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Safety culture and reasons for risk-taking at a large steel-manufacturing company: Investigating the worker perspective

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ABSTRACT

Workers in the steel-manufacturing industry face many safety risks due to the nature of the job. How well safety procedures and regulations are followed within an organization is considered to be influenced by the reigning culture of the organization. The aim of this study was to investigate and describe safety culture and risk-taking at a large steel-manufacturing company in Sweden by exploring workers' experiences and perceptions of safety and risks. Ten focus group interviews were conducted with a total of 66 workers. In the interviews, the situation of safety at work was discussed in a semi-structured manner. The material was analyzed inductively using qualitative content analysis. The analysis resulted in a thorough description of safety culture and risk-taking at the company, based on the following five main categories: 1. *Acceptance of risks*, one simply has to accept the safety risks of the work environment, 2. *Individual responsibility for safety*, the responsibility for safe procedures rests to the largest extent on the individual, 3. *Trade-off between productivity and safety*, these are conflicting entities, wanting to produce as well as wanting to work safely, 4. *Importance of communication*, it is needed for safety actions to be effective, and 5. *State-of-the-day and external conditions*, an interplay between these factors affect risk-taking. In sociotechnical systems theory it is acknowledged that there are interactions between social and technical factors in organizations. The findings of this study are interpreted to be in line with a sociotechnical understanding of safety culture and risk-taking.

1. Introduction

Steel manufacturing is an industry where safe working procedures are important, as workers face many risks due to the nature of the job. The work environment is often hot and noisy, and work tasks regularly heavy and demanding on the body, and there is an always present risk for crushing injuries and burns. Figures from Sweden show that metalworkers were subjected to the largest number of accidents annually (2006–2010) compared to other occupations (AFA Insurance, 2012). The risk for new cases of long-term sick leave (>90 days) for metalworkers was more than double that of the average worker (AFA Insurance, 2012). Metalworkers also had the largest number of cases of recognized work-related diseases among Swedish occupational groups during 2008 and 2009, with 0.7 cases per 1000 employed (AFA Insurance, 2012). Due to the types of risky workplaces that steel manufacturing plants constitute, the companies need to assure safe working conditions through systematic and regular safety audits and risk analyses (AFS, 2001; SFS, 1977; 89/391/ECC). Safety procedures and regulations need to be followed by the management as well as the workers.

How well safety procedures and regulations are followed within an organization is considered to be influenced by the reigning culture of the organization (Antonsen, 2009a; Guldenmund, 2010; Hopkins, 1999). Organizational accidents have been associated with a poor safety culture, as, for example, in the two space shuttle accidents and the Chernobyl nuclear disaster (CAIB, 2003; IAEA, 1992; Vaughan, 1996). Safety culture is regularly mentioned as an important concept in understanding the state of safety in organizations, and is thereby thought a relevant phenomenon to study (Choudhry et al., 2007; Edwards et al., 2013; Mearns and Flin, 1999). Because of the risks and the importance of safety in the steel-manufacturing context, the focus of the present study is to examine safety culture and risk-taking in the steel-manufacturing industry.

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The concept of safety culture has been defined in many ways over the years and there is no established definition (Choudhry et al., 2007; Edwards et al., 2013; Guldenmund, 2010). There is a necessity to return to the roots of *culture* in order to gain a better understanding of what is meant by safety culture (Antonsen, 2009b; Edwards et al., 2013; Haukelid, 2008; Myers et al., 2014). A known sociological definition is that "Culture consists of the **values** the members of a given group hold, the **norms** they follow, and the *material goods* they create" (Giddens, 1989, p. 31). Values are "abstract ideals," perceptions of what is right and wrong and how things should and should not be (Giddens, 1989, p. 31). Norms are "definite principles or rules which people are expected to observe," the rules governing social conduct and the behaviors that are accepted or not (Giddens, 1989, p. 31). Values and norms are learned by socialization—humans learning from others in groups; hence culture is learned by socialization. Safety culture can be understood as "an analytical concept, not an empirical entity" (Antonsen, 2009a, p. 243), meaning that safety culture is a label that represents the relationship between culture and safety, and not a separate entity on its own. In line with Giddens's (1989) definition of culture, Mearns and Flin (1999) described safety culture as normative beliefs and fundamental values, assumptions, expectations, philosophies, norms, and rules, with regard to safety at a workplace. Earlier studies on safety culture have applied the concept to organizations in two different ways: (1) by assuming that every organization has a safety culture (and that it therefore can vary in the extent to which it is strong/positive or weak/negative), or (2) by assuming that it is organizations that are really committed to safety that have a safety culture (Hopkins, 2006). This study agrees with the first description, that every organization has a safety culture that may affect safety.

Some earlier studies on safety in a steel-manufacturing context have focused on behavior, attitudes, climate, or culture, with results indicating that culture can form a basis for unsafe attitudes and behavior (Brown et al., 2000; Canter, 1996; Turtiainen and Vaananen, 2012; Watson et al., 2005). Both negative and positive examples of safety culture are described in previous research. In a study of a coal mining accident it was found that two unfortunate cultural expressions paralyzed the organization's ability to acknowledge warning signs before the accident occurred. The first was the "belief that it was important to rely on personal experience in assessing the evidence" (Hopkins, 1999, p. 148) and therefore to systematically discount the reports of others, and the second was "a culture of denial, an elaborate set of beliefs which held that 'it could not happen here'" (Hopkins, 1999, p. 141). In contrast to this, three of the most important cultural expressions for achieving an adequate safety culture have been found to be "looking for errors, not keeping out of sight when difficult situations arise, and resolving conflicts constructively" (García-Herrero et al., 2013, p. 94). Management's commitment to safety stands out among earlier findings as a key factor associated with positive safety culture, positive employee safety behavior, and positive employee safety attitudes (Biggs et al., 2013; Cox et al., 1998; Fernández-Muñiz et al., 2007). Workers' belief in the safety values of the management has been linked to predicting worker risk behavior (Watson et al., 2005). The concept of risk is defined as "the possibility that something unpleasant or unwelcome will happen," and as a verb, risk means to "expose (someone or something valued) to danger, harm, or loss" (Oxford Dictionaries, 2013). Norms shared by employees have been shown to predict perceptions of safety as well as risk behavior (Watson et al., 2005). Other key factors that have been shown to be associated with an organizations' safety culture are the employee involvement and personal actions for safety (Cox et al., 1998; Fernández-Muñiz et al., 2007); the quality of employee safety training (Cox et al., 1998); and the safety management system (Fernández-Muñiz et al., 2007). It has been shown that workers manifest less ambivalence toward using personal protective equipment when they perceive that there is an atmosphere in the organization that supports safety (Cavazza and Serpe, 2009). It has been shown that it is possible to change a safety culture, as exemplified in an oil-drilling context; however, it takes a long time (Haukelid, 2008).

Safety culture has earlier been studied using three main directions of methodology: perception surveys (questionnaires), ethnography, and assembled material from major accident inquiries (Hopkins, 2006). Relatively few empirical studies on safety culture have, so far, used qualitative methodology (Glendon, 2008; Guldenmund, 2010). A qualitative methodology considered as suitable when investigating cultural values and group norms is focus group interviewing (Hughes and DuMont, 1993; Kitzinger, 1995). Culture is a complex phenomenon to study. With perception surveys (questionnaires) it is possible to study safety culture from one viewpoint; with a qualitative study approach it is possible to do it from another, enabling a more detailed and in-depth description, which can be done inductively. It has been suggested that the concept of safety culture is best suited to be understood in a specific context (Richter and Koch, 2004). The context of the present study is steel manufacturing. As this is a high-risk work environment, there is a need to improve the safety of the work conditions for steelworkers. One way to achieve this is to improve the understanding of safety culture and risk-taking in this context. Safety rules and regulations at the workplace are formalized norms, and officially expressed. To expect compliance with rules is a certain kind of communication—it is a request (Cialdini and Trost, 1998). The more compliant workers are with safety rules, the better the safety culture is thought to be (Simard and Marchand, 1997). This investigation however, focuses on values and norms of safety that are not written down, not officially expressed, informal norms, but which—socially, in any case—influence safety actions and behavior. In a best-case scenario, the formal and informal norms in an organization match up, in that it is specified by the culture that it is important to comply with safety rules and not to violate them. However, regardless of formal or informal, in order for norms to have any effect on behavior they need be communicated between humans—they need to be shared, otherwise they do not exist (Cialdini and Trost, 1998).

The aim of the present study was to investigate and describe safety culture and risk-taking in the steel-manufacturing industry by exploring workers' experiences and perceptions of safety and risks.

2. Material and methods

2.1. Study design

The present study was designed to be a descriptive focus group interview study, with an inductive and explorative approach. Focus group interviewing was used, as it is a method considered appropriate when aiming to explore cultural values and group norms, by identifying shared knowledge and experiences within groups (Hughes and DuMont, 1993; Kitzinger, 1995). Qualitative content analysis was used in the analysis of data (Graneheim and Lundman, 2004).

2.2. Study context: A steel-manufacturing company

The present study took place at a large steel-manufacturing company in a county in central Sweden. The company exemplifies a typical industrial works community that one finds in many smaller towns in Sweden, where the works has played a central