



Improving safety culture through the health and safety organization: A case study[☆]

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ABSTRACT

Introduction: International research indicates that internal health and safety organizations (HSO) and health and safety committees (HSC) do not have the intended impact on companies' safety performance. The aim of this case study at an industrial plant was to test whether the HSO can improve company safety culture by creating more and better safety-related interactions both within the HSO and between HSO members and the shop-floor. **Methods:** A quasi-experimental single case study design based on action research with both quantitative and qualitative measures was used. **Intervention:** Based on baseline mapping of safety culture and the efficiency of the HSO three developmental processes were started aimed at the HSC, the whole HSO, and the safety representatives, respectively. **Results:** Results at follow-up indicated a marked improvement in HSO performance, interaction patterns concerning safety, safety culture indicators, and a changed trend in injury rates. These improvements are interpreted as cultural change because an organizational double-loop learning process leading to modification of the basic assumptions could be identified. **Practical applications:** The study provides evidence that the HSO can improve company safety culture by focusing on safety-related interactions.

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1. Introduction

1.1. Safety culture

There is a conspicuous lack of culture change intervention studies in the safety literature (DeJoy, 2005; Hale, Guldenmund, van Loenhout, & Oh, 2010), which might be due to the fact that the theoretical framework for safety culture generally is underdeveloped and the link to research on organizational culture has been weak or even nonexistent (Choudhry, Fang, & Mohamed, 2007; Clarke, 2000). There is, for instance, no widely accepted model of safety culture or any consensus on how to define or describe the safety culture of an organization. Therefore, the concept of safety culture is vague and not easily translated into change efforts. One possible way to remedy this is to see safety culture as an integrated part of the more general concept of organizational culture. Specifically, safety culture can be understood as the aspects or parts of the organizational culture that influence attitudes and behaviors, which have an impact on the level of safety in the organization (Hale, 2000).

Schein (1990, 2004) defines organizational culture as a pattern of shared basic assumptions that a group has learned as it solved issues of external adaptation and internal integration. These basic assumptions

are not readily observable or measurable as they are unconscious, taken-for-granted beliefs that are the ultimate source of values and actions. In Schein's understanding basic assumptions are similar to 'theories-in-use' (Argyris & Schön, 1996), which are the implicit assumptions that actually guide behavior. The identification of these basic underlying assumptions is not easy. It is an analytical process based on the two other cultural layers that are more accessible: artifacts (visible organizational structures and processes that are easy to observe but hard to decipher) and espoused beliefs and values (strategies, goals and philosophies that serve as the espoused justifications for actions and are similar to 'espoused theories' (Argyris & Schön, 1996)).

Schein argues that organizational culture can be changed intentionally given the right circumstances and initiatives. Culture is seen as a stabilizing force that serves an anxiety reducing function, as it gives people a frame of reference for how to act, think, and feel in new situations. In that sense culture is a learned defense mechanism against uncertainty and change (Schein, 2004). Therefore, cultural change is an anxiety-provoking process that is only undertaken if there is a large enough motivation to change. This might be the case if the organization senses a large enough threat, crisis, or dissatisfaction with the current state of affairs to warrant a change in its basic assumptions. Such deep change requires double-loop learning rather than single-loop learning (Argyris & Schön, 1996), which only changes the outer layer of the culture.

1.2. Using safety climate to change safety culture

The fuzziness of the culture concept and the unconscious nature of the basic assumptions make it difficult to influence culture directly. One way

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to approach culture change could be by looking at the related concept of climate, which describes the shared perceptions of organizational policies, practices, and procedures, both formal and informal (Reichers & Schneider, 1990). The differences (or lack of difference) between the climate and culture concepts have been widely debated both within organizational theory and safety science (Guldenmund, 2000; Reichers & Schneider, 1990). However, although both concepts are understood as some sort of shared perceptions that are created over time, culture is generally seen as a more abstract and stable construct than climate, that more easily lends itself to manipulation (Guldenmund, 2000). In Schein's understanding, organizational climate is a surface manifestation of the deeper cultural levels and a reflection of leaders' attempts to embed culture (Schein, 2004). Thus, climate can be seen as an entrance door to work with culture, as it is a visible (and more measurable) concept that is tied to the creation of culture.

Within safety science, Dov Zohar has proposed that safety climate is formed by the workers' perception of the relative priority of safety versus efficiency goals in supervisory practices (Zohar, 2000). Theoretically, this installs supervisory safety practices as a link between safety climate and culture. Supervisory practices are guided by supervisors' basic assumptions (culture) and are taken as guiding principles for employee actions as they are perceived by employees (climate). Of course, not every supervisory practice is directly guided by basic assumptions, as many other behavioral influences exist. However, the formation of climate and culture is not rooted in any single instance of supervisory practice, but relates to the general pattern of priorities in supervisory practices over time. Thus, creating a sustained change in supervisory practices becomes a way to put safety climate and culture change into practice.

This approach to change is primarily leader-based, as it focuses on changing supervisory practices, which is in accordance with Schein's (2004), Zohar (2000, 2002a, 2002b), and Zohar and Luria (2003) emphasis on the pivotal role of leaders in creating cultural and climate change. This is not surprising, as management's commitment to safety is generally acknowledged as a fundamental aspect of successful safety performance (O'dea & Flin, 2001; Rundmo & Hale, 2003; Simard & Marchand, 1995). However, neither organizational nor cultural change is a prescriptive linear top-down process. Rather it involves unpredictable complex social processes (Dooley, 1997). It has recently been suggested to apply insights from complexity theories to safety (Rosa Antonia, 2011), and although there exist no unified complexity theory or approach (Horgan, 1995), complex adaptive systems theory delivers a comprehensive understanding of organizational change (Dooley, 1996, 1997). Within complex adaptive systems, theory interactions are seen as the driver of organizational change, which is in agreement with Zohar's emphasis on the daily interactions between management and workers as the building blocks of climate change. However, complex adaptive systems theory states that control over such changes lie in the organization as a whole and not within any single individual (e.g., the leader; Dooley, 1996). Complex adaptive systems theory focuses on the unpredictable and uncontrollable nature of change processes and self-organization takes center stage in the change process (Dooley, 1996, 1997). Self-organization is seen as a process by which novel and unpredictable order emerges from the interactions between distinctive agents. Hence, leaders are not in full control of change processes and cannot predict the outcome of changes. Thus, change cannot be implemented top-down, but instead emerges out of the pattern of interactions between the individuals in the organization. However, leaders have the opportunity to influence the change process at the macro-level by enabling or restricting the possibilities for individuals to interact, and thereby catalyze, create, or hinder relationships (Marion & Uhl-Bien, 2001).

Hence, by combining theories on organizational culture, (safety) climate and complex adaptive systems, it is feasible that cultural change can be created by changing the pattern of interactions between organizational members.

1.3. Health and safety organizations and committees

In many organizations the health and safety organization (HSO) or committee (HSC) is placed as the pivotal point of organizational safety efforts and could therefore be the natural breeding ground for safety culture change. However, as there is no uniform international legislation regarding the establishment of HSOs or HSCs, it is difficult to compare experiences between countries. Most research on the effectiveness of HSCs has been conducted in the United States (Milgate, Innes, & O'Loughlin, 2002) and although evidence from there indicate that HSCs tend to have a positive effect on company safety performance (Parker et al., 2007; Smitha, Kirk, Oestenstad, Brown, & Lee, 2001), international evidence suggests that HSCs have had difficulties in promoting safety (Frick & Wren, 2000) and that the creation of HSCs does not have an effect on injury rates in itself, but depends on the structure (size and composition), process (participation, involvement), and activities (executive functions and training of committee members) of the committee (Geldart, Smith, Shannon, & Lohfeld, 2010; Liu et al., 2010; Morse, Gozueta, Curry, & Warren, 2008). Likewise, a review of international studies on the effectiveness of HSCs concludes that fundamental factors for effective performance include management commitment, communication, the inclusion of safety on the everyday management agenda, committee processes (frequency of meetings, size of committee and problem solving ability), and the involvement of professional experts (Milgate et al., 2002).

In Denmark the Danish Work Environment law specifies how HSOs and HSCs are to be structured. At the time of this study companies with more than five employees were obliged to establish a HSO. The HSO consisted of a representative of top management and so-called 'safety-groups' made up of an employee-elected safety representative and a supervisor for each major work area. The safety-groups should handle the daily safety-issues within their work area. Furthermore, companies with more than 20 employees were obligated to establish a HSC, as a subgroup within the HSO, consisting of the representative of top management and typically two safety representatives and two supervisors (if a company had less than three safety-groups then the HSC would equal the HSO). The HSC should meet four times a year to discuss company safety issues, and two of these meetings should include all members of the HSO.

The most common problems with the HSOs in Denmark are their dependence on a few highly committed individuals, a reactive approach, and a lack of systematic action (Hasle & Langaa Jensen, 2006). At the same time the HSO often lacks integration within the core activities of the company (i.e., production), which in turn leads to insufficient managerial attention. This lack of integration might partly be due to the fact that the creation, structure, and function of the HSO in Denmark is based on national legislation and not on an assessment by company management of how company safety issues are most effectively managed. As such the HSO is created in parallel to the formal organization of the company, which is (typically) formed around the production process. This might push the HSO into a side-car role, where safety issues are deliberately disengaged from production issues, because of the existence of the HSO. This is actually the opposite of the intention of the legislation, but de facto often the case.

1.4. Aim

The aim of the current study is to test whether the HSO can improve company safety culture by creating more and better safety-related interactions both within the HSO and between HSO members and the shop-floor. This is done by starting three developmental processes in the company aimed at the HSC, the whole HSO, and the safety representatives, respectively. The hypothesis is that these developmental processes will create a more active and visible HSO engaging in more and better safety-related interaction, which in turn should result in improvements in safety culture indicators.

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