., group means) and causal (i.e., structural paths) characteristics. To do so, we adopted a structural equation modeling approach that firstly evaluated the cross-cultural equivalence of our measurement instrument, followed by theory-driven multi-group invariance testing of latent means and causal pathways between safety constructs. This study begins to fill a wide empirical gap in cross-cultural safety research through a rigorous evaluation of safety-related measures and evaluation of cultural theories in the safety context, advances practical understanding of the determinants of safety performance within culturally-diverse work groups, and contributes methodologically via the demonstration of structural equation techniques that are underutilized in safety research: multi-group analysis and invariance testing.

2. Literature review and hypothesis development

Oil and gas is an industry in which safety has long been integrated within core business functions; yet, catastrophic incidents continue to occur such as the recent Deepwater Horizon explosion. Increasingly, these incidents are shown to be caused in part by person-related factors, such as leadership production pressure, poor quality communication, and team conflict (Kath et al., 2010; Kines et al., 2010; Zohar, 2002). As a result, the oil and gas industry is starting to approach occupational health and safety in a more holistic manner by diagnosing and addressing the psychosocial factors that contribute to human error and safety incidents (Bergh et al., 2014).

Oil and gas companies have a long history of operations in geographically-diverse regions. The majority of these companies, being Western-owned, were borne out of colonial expansions out of Europe and into regions rich in oil and gas deposits such as Africa, Asia, and the Americas (Feng and Mu, 2010). A further characteristic of oil and gas companies is that they typically consist of a 'core' team of managers, frontline leaders, and operational staff, and supplement this group with technical specialists (e.g., engineers), site support staff (e.g., security and hospitality), and laborers (for tasks such as tree-felling and site preparation) supplied by local contractors (Mearns and Yule, 2009). This means that cultural diversity has long been a part of oil and gas operations; however, this has only recently been formally acknowledged and managed as part of an organizational health and safety system (Mearns and Yule, 2009). Consequently, there are many unanswered questions surrounding the mechanisms by which national culture influences occupational safety.

Indeed, a cross-cultural workforce has been shown to create challenges for oil and gas operators. Issues identified thus far include poor quality communication, reduced productivity, and conflict with local communities (Feng and Mu, 2010). Recently, a study conducted in a multinational oil and gas contractor company revealed that employees' individual cultural values and beliefs contributed meaningfully to the prediction of risk-taking behaviors over and above organizational factors such as management's commitment to safety (Mearns and Yule, 2009). Although these results suggest that national culture is important in managing oil and gas safety, to our knowledge no studies have investigated the interplay of multiple national cultures, such as during interactions between leaders and workers from different ethnic backgrounds. Research in this area has tended to focus on the relationships between individuals' own cultural values (either at a person level or aggregated to a group level) and safety outcomes, which overlooks the possibility that cultural differences may be

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