



Negative safety events as correlates of work-safety tension

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ABSTRACT

We investigate the extent to which three types of self-reported negative safety events (i.e., being injured at work, working in an unsafe way, witnessing others working in an unsafe way) correlate with *work-safety tension*. Work-safety tension is bi-dimensional, defined here as the perceived conflict between production and following safety rules (“barriers to safety compliance”) and production and proactive ways of working more safely (“barriers to safety participation”). Directly experiencing or witnessing negative safety events may send signals to employees about the extent to which their organization prioritizes production over safety. We tested a model of negative safety events as predictors of both barriers to safety compliance and barriers to safety participation using survey data from 316 front-line supervisors (97% male, mean age = 44 years) working for a UK rail maintenance company. The number of injuries directly experienced had a positive relationship with perceived barriers to safety compliance, whereas the number of times respondents witnessed others work in an unsafe way had a positive relationship with perceived barriers to safety participation.

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1. Introduction

Employees in many organizations experience a tension between completing work tasks (production pressure) and completing work tasks safely (e.g., Brown et al., 2000; Gouldner, 1954; Janssens et al., 1995). This work-safety tension can translate into less attention and less energy devoted to ensuring work tasks are conducted safely (Probst, 2002), with growing evidence that such trade-offs encourage unsafe work behavior (e.g., Clarke, 2006; McLain and Jarrell, 2007; Morrow et al., 2010; Seo, 2005) such as short-cuts or workarounds (Halbesleben, 2010), and may result ultimately in more workplace injuries (Humphrey et al., 2004).

Much research has focused on work-safety tension and other dimensions of safety climate as determinants of negative safety events like work injuries and unsafe work behavior (McGonagle and Kath, 2010; McLain and Jarrell, 2007; Morrow et al., 2010). However, cross-sectional research in this vein makes two assumptions about work-safety tension. First, it assumes that work-safety tension is unidimensional, despite related research that acknowledges the multi-dimensional nature of safety climate – a shared sense of how the organization values safety (Guldenmund, 2007;

Zohar, 1980) – and employee safety performance (Christian et al., 2009). Second, it assumes work-safety tension *precedes* negative safety events – such that work-safety tension predicts negative safety events. In a recent meta-analysis comparing safety climate → injuries and injuries → safety climate relationships, Beus et al. (2010) showed that injuries → safety climate had a stronger overall relationship than safety climate → injuries, suggesting that negative safety events may not only be caused by but also contribute to perceptions of safety climate.

The current study makes two contributions. First, it measures work-safety tension as two dimensions, consistent with bi-dimensional models of employee safety performance. Second, it investigates how constructs traditionally considered as outcomes – workplace injuries, unsafe behaviors, witnessing others work unsafely – predict work-safety tension. This model invokes social learning and reinforcement theories to justify why negative safety events may contribute to employee perceptions of work-safety tension.

2. Integrating employee safety performance into work-safety tension

Although the distinction between different types of safety performance is well-established in the literature (e.g., Burke et al., 2002; Marchand et al., 1998), one of the assumptions in existing research on work-safety tension (e.g., McGonagle and Kath, 2010;

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McLain and Jarrell, 2007; Morrow et al., 2010) is that safety is a unitary construct, largely about the conflict between following rules to preserve safety and completing work on time. In this paper, we expand the conceptualization of work-safety tension by broadening safety to include both rule following (safety compliance) and preventative actions (safety participation) that contribute to a safe work context. Griffin and Neal (2000) have conceptualized employee safety performance along the same two dimensions (i.e., safety compliance, safety participation), corresponding to two dimensions (task performance, contextual performance) in the more general work performance literature (Borman and Motowidlo, 1993). We draw on social learning and reinforcement theories to predict and examine the extent to which negative safety events predict a tension between production and these two types of employee safety performance. This research has implications for understanding how the day-to-day experience of working may contribute to employee perceptions of safety climate (Guldenmund, 2007).

3. Negative safety events as learning about and reinforcing safety as a priority

Experiencing a workplace injury, behaving in an unsafe way, or witnessing others behaving unsafely are three types of negative safety-related events that may weaken the perception that a collective such as an organization or work-group values safety (Zohar, 1980; Zohar and Luria, 2005). Social learning theory (Bandura, 1977) states that people learn by cognitively processing observed action and information. Key drivers of learning include observed consequences of others' experience (vicarious positive or vicarious negative reinforcement), as well as previous direct experience (positive or negative reinforcement) and anticipated experience (the promise of positive or negative reinforcement).

The most frequent application of social learning theory involves the observation of the behavior of other individuals. The theory suggests that people observe each others' behavior and learn what is considered to be acceptable behavior by gauging the outcomes that others experience. In the context of workplace safety, if employees witness their co-workers behaving in an unsafe way at their own peril, they are likely to infer that such behavior may be necessary to complete work tasks. As such, this might generate felt barriers to both following safety rules (safety compliance) and improving safety at work (safety participation):

H1. Witnessing others behave unsafely will be related to greater perceptions of barriers to safety compliance and greater perceptions of barriers to safety participation.

Research using reinforcement theory in safety (e.g., Olson et al., 2009) suggests that people learn not only from observing the actions of others, but also from observing the consequences (or lack thereof) of their own behaviors. When organizations allow situations in which employees behave in unsafe ways, or worse, employees actually experience injuries at work, these events are likely to communicate to employees that unsafe behavior is tolerated and acceptable in the work environment, that failures in safety are a possibility in this work environment, and thus limit the extent to which safety is achievable in a production context. This occurrence of unsafe work and injury at work serves as reinforcement that the organization values performance over safety, which may create perceived barriers to safety compliance and safety participation.

H2. Unsafe behavior will be related to greater perceptions of barriers to safety compliance and greater perceptions of barriers to safety participation.

H3. Experienced injuries will be related to greater perceptions of barriers to safety compliance and greater perceptions of barriers to safety participation.

Day-to-day choices, actions, and attitudes that concern the competing priorities of timely production and achieving workplace safety occur continually in organizations, and the context of the present study – the railway maintenance in the United Kingdom – is no exception (den Hertog et al., 2005; Sanne, 2008b; Wilson et al., 2009). Production pressure felt by railway workers and concerns about their work safety have recently been overshadowed by public scrutiny for public rail safety failures and increasing demands on the country's high-traffic rail system (Baldry and Ellison, 2006; Cox et al., 2003; Sanne, 2008a). The year-over-year safety record for railway (infrastructure) employees working in the UK rail industry is mixed, with RIDDOR-defined 'major injuries' staying relatively constant over a 5 year period (2005–2010) (ranging from 73 to 78 per year) and 'minor injuries' requiring over 3 days of lost-time decreasing over the same period (ranging from 190 to 100 per year) (Office of Rail Regulation, 2011).

4. Materials and methods

4.1. Sample

As part of a larger project on safety attitudes among employees of a large UK rail infrastructure organization, we surveyed employees ($N = 316$; 97% male; mean age = 44 years) in the summer of 2007 from three distinct occupational groups (42.1% mobile operations managers: 133 respondents; 47.8% site supervisors: 151 respondents; 10.1% project engineers: 32 respondents) working in five geographical territories (12% from Scotland, 26% from London-North-East region, 29% from London-North-West region, 14% from western England, and 19% from south-east England). All three occupational groups are involved in front-line infrastructure work, responding to and correcting incidents in particular track territory. Across the three occupational groups, response rates were 20%, 83%, and 37%, respectively, with a weighted sample response rate of 52%. The distribution of these three occupational groups in the organization is representative of those responding to the survey, with an increased response rate from site supervisors because many were responsible for distributing surveys to mobile operation managers and project engineers. Surveys with postage-paid envelopes were distributed to potential participants in each geographical territory, were completed on work time by participants with permission of the organization, and were either collected by hand or mailed back directly to the researchers. We did not collect respondents' names or employee identification numbers, so all responses were anonymous.

4.2. Measures

4.2.1. Work-safety tension

We measured work-safety tension using seven items (listed in Appendix A) developed for the purposes of this study that were designed to integrate production-related constraints into two distinct dimensions of employee safety performance (safety compliance and safety participation). Participants responded on a five-point scale (1 = not at all to 5 = a great deal), with higher scores indicating greater perceived work-safety tension.

4.2.2. Negative safety events

Negative safety events were measured by self-report, retrospective recall. Respondents reported negative safety events that they encountered in the year prior to the survey for each of: work injuries ("In the last year, how many times have you had a reportable

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