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Learning to improve safety: the role of communities of practice and collective mindfulness

By David Borys FSIA, VIOSH
Australia, University of Ballarat

The phrase, “learning to improve safety” is introduced here as a deliberate double entendre for the purpose of providing a point for reflection and discourse. The phrase causes one to simultaneously reflect on the questions: what occupational health and safety (OHS) interventions make a difference and under what circumstances and, does learning, and in what form, improve safety?

A cautious answer to the first question might be that what is done to improve OHS outstrips what is known about the effectiveness of what is done. OHS does not thirst for ideas, rather evaluation of the ideas in practice. Likewise, having a sense of the theoretical underpinning for why what is done to improve safety is being done approaches the status of an oxymoron. Within the gamut of things done to improve OHS, learning, or perhaps more explicitly training, is almost taken as a given. In thinking about the second question then, it would be easy to take a leap of faith that training leads to learning and learning improves safety. This may be true some of the time but maybe not all the time. Of course, one would also need to define what “improving safety” means, and here again debate is probably rife – but it is hoped that there would be agreement that ultimately improving safety means a reduction in fatalities, injuries and disease (FID).

This paper will tackle some of the issues raised above, and in doing so, is broken into three sections. In the first section collective mindfulness,

together with the related concept of safety culture, will be explored as an idea for improving safety. In the second section some preliminary results and reflections from an intervention in the meat industry aimed at building organisational capacity for collective mindfulness will be presented and discussed. The third section will build upon the reflections from the meat industry intervention and explore organisational learning and, in particular, communities of practice.

Collective mindfulness

Collective mindfulness was first introduced into the language of OHS in the late 1990’s by Weick et al. (1999) who at that time brought together research conducted into so-called High Reliability Organisations (HRO). HRO are organisations whose activities are interactively complex and tightly coupled such as aircraft carriers and air traffic control centres – but who have less than their fair share of failure. This line of research emerged in response to Perrow’s (1984) analysis of the incident at Three Mile Island

in 1978 in which Perrow coined the term Normal Accident Theory (NAT) (Perrow, 1982). That is, accidents are inevitable in an interactively complex and tightly coupled system such as nuclear power generation. Perrow argued that such systems are incomprehensible to operators, and hence accidents will be a normal outcome of these systems. On this basis Perrow argued for the abolition of high risk technologies such as nuclear power. However, and as a counterpoint to Perrow’s view, the HRO studies, unique in that the research drew lessons from success rather than failure, highlighted that such systems could in fact operate reliably (La Porte, 1982; La Porte & Consolini, 1991; LaPorte & Consolini, 1991; Roberts, 1990a, 1990b; Roberts & Rousseau, 1989). The competing views have been subject to rigorous debate in the academic literature (Hopkins, 1999; La Porte, 1994; La Porte & Rochlin, 1994; Perrow, 1994; Pidgeon, 1997; Rijpma, 1997, 2003; Sagan, 1993) but it was Weick (1999) and his colleagues who drew the literature on HRO together in its current popular form around the concept of collective mindfulness. In so doing, they have drawn on and built upon work by Langer (1989b) into individual mindfulness. Langer defines mindfulness as “... a flexible state of mind in which we are actively engaged in the present, noticing new things and are sensitive to context” (Langer, 2000, p. 220).

Langer (1989a) suggests that mindfulness may be better understood by considering its opposite – mindlessness. According to Langer, mindlessness is characterized by entrapment to category, automatic behaviour and acting from a single perspective (Langer, 1989a).

In applying Langer's ideas to organisations, Weick and Sutcliffe (2001) define collective mindfulness as:

“... the combination of ongoing scrutiny of existing expectations, continuous refinement and differentiation of expectations based on newer experiences, willingness and capability to invent new expectations that make sense of unprecedented events, a more nuanced appreciation of context and ways to deal with it, and identification of new dimensions of context that improve foresight and current functioning”. (p. 42)

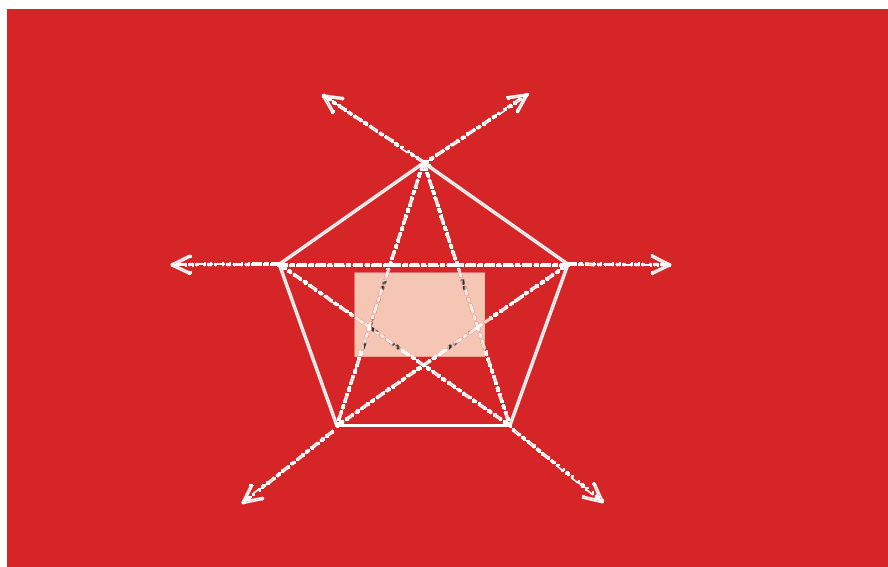
Therefore mindfulness, in its organisational sense, means to “preserve the capability to see the significant meaning of weak signals and to give strong responses to weak signals” (Weick & Sutcliffe, 2001, p. 4).

Collective mindfulness is characterized by: *a preoccupation with failure* that treats any lapse as an indicator that something is wrong with the system; *a reluctance to simplify interpretations* by creating more complete pictures and trying to see more; by having *sensitivity to operations* or an ongoing concern for the unexpected through situational awareness that allows errors to be identified and contained; by *commitment to resilience* or being able to bounce back once things start to go wrong which requires improvisation in the moment and knowledge of the system and a *deference to expertise* by moving decision making down and around the organisation based again upon the need in the moment (Weick & Sutcliffe, 2001).

Although the five processes of collective mindfulness draw upon and extend Langer's construct of mindfulness, the key difference is in the move from mindfulness as an individual construct to collective mindfulness being an organisational construct (Hopkins, 2002).

Finally, Weick and his colleagues argue that the five processes of collective mindfulness are applicable

Figure 1 Shared Prevention Framework, Adapted from Borys, (2001)



to a wide variety of organisations (Weick & Sutcliffe, 2001; Weick et al., 1999).

Two points emerge from this brief overview of collective mindfulness. The first is that the original studies were all post-hoc studies of organisations operating reliably. That is, the organisations were already designed to operate the way they were and the researchers' role was in attempting to understand what characteristics made these organisations reliable. In other words, little is known about the utility of the construct as a prevention tool. A key question is – is it possible to proactively develop an organisations capacity for collective mindfulness and how would you go about doing so? Secondly, little is known about the broader applicability of the five processes of collective mindfulness to organisations that are not interactively complex and tightly coupled, in other words, non-HRO. So a second key question would be – can the processes of collective mindfulness, and perhaps which ones, be applied to non-HRO and with what success?

To complicate matters further, the concept of collective mindfulness overlaps significantly with that of safety culture. Both Reason (1997; 1998; 2000) and Hudson's (2003) work on safety culture draws on the work of the HRO studies in support of the development of their own ideas and models of safety culture. In particular, Reason talks about an informed culture made up of four sub-cultures – a reporting culture, a just culture, a flexible culture and a learning

culture (Reason, 1997). Aspects of these sub-cultures of an informed culture can be mapped across to the processes of collective mindfulness. For example, the mindful process of pre-occupation with failure links closely with the reporting and just sub-cultures of an informed culture. One way to reconcile these issues could be to think about Reason's sub-cultures as organisational systems that operate in support of the processes of collective mindfulness as practiced by workers and managers. Weick and Sutcliffe see the relationship as fundamental and posit that a safe culture is likely to be a mindful culture. Therefore mindfulness can be treated as a culture as well as a set of processes, and that a “mindful culture resembles an informed safety culture” (Weick & Sutcliffe, 2001, p. 147). Going the other way, an informed safety culture incorporates the process of collective mindfulness (Reason, 1997). In summary, an “informed safety culture is designed to augment mindfulness” (Weick & Sutcliffe, 2001, p. 120).

FEATURE

As academically interesting as all this may be, the question remains: how do non-HRO build capacity around the ideas of a culture of safety that is mindful and informed, and will it make a difference? The next section presents the findings of an intervention in the meat industry that attempted to do just that.

Meat industry intervention case study

The intervention was undertaken as part of a joint initiative between the regulator, the industry association and unions to facilitate sustainable OHS improvements in the meat industry. The organisation involved originally wanted to implement a behaviour-based safety program to bring about cultural change, but this approach was revised and an intervention based around the principles of collective mindfulness and an informed culture was agreed to, and was successful in securing funding.

The intervention

The vehicle for carrying the concepts of collective mindfulness and an informed culture into the organisation was a shared prevention framework (see Figure 1). The framework, which is built upon systems understandings (Borys, 2001) shows the system interactions necessary for prevention, and was deemed appropriate in this context as it enables all people in an organisation to see the big picture in relation to preventing FID – a precondition for being reluctant to simplify interpretations.

The intervention targeted all people in the organisation – managers and workers alike. A key focus of the intervention was to develop a reporting culture, one in which workers felt safe to report errors, mistakes, incidents or anything in fact that they felt was not right, and to have the information acted upon. This approach required both workers and managers to develop a capacity for mindfulness in an industry where, because of the repetitive nature of the work, mindlessness could easily become the norm. Workers were encouraged to practice mindfulness through a version of the shared prevention framework that prompted workers to Stop, Think and Assess Risk (STAR). The purpose of STAR was to prompt workers to be more sensitive to operations through enhancing their capacity for situational awareness.

Table 1 Thinking about Safety Questionnaire – Mean Responses by Group Before and After the Intervention

| Question | Workers Before | Managers Before | After |
|--|----------------|-----------------|-------|
| 1. People in this organization have trouble getting all the information they need to do their work. | 3.16 | 2.44 | 3.00 |
| 2. People are expected to perform their jobs in particular way without deviations. | 3.57 | 3.12 | 3.12 |
| 3. People often work under severe production pressures (that is, time, costs, growth, or profits) | 3.98 | 3.96 | 3.85 |
| 4. Pressures often lead people to cut corners. | 3.98 | 3.33 | 3.48 |
| 5. There are incentives in the work environment to hide mistakes. | 2.93 | 2.21 | 2.50 |
| 6. People have little discretion to take actions to resolve unexpected problems as they arise. | 3.13 | 2.75 | 2.58 |
| 7. Many people lack the skills and expertise they need to act on the unexpected problems that arise. | 3.75 | 3.04 | 3.35 |
| 8. People rarely speak up to test assumptions about issues under discussion. | 3.59 | 3.13 | 3.32 |
| 9. If you make a mistake, it is often held against you. | 3.13 | 2.28 | 2.62 |
| 10. The work practices in my workplace are not the same as the written (safe) work procedures. | 3.07 | 2.74 | 2.85 |
| 11. Around here people are not blamed if there is a near miss or a work related injury or illness. | 3.12 | 3.48 | 3.40 |
| 12. People are willing to report errors and, near misses. | 3.24 | 3.08 | 3.16 |

Workers were encouraged to notice new things, change what they could change, and to report what they couldn't to management.

The methodology

Knowledge about the shared prevention framework and STAR was delivered to all people in the organisation via an external trainer. The training was conducted in a training room on-site but remote from the main plant. Managers received a two hour session which focused on the management systems required to support an informed culture as well as the processes necessary for building capacity for collective mindfulness. Workers participated in a one hour session in which they were introduced to the shared prevention framework, the principles of collective mindfulness, hazard identification, risk assessment

and control and STAR. A number of small case studies were developed to support the learning.

A process of evaluation was designed to gather data before and after the intervention and was restricted to a six month time period. It was hoped to show that the culture of the organisation was more mindful and informed after the intervention and that this culture correlated with a reduction in FID. Three types of data were gathered: organisational performance data including number of injuries, a questionnaire to gauge perceptions of mindfulness (before the intervention this data was collected in the training room prior to the training) and a series of focus group questions designed to probe the practical implementation of the intervention. As the intervention was being conducted

by a group of consultants/researchers from a University, ethics approval was sought and given by the University ethics committee.

Results

One hundred and sixty-five workers and 26 managers participated in the program. Response rates to the before intervention questionnaire were high (approximately 95%) but low after the intervention (approximately 12%). The questionnaire results are shown at Table 1. Respondents rated each question on a five point scale from strongly disagree to strongly agree.

In relation to the questionnaire, the fact that the worker data could not be discriminated from manager data post-intervention makes any comparisons invalid. There are, however, observable similarities and differences between workers and managers perceptions of safety prior to the intervention occurring. For example, workers and managers seem to disagree on the availability of information (question one) yet both tend to agree that people are willing to report errors. Further, if general observations were to be made pre and post intervention, then questions two and six both show a reduced mean after the intervention that is equal to or less than the mean of either group before the intervention. Although nothing can be inferred from this observation, it could be indicative of a change of perception in favour of mindfulness. That is, the intervention might have prompted people to think differently about the fact that there may be more than one way to perform a task and that perhaps people could have the discretion to resolve unexpected problems as they arise.

Furthermore, an analysis of the before intervention data, coupled with responses from the focus group, did allow for some insights to be drawn. For example, both workers and managers agreed that people are willing to report errors and near misses and that in so doing it won't be held against you. However, a view presented at the focus group was that it was "not in the culture to complain". So perhaps people are willing to report but the culture, for whatever reason, prevents them from doing so. Given that a key component of a mindful and informed culture is reporting and learning from errors

and incidents, then this result would indicate that at this juncture more work is required to build a reporting culture.

Overall the focus group did indicate general support for STAR and the ideas that had been taught, although it was not clear how well the ideas were being practiced or would be sustained. Some practical improvements had been made to plant safety, but it was not possible to ascertain whether they were as a consequence of the intervention.

Another interesting result was in relation to the question "what are the main causes of work related injuries and illnesses". Before the intervention, managers viewed the main cause as "worker being careless", whereas the workers viewed pressure and stress and the boring nature of the work as equally important main causes. After the intervention, however, the main cause was viewed as workers being careless – although it was not possible to separate workers and managers responses at this point.

The best designed intervention based upon sound theory and with a rigorous evaluation strategy may still fail if how organisations learn is not taken into account



The point is, however, that there is still a strong focus on the worker rather than the work and the workplace. This is akin to what Langer refers to as "acting from a single perspective" – or mindlessness and would seem to be a strong inhibitor of developing a culture that is collectively mindful and informed.

No change in injury rates was reported but this is to be expected given the short duration over which the intervention was evaluated (6 months).

Discussion

This intervention raises a number of important issues. It highlights the practical difficulties of trying to undertake rigorous intervention evaluations in workplaces. It also highlights the difficulty of underpinning interventions with a theory in mind and packaging it in such a way that it is digestible and sustainable by an organisation. In other words, the best designed intervention, based upon sound theory and with a rigorous evaluation strategy, may still fail if how organisations learn is not taken into account.

This intervention was largely introduced from the top down and with the support of external funding. The ideas were transferred into the workplace through a "shot in the arm" model of teaching. That is, ideas were injected into people and out of context of their normal work activities via an external trainer. The key reflection is that it is not only *what* you do to improve safety that is important, but *how* you do it.

Communities of Practice

The answer to the question, "how do organisations learn" is alive with ideas and models; however, for our purposes here, two points will act as guiding principles. The first point is that it is about learning not teaching, and secondly, that learning is as much, if not more a social process of forming a new identity as it is a cognitive process of transferring knowledge from the head of one person to the head of another. The intervention discussed in the previous section fell short on both accounts. It was about teaching and it was about teaching out of context – trying simply to inject cognitive knowledge into the heads of workers, divorced from social practice on the job.

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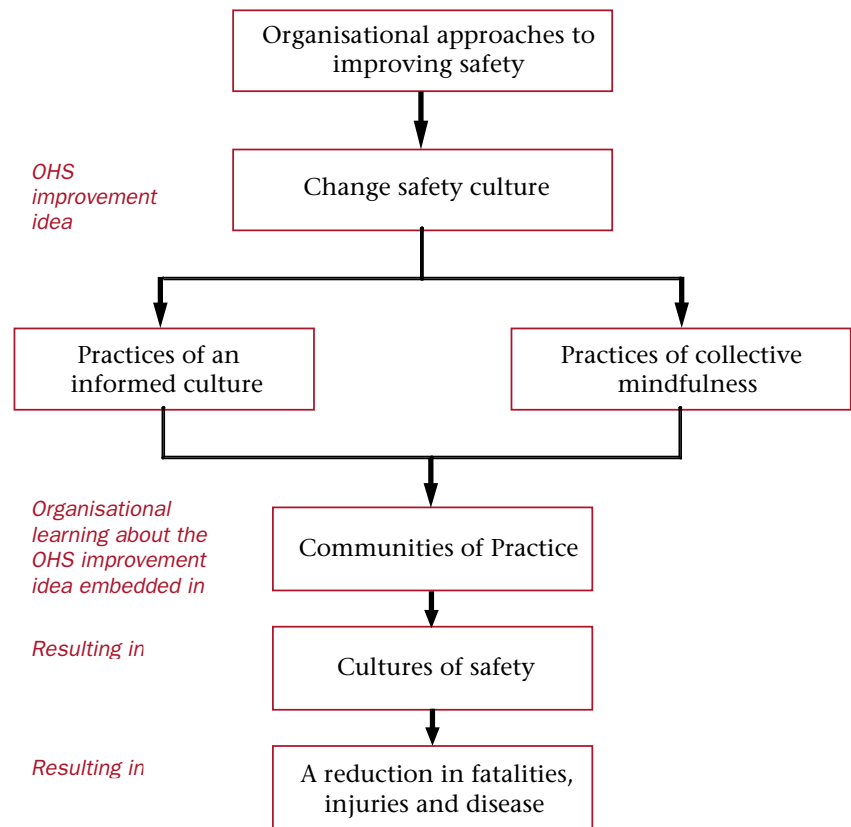
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A social practice theory view of learning characterises learning as a process of legitimate peripheral participation in a community of practice (COP). Taking this view of learning, social practice, rather than cognitive processes, is the primary consideration and learning is only one characteristic of social practice in the “lived-in-world” (Lave & Wenger, 1991, p. 35). According to Lave and Wenger (1991) “there is a significant contrast between a theory of learning in which practice (in a narrow, replicative sense) is subsumed within processes of learning and one in which learning is taken to be an integral aspect of practice (on a historical, generative sense)”. (p. 34)

This view of learning stands in stark contrast to approaches to learning that rely upon training to transmit OHS ideas to workers. The COP view broadens our understanding of the social context in which learning takes place and forces us to think differently about how ideas to improve safety become embedded in the workplace. This view, in relation to OHS, is supported by Gherardi and Nicolini (2000) who assert that communities of practices “play an active part in the construction of safety” (p. 16) and that “producing safety means bringing about significant and enduring changes in the culture and practices of a community”. (p. 16)

This discussion on COP as an alternative means for analysing and understanding organisational learning provides a useful framework for restructuring thinking about how OHS ideas can be embedded within workplaces (see Figure 2). Collective mindfulness and an informed culture have a lot in common with COP, and hence COP could be a legitimate site for stimulating learning about the practices of a mindful and informed culture. This focus on practice is also consistent with Reason’s (1997) view that safety culture can be changed (engineered) by changing practices rather than by attempting to change values and beliefs. Reason draws upon the work of Geert Hofstede in forming his view. Hofstede researched both national and organisational cultures and found that at the national level values, learnt early in life, distinguished different cultures whereas at the organisational

Figure 2 A Framework for Learning to Improve Safety



level practices, learnt in the workplace, distinguished different cultures and that practices were open to influence by organisational structures and systems (Hofstede, 1991). One needs to be careful not to be seduced by the notion of changing practices however, and to resist viewing practices in the narrow sense and understanding practices in the broader sense of social practice. Finally, learning to be mindful increases learning anxiety (Weick & Sutcliffe, 2001) and COP may also provide the

environment for what Edgar Schein refers to as “psychological safety” (Coutu, 2002) that will allow new learning to occur.

This exploration of an alternative understanding of organisational learning raises the question – are communities of practice an effective level at which to intervene in an organisation to grow a culture of safety that is mindful and informed and which, in turn, leads to improvements in safety?



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Conclusion

Learning to improve safety at first glance may appear a deceptively simple task. A more thoughtful analysis reveals that this is not so. Collective mindfulness and an informed culture may have a role to play in improving OHS in ordinary, everyday

organisations, but we are a long way from having any evidence to show how these ideas can be implemented in workplaces and if they make a difference. An intervention in the meat industry designed to build capacity in these areas resulted in conflicting and unclear results. Reflection on the

intervention suggests, however, that it is not only what you do to improve safety that matters, but how you do it. Therefore, the role of communities of practice warrants further exploration in relation to learning to improve safety.

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