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Q1 Organizational culture and a safety-conscious work environment: The 3 mediating role of employee communication satisfaction

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ABSTRACT

Introduction: A safety-conscious work environment allows high-reliability organizations to be proactive regarding safety and enables employees to feel free to report any concern without fear of retaliation. Currently, research on the antecedents to safety-conscious work environments is scarce. *Method:* Structural equation modeling was applied to test the mediating role of employee communication satisfaction in the relationship between constructive culture and a safety-conscious work environment in several nuclear power plants. *Results:* Employee communication satisfaction partially mediated the positive relationships between a constructive culture and a safety-conscious work environment. *Conclusions:* Constructive cultures in which cooperation, supportive relationships, individual growth and high performance are encouraged facilitate the establishment of a safety-conscious work environment. This influence is partially explained by increased employee communication satisfaction. *Practical application:* Constructive cultures should be encouraged within organizations. In addition, managers should promote communication policies and practices that support a safety-conscious work environment.

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Q4 1. Introduction

In high-reliability organizations (HROs), a safety-conscious work environment (SCWE) may help prevent catastrophic accidents that can have serious human, economic, and environmental consequences (e.g., INPO [Institute of Nuclear Power Operations], 2013; NEI [Nuclear Energy Institute], 2003). Many types of organizations can be HROs, including chemical plants, aircraft companies, and nuclear power plants, among others.

Accidents are extremely rare in HROs. Nonetheless, failures in system components (e.g., people, equipment, procedures) can interact in unpredictable ways (Perrow, 1984). In addition, because there is high interdependence among system components, failures may cascade into even greater problems before operators can understand the situation (Perrow, 1984). Subsequently, HROs (i.e., nuclear power plants) continuously monitor safety and attempt to anticipate potential problems (Morrow, Koves, & Barnes, 2014).

Therefore, research on SCWEs and their antecedents has practical implications that are relevant for HRO safety. A SCWE is common in those organizations in which employees feel free to raise any concerns to their managers, which managers can use to obtain a complete picture

of the organizational state of operations and to identify “weak cases” or “early warning signs” of safety degradation (e.g., Pidgeon, 1997).

This study, which was conducted in several nuclear power plants, aims to examine the relationship between constructive culture and SCWEs and to assess the mediating role of employee satisfaction with organizational communication in this relationship.

1.1. Constructive culture and a SCWE

Previous research suggests that organizational culture is vital for safety in HROs (e.g., the post-accident investigation into the Challenger disaster; Vaughan, 2009). Nonetheless, the myriad conceptualizations of organizational culture (e.g., Reason, 1997; Turner & Pidgeon, 1997) have prevented the accumulation of knowledge (e.g., Sackmann, 2011). This study attempts to counteract this difficulty by detailing the conceptualization of organizational culture we have adopted.

Organizational culture has been alternatively defined as “the way we do things around here” (Deal & Kennedy, 1982) or as shared symbols, rituals, beliefs, stories, ideologies, values, practices, knowledge, or artifacts (Smircich, 1983), among other definitions. By focusing on constructive culture, this study refers to thinking and behavioral norms. In other words, it addresses the “unwritten rules” that are required to “fit in” and “survive” within an organization (Cooke & Szumal, 2000). These norms refer to the approaches applied to address work and to interact with others.

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Constructive cultures encourage members to interact with others and to approach tasks with the aim of meeting their own higher order satisfaction needs (Cooke & Lafferty, 2003). As such, these organizations promote cooperation, supportive relationships among work colleagues, high-level performance, and individual growth (Cooke & Rousseau, 1988; Cooke & Szumal, 2000).

Constructive cultures balance both people and task orientation and support the attainment of higher order satisfaction needs (Denison, Nieminen, & Kotrba, 2014). Both aspects are critical for conceptualizing organizational culture (for a literature review, see Detert, Schroeder, & Mauriel, 2000; Xenikou & Furnham, 1996), and both rest on sound theoretical foundations. The distinction between people orientation (e.g., concern about employees' satisfaction and overall well-being) and task orientation (e.g., accomplishments of specific goals and execution of the applicable steps to be followed) is well established in the field of organizational culture (e.g., Denison et al., 2014) and leadership (Balthazard & Cooke, 2004; Cooke & Szumal, 1993). Additionally, the concept of higher order satisfaction needs (e.g., self-esteem, achievement, and creativity) was first introduced by Maslow (1954) in his hierarchical theory of motivation. This theoretical approach is well-known in the organizational culture literature (e.g., Denison et al., 2014; Ostroff, Kinicki, & Tamkins, 2003; Xenikou & Furnham, 1996).

The notion of constructive culture has been applied in HROs, including nuclear power plants (e.g., García-Herrero, Mariscal, Gutiérrez, & Toca-Otero, 2013; Klein, Bigley, & Roberts, 1995), and in other organizational contexts (e.g., Pool, 2000; Kwantes & Boglarsky, 2004). Moreover, there is extensive research supporting the reliability and validity of the constructive culture construct (e.g., Denison et al., 2014; Xenikou & Furnham, 1996), which is necessary to discriminate among various types of organizations. A comparative study revealed that constructive culture varied among HROs and "conventional" organizations and among different types of HROs (Klein et al., 1995).

Finally, it is notable that an examination of safety culture is outside the scope of this study. Most theoretical developments regarding safety culture derive from a more generalized notion of organizational culture (Glendon & Stanton, 2000) and respond to "analytical or practical reasons to narrow the concept and thus make it more tangible" (Guldenmund, 2000; p. 223). For instance, according to Pidgeon (1991), safety culture refers to "norms and rules for handling hazards, attitudes toward safety, and reflexivity on safety practice" (p. 135). Constructive culture does not refer to safety thinking and behavioral norms, and its theoretical foundations are sufficiently meaningful and broad to establish parallels with alternative models of organizational culture (Detert et al., 2000; Xenikou & Furnham, 1996). In so doing, this approach allows for an accumulation of knowledge in the field of organizational culture (Denison et al., 2014).

This study aims to examine the relationship between constructive culture and the SCWE. The SCWE, which has captured increased practitioner attention in the nuclear sector (INPO, 2013; NRC-Nuclear Regulatory Commission-, 2011), has been considered as a relevant feature of safety culture by some international organizations (INPO, 2013). However, in the field of social sciences, several authors recommend to avoid the use of safety culture as an "umbrella term" (Guldenmund, 2010; p. 1466) and acknowledge its risks. In the words of Guldenmund (2010), safety culture is a "fuzzy" concept, "this fuzziness is both its strength and its weakness" (Guldenmund, 2010; p. 1466).

The SCWE implies that "... personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination" (INPO, 2013; p. 6). NEI (2003) extends the scope of a SCWE to non-safety-related concerns and establishes that SCWE policies should allow employees the freedom to express both safety-related and non-safety-related concerns to management without fear of reprisal. The current study also focuses on employee concerns that are not necessarily related to safety as a way to determine whether employees are proactive. It is important to consider that the distinction between safety- and non-safety-related concerns is not always obvious. For

instance, the event that occurred in 2002 at Davis-Besse nuclear power plant illustrates how discrepancies that did not seem significant in terms of safety (rust particles in containment air filters) were a sign of safety degradation (Perin, 2005). Accordingly, Weick and Sutcliffe (2007) emphasize the need to note small discrepancies whenever they may occur and to address failures in early stages.

Constructive culture is expected to facilitate the establishment of a SCWE for several reasons. Constructive cultures fulfill individual higher order satisfaction needs. Subsequently, based on the social exchange norm of reciprocity (Blau, 1964), employees may feel obligated to support a SCWE (Blau, 1964). Constructive cultures also promote supportive relationships, which allow individuals to feel secure when raising concerns to their managers instead of glossing over or hiding them. Having supportive relationships might reduce interpersonal risks when raising concerns, such that raising concerns is not perceived as an act of disloyalty or a willingness to interfere in the work of co-workers, for example (Navajas, Silla, & Guldenmund, 2014).

Moreover, empirical research has shown that constructive culture benefits organizational functioning (see Cooke & Szumal, 2000 for an integrative review), employee commitment (Haley, 1998; Klein et al., 1995; Roberts, Rousseau, & La Porte, 1994), job satisfaction (Balthazard, Cooke, & Potter, 2006; Cooke & Szumal, 2000; Stebbins, 2008), role clarity (Balthazard et al., 2006; Pool, 2000), cooperation (Murphy, Cooké, & Lopez, 2013), quality of organizational communication (Balthazard et al., 2006), and organizational products/service quality (Balthazard et al., 2006; Murphy et al., 2013).

Although previous research supports the benefits of constructive culture regarding safety (e.g., García-Herrero et al., 2013; Rousseau, 1989), empirical evidence of these benefits remains scarce. García-Herrero et al. (2013) found constructive culture to be positively associated with safety culture. By contrast, Haley (1998) found a positive relationship between constructive culture and reported medication errors and patient falls, which could be explained by the transparency associated with constructive culture. This transparency might account for the increased number of reported incidents and suggests that fewer reported incidents in some organizations may not necessarily reflect the number of incidents actually occurring. Therefore, the following hypothesis was formulated:

Hypothesis 1. Constructive culture will be positively associated with a SCWE.

1.2. The mediating role of employee satisfaction with organizational communication

This study attempts to more thoroughly evaluate the relationship between constructive culture and a SCWE. This evaluation is achieved by examining the mediating role of employee satisfaction with organizational communication, which is defined as "the collective and interactive process of generating and interpreting messages" (Stohl, 1995; p. 4).

Several arguments support the mediating role of satisfaction with organizational communication. First, organizational culture is expected to influence organizational communication by enabling and constraining it (Bisel, Messersmith, & Keyton, 2010). Thus, in some sense, organizational culture sets the basis for communication (de Cock, de Witte, & van Nieuwerkerke, 1998; Langan-Fox, 2001). The implementation of communication policies and practices will fail if they are not aligned with organizational culture (Xie, Helfert, Lugmayr, Heimgärtner, & Holzinger, 2013). With respect to the connection between constructive culture and communication, Murphy et al. (2013) suggest that constructive culture would increase communication quality and individual interaction. Similarly, Balthazard et al. (2006) provide empirical evidence regarding the positive relationship between constructive culture and communication quality.

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