



## Does talking the talk matter? Effects of supervisor safety communication and safety climate on long-haul truckers' safety performance

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### ABSTRACT

This study examines the distinct contribution of supervisory safety communication and its interaction with safety climate in the prediction of safety performance and objective safety outcomes. Supervisory safety communication is defined as subordinates' perceptions of the extent to which their supervisor provides them with relevant safety information about their job (i.e., top-down communication) and the extent to which they feel comfortable discussing safety issues with their supervisor (i.e., bottom-up communication). Survey data were collected from 5162 truck drivers from a U.S. trucking company with a 62.1% response rate. Individual employees' survey responses were matched to their safety outcomes (i.e., lost-time injuries) six months after the survey data collection.

Results showed that the quality of supervisor communication about safety uniquely contributes to safety outcomes, above and beyond measures of both group-level and organization-level safety climate. The construct validity of a newly-adapted safety communication scale was demonstrated, particularly focusing on its distinctiveness from safety climate and testing a model showing that communication had both main and moderating effects on safety behavior that ultimately predicted truck drivers' injury rates. Our findings support the need for continued attention to supervisory safety communication as an important factor by itself, as well as a contingency factor influencing how safety climate relates to safety outcomes.

### 1. Introduction

Safety climate is generally defined as employees' shared perceptions of their organization's policies, procedures, and practices in regards to the value and importance placed on safety (Zohar, 1980, 2000). According to Zohar (2008, 2010), safety climate should be measured using a framework that distinguishes between *organization-level* (employees' perceptions of top management commitment to and prioritization of safety) and *group-level* (employees' perceptions of direct supervisor or workgroup commitment to safety) safety climate perceptions (Huang et al., 2013). The two safety climate components reflect distinct referent points, top management and direct supervisors, that serve as important cues for employees' safety-related perceptions.

Supervisory communication practices are another workplace factor that may uniquely contribute to safety, above and beyond safety climate (Sinclair et al., 2014). Supervisors are the main channel through

which safety policies and procedures are communicated to subordinates in a "top-down" fashion. Communication also has "bottom-up" effects related to whether subordinates are willing and able to share safety-related concerns with their supervisors.

Our study examined the distinct and interactive effects of safety communication and safety climate on safety performance and objective safety outcomes. Since supervisors are often workers' main source of information about safety concerns (especially in the lone worker context as described below), we focused on group-level safety climate perceptions based on employees' perceptions of their direct supervisors. We tested our hypotheses after controlling for organization-level safety climate, which strengthens the inference that any observed effects are attributable to supervisory communication. We see our study as making two main contributions to the literature.

Our *first* contribution to the literature is to extend prior literature concerning the distinct and interactive roles of safety climate and safety

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communication in safety performance outcomes. Extensive research, summarized in several meta-analytic reviews, demonstrates the importance of safety climate in predicting safety outcomes (Beus et al., 2010; Christian et al., 2009; Clarke, 2006a, 2010; Griffin and Neal, 2000; Nahrgang et al., 2011). A smaller body of literature shows similar benefits of safety communication in empirical tests of communication measures (Griffin and Neal, 2000; Hofmann and Stetzer, 1998; Kath et al., 2010; Parker et al., 2001; Zohar and Luria, 2003) and evaluations of communication-focused interventions (e.g., Kines et al., 2010). Relatively few studies, however, have examined the distinct effects of safety communication and safety climate on outcomes. Additionally, despite their close conceptual relationship, no research that we are aware of has tested interactions between safety communication and safety climate. Such research is important in understanding both the nomological network of safety climate and the contingencies that affect the relationship between safety climate and outcomes. Given these concerns, we examine: (1) the empirical distinctiveness of safety communication and safety climate with respect to construct validity (i.e., distinct factor structure), (2) incremental predictive validity in a model in which safety behavior mediates the relationship of communication and climate with outcomes, and (3) whether safety communication and safety climate interact in their prediction of safety outcomes.

Our *second* contribution concerns the nature of our sample. We focus on long-haul truck drivers who have received relatively little attention in safety literature despite the importance of safety for these workers. Transportation-related incidents are the number one cause of workplace fatalities in the United States, and truckers have a disproportionate share of those incidents (Bureau of Labor Statistics, 2014). From a theoretical perspective, long-haul truckers are an example of lone workers for whom safety climate-related processes may operate differently than for workers aggregated into larger units (e.g., Huang et al., 2013; Olson et al., 2009) and for whom communication with their supervisor may be especially important, as the supervisor often is their only link to the broader organization. Our study extends prior research on truckers' driving safety by investigating the effects of both safety communication and safety climate. We link these antecedents to two outcomes relevant to truckers: (1) self-reports of safe driving performance and (2) an objective measure of days lost to injuries.

### 1.1. Safety climate with lone workers

The increased use of technology and the changing nature of work have led to more workers working alone in isolated locations. Long-haul truck drivers are an excellent representation of lone workers, as they are often on the road and are only required to report to their dispatchers and/or supervisors a few times a day (mostly over the phone or using an electronic device). In fact, they may not have face-to-face conversations with their supervisors for weeks at a time. While safety climate is typically referred to as *shared* perceptions among employees (Neal and Griffin, 2004; Zohar and Luria, 2005), lone workers, including truck drivers, usually do not interact with their supervisors and coworkers. In fact, Huang et al. (2013) found that truck drivers' safety climate perceptions were not shared within their work groups. Insufficient statistical evidence for aggregation and the nature of lone working strongly suggest that truck drivers' safety climate perceptions are best understood at the individual level, sometimes referred to as psychological safety climate (Christian et al., 2009; Huang et al., 2013).

Safety climate perceptions relate to employees' expected consequences of safe or unsafe performance (Zohar, 2010). According to Zohar et al. (2015), safety climate perceptions that are more positive can lead to better safety performance, due to the instrumentality of and valence for positive performance outcomes. If safe performance is perceived to result in supervisory recognition or support, a more positive safety climate will emerge and, thus, promote stronger motivation

for workers to perform in a safer manner (Zohar et al., 2015). In line with this reasoning, as well as other studies of safety-specific supervisor leadership (e.g., Conchie et al., 2012; Kelloway et al., 2006; Mullen and Kelloway, 2009) we expect group-level safety climate (i.e., employees' perceptions about supervisors' commitment to safety) to be related to both safety performance and lost time injury.

**Hypothesis 1.** Group-level safety climate is positively related to safety performance.

**Hypothesis 2.** Group-level safety climate is negatively related to lost time injury.

### 1.2. Supervisory safety communication

Our approach to studying communication focuses on the *quality* of safety communication between supervisors and subordinates. Supervisors who communicate effectively about safety may have employees who have a better understanding of safe behavior and the possible outcomes of unsafe behavior (Michael et al., 2006). Moreover, subordinates who perceive themselves as able to talk with their supervisor about safety issues may be more likely to report unsafe conditions prior to accidents. Thus, we define supervisory safety communication as subordinates' perceptions of the extent to which their supervisor provides them with relevant safety information about their job (i.e., top-down communication) and the extent to which they feel comfortable discussing safety issues with their supervisor (i.e., bottom-up communication).

Several studies demonstrate the importance of safety communication. For example, Zohar and Luria (2003) found that informing supervisors of the number of safety-related exchanges they had with subordinates increased their number of safety-related communications and decreased unsafe behavior. Additionally, Hofmann and Stetzer (1998) found that safety communication moderated the relationship between informational cues of work-related accidents and causal attributions. The authors noted that safety communication from supervisors encouraged upward communication regarding safety (i.e., subordinates voicing safety concerns to management), which may affect how employees view the causes of safety events at work. Taken together, this literature supports both the importance of safety communication for safety-related outcomes and the role of the organization in fostering effective safety communication. Few studies, however, have examined the joint effects of safety communication and safety climate in predicting safety outcomes. Researchers often examine safety communication as a facet of safety climate (e.g., Griffin and Neal, 2000) or as an outcome of safety communication interventions (e.g., Kines et al., 2010; Zohar and Polachek, 2014). What is missing from this literature are studies that examine the distinct effects of safety climate and safety communication in relation to safety outcomes.

The distinction between safety communication and safety climate is an important theoretical and empirical issue in this research stream. Some older models of safety climate treated safety communication as a component of safety climate. For example, Griffin and Neal (2000) treated safety climate as a higher order composite of safety training, management values, safety inspections, and safety communication. Other research, however, treats safety communication either as an antecedent or as a consequence of safety climate. For example, Hofmann and Stetzer (1998) argued that safety climate influences organizational communication practices about safety issues, such that negative safety climates would lead to less open communication about safety issues. In contrast, other researchers have conceptualized communication as an important influence on safety climate (e.g., Kines et al., 2010; Zohar, 2010; Zohar and Polachek, 2014). Zohar (2010) argued for a symbolic social interactionist perspective on the development of climate in that climate arises through employees' sense-making processes about safety issues in the organization, which are shaped by

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