

# Literature Review on the Value of Safety and Safety as a Value

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## 1 Introduction

There is a growing attention for the value of safety and safety values. This can be illustrated by the recent European Guideline for the oil and gas industry, whereby that industry is required to have 'safety as a core value' (EC 2013/30). The International Atomic Energy Agency (2009) also puts an emphasis on the importance of safety 'as a clearly recognized value'.

As there is no generally accepted definition of the value of safety, or a safety as a value, the VALOSA project aims to fill that gap.

The purpose of this paper is to review the scientific literature on the value of safety, and safety as a value. Safety can thereby be a value for organizations, for individuals (e.g. managers or, workers) and for society at large. There are quite few peer-reviewed scientific publications on the value of safety, other than the economic value. In fact, the value of safety seems and safety values are implicit in most safety research (as the aim is usually to somehow contribute to the improvement of safety). However, it is only very seldom explicitly addressed in the scientific literature. Therefore we have included also some not peer-reviewed publications in this review.

Many companies describe safety as their top priority but that does not necessarily mean that safety is a (core) value? Values are operating philosophies or principles that guide an organization's internal conduct as well as its relationship with the external world. Values provide guidance for people on what is good or desirable and what is not. This means that values are more stable and can be expected to have a more sustainable impact on safety than safety as 'just a priority'.

In this literature review we first focus on the value of safety and safety values. Though there is not yet an accepted consensus on what the safety value is, there are still some literatures wherein practical issues with respect to safety values are mentioned. While it is likely that the respective authors give different meanings to the concept of 'the value of safety' it seems nevertheless relevant to give an overview of literature on the impact of safety values on daily routines, and on factors relevant for implementation.

The annex includes the list of publications which were used in preparing this review. Some key points of the publications are also provided.

## 2 Values

There are many different definitions of values. However, when speaking about safety values, the number of definitions is more limited. There is no unanimously accepted definition of safety values.

Values are defined by Milton Rokeach as "core conceptions of the desirable within every individual and society" (Crowe, 1995). On the other hand, Colley et al. (2013) defined values as beliefs regarding what is important, either for individuals, or for the organization as a whole. Ravlin (1998) includes also the social learning in the definition when describing that values are "constant set of core beliefs held by individuals concerning how they should or ought to behave over a broad range of situations" which are difficult to change in adulthood, but can through the socialization processes experienced during life.

In an earlier study Zwetsloot et al. (2013b) have listed the definitions for value.

*"According to the Oxford dictionary (2015) values are the "principles or standards of behavior; one's judgment of what is important in life". According to the glossary terms of the excellence model of the European Foundation for Quality Management (2015) values are "operating philosophies or principles that guide an organization's internal conduct as well as its relationship with the external world. Values provide guidance for people on what is good or desirable and what is not. They exert major influence on the behavior of individuals and teams and serve as broad guidelines in all situations". According to the Cambridge dictionary (2015) a "core value is a value or belief that is more important than any other"."*

*Core values "underlie the organization's mission, vision, and strategies, but also the design and functioning of their systems, structure, style of operation, and the selection and development of staff and skills (Peters & Waterman 1982); they have the potential to guide the practices and behaviors of managers, supervisors, and workers. When internalized, core values are more stable than corporate structures or management systems, especially in periods of reorganization and change."*

This shows a great potential if safety is really a shared (core) value in organisations.

Values are motivational elements (Ravlin 1998). They give a reason to desire one alternative over another.

Keller, Bouchard, Arvey, Segal and Davis (1992) have shown in their work value study that 40% of the variance in measured values of individuals was related to genetic factors, and 60% of the variance was associated with environmental factors and error variance. This means that the values of individual people can be influenced significantly by environmental factors, but also that there are also personality factors that cannot be influenced.

Organizations can set safety as a priority but that does not automatically include the value of safety, certainly not for all individuals. However, systematic and consistent prioritizing safety can be seen as a tool for sharing values and encouraging members of the organization to acquire them.

Values are learned from others but after that strengthened and molded by individual's experiences and values can be changed through socialization.

### 3 The value of safety and safety values

One can state that safety is a value in itself (Zwetsloot et al. 2013b). There are good reasons to say that safety at work represents a value in themselves. Safety certainly belongs to what most people judge to be important in life (which was part of one of the definitions of a value, given above), (Zwetsloot et al. 2013b). However that does not give us a definition or further insight into the value of safety, or safety values.

US OSHA quotes in their White paper on Injury and Illness Prevention Programs (OSHA 2012) the CEO of Parsons cooperation: *Establishing safety as a value rather than a priority tells our employees and our customers that safety is built into our culture, not something we do to merely comply with regulations.*

Zwetsloot et al (2013a) call the 'zero accident vision' the only ethically sustainable long-term goal for safety management, while the ILO declared that the protection of health and safety at work is fundamental right, related to the Declaration of Human Rights. That was confirmed by the United Nations International Covenant on Economic, Social and Cultural Rights in 1976 (Alli 2008).

Value of safety is expressed through the organization's safety policies, practices, and procedures (Sinclair et al., 2010). In safety-critical organizations framework supplied by value-focused thinking helps to understand decisions made by operators (Merrick et al., 2005).

Cooper (2001) has stated that the idea of 'safety is a value' is based on the "fundamental philosophy that all injuries are preventable and that the goal of zero injuries can be achieved"

Safety values are defined by Newman and her co-workers (2012) as the importance associated with safety within an organization. According to Newman et al safety values are predictors of the safety information exchange between supervisors and employees. Newman and her co-workers (2008) concentrated on intrinsic value of safety, rather than extrinsic motivators, such as rewards and punishment.

Perceptions of workplace safety values are transmitted across levels of the organization. Fu and Chan (2014) defined safety values at Taipei International Airport as safety practices which are implemented even under the pressure of completing tasks.

The Robert W. Campbell Award recognizes organizations that achieve business excellence by integrating environmental, health and safety (EHS) management into their business operating systems (see table).

#### **Recognizing Business Excellence in Safety and Health**

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- Use a rigorous systematic review process to capture and evaluate the successes and lessons learned.
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## 4 Safety related supporting values

According to Reason [1997], a characteristic of a positive safety culture is a 'just culture': an atmosphere of trust that encourages people to deliver OSH relevant information and where everybody knows what is acceptable and unacceptable behavior. Justice and reliable information, even if it is bad news, generates credibility and confidence in safety management. Reason also emphasized the importance of informedness and trust as values that are necessary elements of a good safety culture. (Reason 1997).

Dierdorf and Morgeson (2013) wrote that achievement (accomplishment and utilization of one's abilities), independence (reinforcement and stimulation initiative and creativity), altruism (fostering harmony and service to others), status (advancement, recognition and prestige), and comfort (supportive and free from stress) were safety-related values. On the

other hand, Colley and Neal (2012) had identified 42 concepts across a series of interviews, which were indicators of the value and importance that ascribed to safety

Gregory et al. (2009) mentioned five culture domains, associated with competing values:

1. Group culture, which included belonging to the group, cohesiveness, participatory decision making, and support from co-workers,
2. Development culture: flexibility and adaptation
3. Rational culture considering goal attainment, productivity, achievement and competition
4. Hierarchical culture: internally focused control, job security
5. Balanced culture including values associated with each domains are strongly held.

The basic values of security cover an emphasis on safety, harmony, and stability (Hystad & Bye, 2013).

In the book of Townsend (2013) there is attention to safety values and beliefs. He analyses the values and beliefs of 11 companies and the HSE, based on the companies' CSR reports and the HSE report. Based on the idea that a value is what is important to the organization, he regards statements like "injuries are unacceptable" as a value. As a follow-up Townsend analyses how consistent they then translate these values into "key themes and concepts" i.e. commitment, audits, worker/staff behavior, competency, communication, skills, ability and proficiency, shared values and attitudes, motivation, and mutual trust and reciprocal dialogue.

Zwetsloot et al. (2013b) identified twenty-nine values and value related factors that are described in the literature as supportive to Health, Safety and Well-being at Work. These were clustered around seven core values. These seven core values were then grouped in three value clusters. The first value cluster is characterized by a positive attitude toward people and their 'being'; it comprises the core values of interconnectedness, participation and trust. The second value cluster is relevant for the organizational and individual 'doing', for actions planned or undertaken, and comprises justice and responsibility. The third value cluster is relevant for 'becoming' and is characterized by the alignment of personal and organizational development; it comprises the values of growth and resilience.

## 5 Safety values and safety culture

Schein (1997, 2007) distinguished three levels of organizational culture: basic assumptions, espoused values, and artifacts. The basic assumptions cannot be directly observed or perceived, but they are the core of an organizational culture. The espoused values are those that the organization and its top management proclaim to be important. The artifacts, e.g. working practices, are phenomena co-determined by the corporate culture; they can easily

be observed or measured, but it is not so easy to clarify the link with the two underlying layers of the culture. The influence of the deeper layers of culture, the basic assumptions and values, on the members of the organization remains largely unconscious or even subconscious [Hofstede et al 2010, Schein 1997, Schein 2007]. It is transferred to new members of the organization through implicit socialization processes. In his research Schein clearly demonstrated that for a long-lasting safety improvement, a change in the organizational culture can be needed, implying that this change cannot be limited to a change in artifacts or espoused theories, but also requires a change of the 'basic assumptions,' which we assume to include internalized values (Giddens 1991).

Safety culture concern meanings, interpretations, attitudes, values, beliefs, rules and procedures related to safety (Díaz-Cabrera et al., 2007). Safety climate is defined as “these shared perceptions about safety values, norms, beliefs, practices, and principles of workers in their environments” (Gyekye & Salminen, 2009, 2010).

Safety values are closely connected with organizational culture. Organizational culture is defined as shared values and beliefs that interact with company's people, organizational structures and control system to produce behavioral norms (Edwards et al., 2013). On the other hand, Guldenmund (2000) includes beliefs and values about work, people, the organization and the community that are shared by most members within the organization as a part organizational culture.

Safety climate describes individual perceptions of the value of safety in the work environment (Neal, Griffin & Hart 2000). Organizational safety climate is a specific form of organizational climate, which denotes the shared perception of safety values, norms, beliefs, practices, and principles that workers have of their work environments (Gyekye et al., 2012). An anthropological view sees safety culture as a series of underlying beliefs, attitudes, values and assumptions shared by members of an organization (Edwards et al., 2013).

The definitions of safety culture and safety climate often share the same words illustrating the weak boundary between organizational climate and safety culture.

In addition, Diaz-Cabrera and her co-workers (2007) found in the factor analysis of organizational safety climate a factor including the following values: values ruling fulfillment, values in sincerity and participation, values of goal achievement, values in collaboration in goals achievement, values participating in safety promotion, values ruling observation, values contributing creative ideas, and values initiating in finding new solutions.

## 6 Mechanism that form and strengthen organizational safety values

Values can be conveyed through organizational socialization, when leaders set the values of the organization and propagate them to employees. This requires that values serve some kind of function for the individual or they must be presented as the only possible interpretation of the situation. (Ravlin 1998)

Some mechanisms have been found that strengthen safety values. For example, supervisor safety practices are associated with a stronger safety values (Newman et al., 2012). Griffin and Neal used a four item scale about the degree to which managers were perceived to value safety in the workplace. An example item was "Management values safety" (Griffin & Neal, 2000). Drivers were motivated to drive safely if they perceived both their supervisors and fleet manager value safety.

Management tend to be associated with global policies and safety culture, and so influence safety at an industry level. On the other hand, supervisors and workmates influence safety climate and group values and thus showed a greater influence on local safety performance. At the shop-floor level the guidelines and values are modified or reinterpreted. Level of trust in workmates was the strongest predictor of near-miss involvement (Conchie & Donald, 2006). Trust/mistrust attitudes towards management were identified as the strongest influence on safety performance (Conchie & Donald, 2006). Trust is a necessary condition for spread of safety values (compare with Reason 1997). Well-aligned words and actions send clear signals to employees that appropriate safety behavior will be rewarded and inappropriate safety behavior will be sanctioned

Trade unions make workplace safety a high priority in contract bargaining. Safety motivation was related to the union and supervisor safety values, but safety knowledge was not related to safety values (Sinclair et al., 2010). When sea farers were high on hardiness, personal values had no effect on safety behavior. On the other hand, when hardiness was low, conservation values (security) seemed to increase safety behavior (Hystad & Bye, 2013).

Safety value chain identifies those who contribute to accident prevention and sustain of system safety. It also highlights the agency influencing and contributing to accident prevention and sustainment of system safety. Safety value chain includes operators, technicians, engineers, system designers, managers and executives, shareholders, regulators, safety inspectors, and accident investigators (Saleh & Pendley, 2012). Gregory et al. (2009) listed managers' support, empowerment, mentoring and supporting team work ways to improve safety values.

## 7 Impact of safety values on daily routines

Safety and environmental matters are the first on the agenda, said an English CEO (Karr, 1999). When managers espouse safety values in their speeches, employees may perceive the leader's concern for safety as more genuine, and therefore they would be more likely to speak about safety issues (Halbesleben et al., 2013). Responsibility of Australian fleet managers in safety management could be acknowledged more formally, in order to strengthen the fleet manager's role to ensure the organizational approach to fleet safety. They also provide feedback to drivers on their safety performance in a work vehicle (Newman et al., 2008). A supervisor who values safety is more likely to be committed to prioritizing safety within their work role tasks, and this tendency is consistent with their safety actions (Newman et al., 2012). However, 88% of British senior directors indicated that employee morale and reputation would be adversely affected by a poor health and safety culture (Smallman & John, 2001).

Colley and Neal (2012) found some unexpected results. Firstly, corporate values were more central to supervisors' schema than to senior managers' schema. Corporate values play an important role for supervisors in the way that they approach and deal with safety. Secondly, issues relating to the work environment, e.g. trade-off between safety and productivity are more central for senior managers than for supervisors.

When workers perceive their organization to be supportive, they also perceive management as valuing their safety (Salminen et al., 2013). Older workers had the best perceptions of safety, managements' concern for workers' safety, and efficacy of safety programs in place at worksite (Gyekye & Salminen, 2009). Workers who perceived organizational support relatively high, considered their companies safety programs worthwhile, good, useful, first-rate, and important more often than other workers (Gyekye & Salminen, 2007).

Values influence employee perception of safety (Colley et al., 2013). Blue collar workers valued secure surroundings more than top managers in a large Finnish metal factory (Salminen & Koivula, 2006). Trade unions' safety values influence safety outcomes through its association with higher safety motivation, showing a similar effect as that of supervisors' safety values (Sinclair et al., 2010). American contractors should emphasize organizational safety values to new workers during selection process (Lai et al., 2011). Sea farers with a stronger emphasis on conservation values reported a higher level of safe behaviors (Hystad & Bye, 2013).

Safety values are also important among American college students. They predicted safety practices among students. Female students were found to be more conscious about safety values than male students (Crowe, 1995). In an American hospital, group culture and balanced cultures (with values necessary to operate in all four quadrants) achieve higher level of patient satisfaction (Gregory et al., 2009).

Safety values are also included in questionnaires used at workplaces. For example, a social capital questionnaire includes items like feelings of safety and value of life and social agency



(Kritostakis et al., 2011). A balanced cultural profile would be associated with better safety (Colley et al., 2013).

In conclusion, we can say that status in the company contributed on the valuing safety. Top managers said that safety is in the top of agenda, and often it is held among first issues in the meetings. Employees look at safety values in different way as more practical way concerning their personal safety.

## 8 Barriers for implementing safety-related values

Values set for the organization may lose their priority if organization rewards value violation, or when individuals are forced to choose between conflicting values. (Ravlin 1998). Few studies has been done concerning barriers for implementing safety-related values. For example, managers in health care may be forced to espouse high safety values, without being able to follow-up on these expectations themselves. In addition, looking at only one indicator (e.g., frequency of injuries) may not represent the whole picture of safety (Halbesleben et al., 2013). In an Australian transportation fleet, it is uncertain whether senior-level managers had given supervisors the directives, how to manage their fleet safely (Newman et al., 2008).

Colley and Neal (2012) presented that bottlenecks in transferring and reinforcing the safety message may occur because of the communication styles and differing values of supervisors. Managers are more likely to emphasize components of safety which are prominent in their personal safety schema (i.e. corporate values and organizational safety priorities), and give less attention to topics that are central to the safety schema of employees (e.g. practices, procedures, and training). Employees often do not share unified beliefs about the value of safety with managers.

Line managers have to manage the dual goals of productivity/efficiency and safety. If a productivity schema is more salient and important in the thinking of individual managers, they may over-emphasize productivity and under-emphasize safety. Information that is communicated to employees that is inconsistent with their existing schema may not be recalled as easily and may be given less attention and even be ignored. When these reasons are combined, it becomes important to develop and implement strategies to minimize miscommunication arising from misaligned safety schema (Colley & Neal, 2012).

Prevention of occupational injuries should be focused concerns with safety and responsibility (Higgins, 2002). The threat of work stoppages or grievances should increase management awareness about safety concerns and increase the likelihood that existing policies are followed (Sinclair et al., 2010).

These studies showed that barriers related to safety values are often connected to the wider culture in corporations.

## 9 Conclusions

Some conclusion can be drawn from the review of literature:

1. There is not yet a clear and broadly accepted definition of the value of safety or safety values.
2. Safety is a value in itself, associated with a basic human right.
3. The value of safety is often implicitly associated with the importance associated with safety in the organization.
4. 'Safety as a value' goes beyond 'safety as a priority'. Organizational values have a more strategic impact than priorities. They can also be expected to have implications for a longer period, as priorities may easily change, while shared values are much more stable over time.
5. There are several safety related values that are important for developing or supporting safety practices and/or safety culture. The most well-known are justice (Dekker 2012, Reason 1997), trust and informedness (Reason 1997). Trust between managers and employees, as well as a just culture seem to be necessary preconditions for spread of safety values.
6. Safety values are closely related to organizational culture. But safety culture is a broader concept (also with many definitions), which includes in addition to values norms, beliefs, practices and principles which can be related to safety.
7. Top managers and supervisors can strengthen safety values by consistent actions.
8. It is important to distinguish between values that are really shared and lived-up to, and espoused values, which are mainly communicated verbally and in writing. When there is a difference between the two, employees will not believe the espoused values.
9. Employees look at safety values in more practical way than managers and often do not share same safety values as managers.

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