



## Understanding safety in the context of business operations: An exploratory study using case studies

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### ABSTRACT

This exploratory research employs a series of cases studies and a multi-stakeholder perspective to examine safety practices and outcomes in the wider context of business operations. The aims of the research include enhancing the understanding of the practices critical for safe workplaces and of the business value (positive or negative) of safety. Four research questions related to safety practices and outcomes and operational practices and outcomes were addressed. The results provide new and novel insights into safety's role in the organization and show that when safety is examined in the wider organizational context additional rationale for improving safety becomes visible.

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### 1. Introduction

Occupational safety and health research (referred to as safety for the remainder of the paper) has traditionally been done from the perspective of stakeholders such as workers, regulators, and unions, with an understandable emphasis on making workplaces safer. But the safety literature is weak in a critical perspective that could enhance our understanding of safer workplaces. Specifically, safety research rarely explicitly examines safety practices and outcomes in the wider organizational context. Safety research is constrained by this limited stakeholder perspective.

This research attempts to expand the scope of safety research beyond its traditional boundaries, to include an operations management perspective. The operational function is concerned with the delivery of value to customers via strategies such as lean production and practices such as six sigma and kaizen events to improve quality and reduce costs. Operational managers are in charge of the production system that makes the organization's product or service. Operations, unlike many other business functions such as finance, accounting and marketing, is a natural fit with safety because operational workers are those most likely to

suffer workplace injuries and illness. Research on safety and research on operations take place in the same space and involve the same workers and production system; hence it seems vital to examine the two areas simultaneously. Adding an operational perspective to safety research could allow novel insights into how safety is related to other organizational goals and practices allowing for better prescriptions of how to improve safety practice and outcomes.

The field of operations management has a strong tradition of producing research for improving workplace practices (Swamidass, 1986; Hayes and Wheelwright, 1984) and ties its outcomes to four basic operating priorities: cost, quality, delivery, and flexibility (Ward et al., 1995). However, the field generally does not explicitly consider safety as an operating priority. Similarly, the field of safety has a strong tradition of producing research for improving workplace safety practices (Cohen, 1977; Smith et al., 1978; Habeck et al., 1998; Shannon et al., 1997, 2001; Vredenburg, 2002; Mearns et al., 2003) and ties its outcomes to two priorities: preventing injury and illness and minimizing their associated costs. However, the safety literature does not often make explicit linkages to operating priorities. The oversights in both literatures are troubling, given that the workers involved in producing products and delivering services are the same workers that the safety management system is primarily designed to protect.

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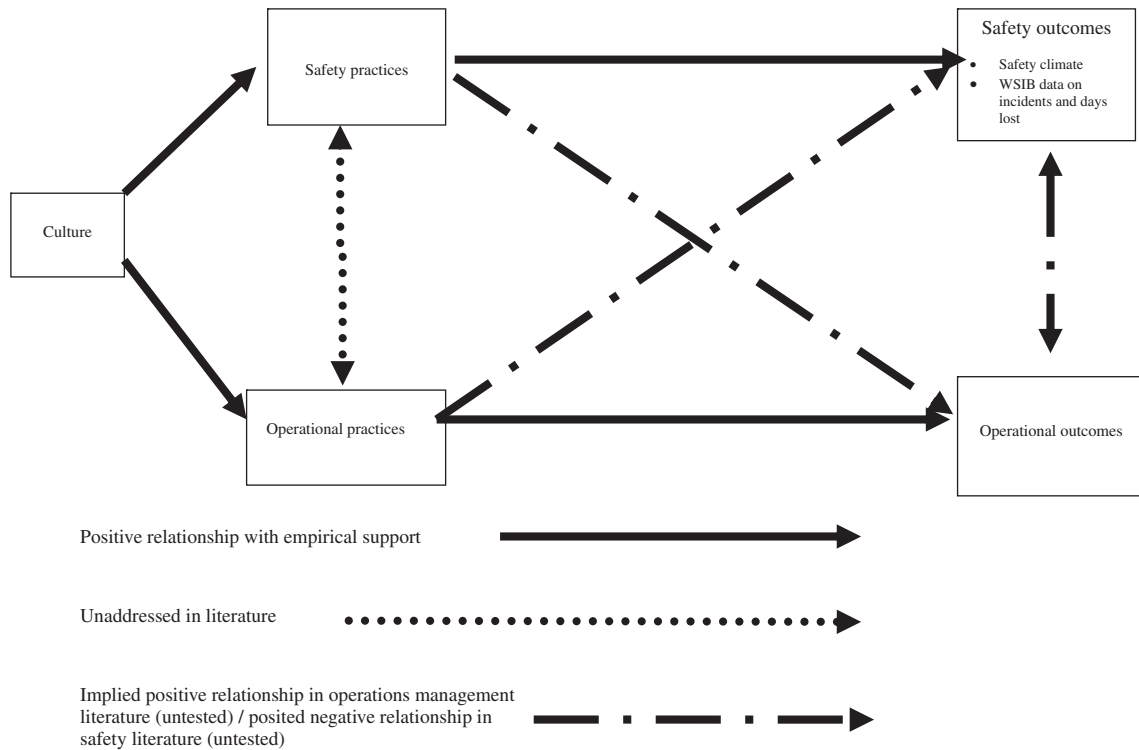


Fig. 1. what is known about the relationships of interest based on the literature.

The present research addresses this gap and is a response to the numerous calls to better understand the competitive implications of safety (American Society of Safety Engineers, 2002; European Agency for Safety and Health at Work, 2010; NIOSH, 2009; WSIB, 2001) by simultaneously examining safety practices and outcomes alongside business practices and outcomes. By employing a multi-stakeholder perspective and a level of analysis centered on an individual plant or facility, this research empirically examines safety practices and outcomes in the wider organizational context of business operations and sets out to answer the following questions:

- RQ1: What are the relationships between operational practices and safety practices?  
 RQ2: What are the relationships between safety practices and operational outcomes (beside safety)?  
 RQ3: What are the relationships between operational practices and safety outcomes?  
 RQ4: What are the relationships between safety outcomes and other operational outcomes?

Fig. 1 shows what is known and (generally) unknown about these constructs of interest. The aims of the research include enhancing the understanding of the practices critical for safe workplaces and of the business value (positive or negative) of safety.

## 2. Literature review

Safety and Operations have each developed into mature areas of research and practice. Yet seemingly lost in both literatures is that fact that the managers and workers being addressed by safety and operational management systems are often the same people working in the same space and facing the same risks. Workers and managers must simultaneously address safety and operational issues.

While the safety literature identifies key policies and practices to protect or enhance workers safety (Cohen, 1977; Smith et al., 1978; Habeck et al., 1998; Shannon et al., 1997, 2001; Vredenburg, 2002; Mearns et al., 2003), it rarely empirically addresses how the policies and practices relate to other business practices or outcomes, especially economic outcomes (Tompa et al., 2009; Neumann and Dul, 2010). Consequently, this literature comes to multiple conclusions as to the relationship between being safe and being productive.

A primary conclusion of the safety climate literature is the supposition that there is a trade-off between outcomes such as safety, which will be valued most by stakeholders such as the workers themselves, and profits, which will be valued most by managers and owners (e.g. Zohar, 2002; Zohar and Luria, 2005; Pate-Cornell and Murphy, 1996). Zohar (2000) posits that there is a trade-off between organizational goals such as quality improvement and cost reductions and safety goals such as accident reduction. Ford and Tetrick (2008) hypothesize that workers either avoid errors (safety in their parlance) or maximize production but they cannot do both. Short cuts will be taken to work around the safety system to allow production goals to be met. This assumes the safety “short cuts” maximize production without other business outcome consequences. However, recent research in operations management would predict that when organizations take shortcuts that put safety at risk they may also be putting other operational outcomes at risk (Das et al., 2008). The supposition remains untested.

The rare safety literature addressing the operational/economic benefits of safety has concluded that safety interventions usually, but not always, provide other operational benefits. Neumann and Dul (2010) reviewed the human factors/ergonomics literature and concluded that while research in ergonomics with an operational/economic focus was exceedingly rare, what had been conducted found a positive relationship between improving ergonomics and other operational outcomes. Tompa et al. (2009) reviewed a broader literature describing the economic

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