



# Does the concept of safety culture help or hinder systems thinking in safety?



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## ABSTRACT

The concept of safety culture has become established in safety management applications in all major safety-critical domains. The idea that safety culture somehow represents a “systemic view” on safety is seldom explicitly spoken out, but nevertheless seem to linger behind many safety culture discourses. However, in this paper we argue that the “new” contribution to safety management from safety culture never really became integrated with classical engineering principles and concepts. This integration would have been necessary for the development of a more genuine systems-oriented view on safety; e.g. a conception of safety in which human, technological, organisational and cultural factors are understood as mutually interacting elements. Without of this integration, researchers and the users of the various tools and methods associated with safety culture have sometimes fostered a belief that “safety culture” in fact represents such a systemic view about safety. This belief is, however, not backed up by theoretical or empirical evidence. It is true that safety culture, at least in some sense, represents a holistic term—a totality of factors that include human, organisational and technological aspects. However, the departure for such safety culture models is still human and organisational factors rather than technology (or safety) itself. The aim of this paper is to critically review the various uses of the concept of safety culture as representing a systemic view on safety. The article will take a look at the concepts of culture and safety culture based on previous studies, and outlines in more detail the theoretical challenges in safety culture as a systems concept. The paper also presents recommendations on how to make safety culture more systemic.

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## 1. Introduction

The idea that safety culture somehow represents a “systemic view” on safety is seldom explicitly spoken out, but nevertheless seems to linger behind many safety culture discourses. However, we argue that safety culture as it is currently used is not a systems-oriented concept. We argue that the “new” contributions to safety management brought about by the concept of safety culture have never really become integrated with classical engineering principles and concepts. This integration would have been necessary for developing a more genuine systems-oriented view on safety; for example, a conception of safety in which human, technological, organisational and cultural factors are understood as mutually interacting elements, or subsystems. In lack of this integration, researchers and the users of the various tools and methods associated with the concept of safety culture have sometimes fostered a belief that “safety culture” in itself represents such a systemic view

about safety. This belief is, however, not backed up by theoretical or empirical evidence. The present article is an attempt to elaborate on the question: Has safety culture research and practice missed the opportunity to integrate with systemic perspectives?

The historical background on which our further arguments are based is the following: when it was fully realised that safety as a dynamic state represents something more than just technology, more and more attention was directed towards “the human factor”. However, the human factor was often treated metaphorically as an “error prone machine” rather than an intentional and meaning-seeking subject. Introducing the concepts of “organisational factors” and later “safety culture” introduced more conceptual complexity but also an enhanced understanding of why safety-related events may occur, and more attention to other types of threats than those that had been studied in technology and individually oriented human factors research. Systemic theories represent one possible analytical framework to make sense of a complex reality, and such theories can (and have been) utilised in safety science. However, we will argue that the safety culture movement largely failed to make full use of systemic theories in the sense of recognising some of the basic principles common to system

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theories. We have seen several indications on this based on a review of the literature about safety culture but also supported by direct experiences from research and consultancy work. The remainder of this article will elaborate on this issue. We will first take a look at the concepts of culture and safety culture. Then we will outline in more detail the theoretical challenges in safety culture as a systems concept. Finally, we will present some recommendations on how to make safety culture more systemic.

## 2. Culture and safety culture

### 2.1. Concept of culture

The concept of culture is associated with many meanings. Good overviews of the origins, developments and controversies of the concept of organisational culture have been written by [Alvesson \(2002\)](#) and [Martin \(2002\)](#). In general, it is possible to distinguish between two broad ideas about culture in an ontological and epistemological sense: interpretative and functionalist approaches ([Smircich, 1983](#)).

*Interpretative approaches* to culture share an interest in the meanings and beliefs that the members of an organisation assign to organisational elements (structures, systems and tools) and how these assigned meanings influence behaviour ([Czarniawska-Joerges, 1992](#); [Weick, 1995](#); [Alvesson, 2002](#); [Reiman and Oedewald, 2007](#)). Culture in these approaches can be considered a (research) framework for conceptualising the organisation and inspecting various phenomena perceived in the context of the organisation. Culture acts as a metaphor for the organisation; *organisation as a culture*. According to [Alvesson and Berg \(1992, p. 78\)](#), culture as a root metaphor for the organisation means that ‘the cultural dimension can be found in – and not “alongside” – formal organisational structures, administrative systems, technologies, strategies’. In other words, the reality in which the work takes place is socially constructed.

The term “social construction of reality” was introduced by sociologists [Berger and Luckmann \(1966\)](#). They proposed a theory of society based on the ideas of Alfred Schutz, Karl Marx, Émile Durkheim and George Herbert Mead. Berger and Luckmann argued that human beings continually and together construct the social world that then becomes the reality to which they respond. According to these scholars, social order is an ongoing human production. The individual is thus in a dialectic relationship with society; simultaneously constructing and being constrained by it. In the social constructionist approach, culture is considered to be embedded in the social processes and practices of the organisation. It is not an element that can be considered, analysed and evaluated independently of context, since culture is the context.

The *functionalist approaches* build on the seminal work of scholars such as [Parsons \(1951\)](#), [Durkheim \(1982\)](#) and [Radcliffe-Brown \(1958\)](#) on the nature of social systems. According to functionalists, organisational culture includes aspects that are shared by all members and that contribute to the social integration and equilibrium of the system. While interpretative approaches treat an organisation as a culture, functionalist approaches view culture as a variable, i.e. that an *organisation has a culture*. Notable proponents of this view on organisational culture include [Ouchi \(1980\)](#), [Schein \(1985\)](#), [Kilmann \(1985\)](#), [Wilkins and Ouchi \(1983\)](#) and [Barney \(1986\)](#).

[Schein \(1985\)](#) has defined the deepest layer of organisational culture as a pattern of basic assumptions that the group has invented as it has learned to cope with its problems related to adapting to its environment and integrating the group into a functioning whole. This pattern of basic assumptions has worked well enough to be considered valid, as it is taught to new members of the organisation as the correct way to perceive, think, and feel in

relation to those problems ([Schein, 1985](#)). Such basic assumptions are largely taken for granted. They deal with issues of time perspective, the nature of the company’s relationship with its various stakeholders, ways of responding to critique, criteria for rewarding and punishing people and so on. In safety-critical fields basic assumptions may concern issues such as what constitutes risk, the main hazards the organisation is dealing with, how one is supposed to speak about risks in the workplace, and what is a valid warning signal that things are risky, for example. The main notion here is that culture is something the company has created for itself, and has an effect on the company. This effect is not necessarily perceived by the company itself, since the members of the organisation consider all things that happen according to cultural taken-for-granted assumptions (“business as usual”). Further, culture has several levels, with artefacts (visible behaviour, technology, etc.) presenting the surface level of culture. Schein’s model was influenced by open systems theory ([Katz and Kahn, 1966](#)) as well as the structural functionalism approach by [Parsons \(1951\)](#).

At first, Schein had quite a singular view of organisational culture, but he has since supplemented his theory with ideas of subcultures existing within each organisational culture ([Schein, 2004](#)). Most cultural approaches today acknowledge the existence of at least three types of subculture: a) occupational or professional subcultures based on educational background of the employees, b) departmental subcultures based on the work unit in question, and c) age or tenure related subcultures (see e.g. [Parker, 2000](#)). Despite wide acceptance, the ontological status of subculture is not always clear: is subculture an independent entity or do the subcultures together form a unique organisational main culture? Further, how do the different layers or elements of each subculture interact with other subcultures? The general notion of subculture is vague because it is not always clear on what grounds a subculture is defined. For example, a subculture can be defined in terms of professional groups that transcend a specific organisational boundary (medical doctors, pilots, etc.) or it can be defined in terms of groups according to an organisational chart, or it can be defined as a specific focus domain among others (safety culture, innovation culture, service culture, etc.) or even in terms of things such as age (youth culture). Many of these ambiguities can be found in the application of the culture concept in the safety domain.

### 2.2. Previous studies on culture and safety

The safety culture concept was born in the aftermath of the Chernobyl accident in 1986, when it became clear that nuclear safety should incorporate more than mere technology. After the accident, various human and organisational issues complemented the then dominant technological and rather narrow human factors view on nuclear safety. Cultural issues also rapidly spread into other areas of safety. Management systems, leadership and a host of other human related factors such as learning, responsibility, values and attitudes were taken into consideration (with varying operationalizations) in safety analyses and development initiatives. The concept of safety culture has today become established into safety management applications in all major safety-critical domains, such as aviation, nuclear power production, petrochemical sector (including offshore oil production), railways, peacetime military operations, maritime, and mining operations.

Safety culture quickly became a popular term despite the fact that a somewhat similar concept, “safety climate”, had already been introduced ([Zohar, 1980](#)). Safety culture development drew more on the organisational culture literature than the safety climate literature. Nowadays the two concepts of safety culture and safety climate are associated with different definitions, research traditions and methods ([Zohar, 2000](#); [Clarke, 2000](#); [Neal and Griffin, 2002](#)). Safety climate is often described as consisting of shared

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