



### Speaking notes for Safety Culture Assessment: What are we trying to Achieve?

Presentation delivered by:

Joelle Mitchell at the Safety Psychology Conference, Sydney, October 2012

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[slide 4]

Within the published research, safety culture tends to be understood as a component of organisational culture, and so theory and models of organisational culture are generally applied to the concept of safety culture. Schein's (1985) publications on organisational culture are often referenced in the safety culture literature.

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Schein describes culture as being like an onion – there are multiple layers. This is a common way of describing culture and is used by a number of culture researchers, with variation in the numbers of layers discussed. Schein refers to three layers of culture.

The outer layer is labelled **Artefacts**. These are the physical things within an organisation, such as the condition of tools and equipment, what people are wearing, posters on the walls, the layout of the work area, etc. Artefacts are easy to observe but difficult to interpret. For example, we might observe that a site has a large number of supervisors, each with a relatively small crew reporting to them. This may represent an organisational belief that in-field coaching and continuous feedback is the best way to develop a competent and capable workforce. It may also represent a belief that all workers are lazy and they must be constantly supervised if they are to be productive.

The middle layer of the culture 'onion' is labelled **Espoused Values**. This is what we say we do, as an organisation, and as members of the organisation. Espoused values include the contents of policies and procedures, and the things spoken about within the organisation. Espoused values can often be incongruent with what actually happens at work. For example, an espoused value that is common to many organisations is "the right to stop the job". This is something that the workforce is told regularly, and when asked, will generally agree that they do indeed have the right to stop the job. However there are many occasions where an emergency situation has emerged and no-one has actually stopped the job. Senior leaders later ask why this was the case, when workers have been repeatedly told that they can stop the job.

The reason for this incongruence lies in the central layer of the onion.

**Basic Assumptions** represent the core beliefs of an organisation which drive the behaviour of members of the workforce. These are often unspoken and difficult for members of the organisation to recognise or articulate. Basic assumptions represent the central focus of culture analysis, as they explain why observed organisational phenomena occur. An understanding of an organisation's basic assumptions will help to explain why those workers didn't stop the job in that emergency situation, or why a site has such a large number of supervisors in the field. An understanding of relevant basic assumptions when developing solutions to problems or improvement strategies can increase the likelihood of success.

[slide 6]

A group of scientists put five monkeys in a cage. In the centre of the cage was a stepladder, and a banana was hung from the very top. The monkeys scurried up the ladder to retrieve the banana, and then the scientists sprayed them with freezing cold water to prevent them from reaching the banana. Each time they tried to go up the ladder, they were again sprayed until no monkey went up the ladder.

The scientists removed one monkey from the cage and replaced it with a new monkey. The new monkey saw the banana, saw the ladder and attempted to go up. The four original monkeys, afraid of being sprayed

with water, assaulted the new guy to prevent him from going up the ladder. He had no idea why he was being assaulted, but he didn't go up the ladder again.

A second original monkey was removed from the cage and replaced with a new one. Same thing: The new monkey attempts to go up the ladder to retrieve the banana and, once again, the newest monkey is assaulted. Except this time, the first new monkey takes part in the beating of the newest monkey. He has no idea why he is participating in the beating, but nevertheless, it happened to him. This continues until there are no original monkeys in the cage that were sprayed with cold water. But no monkey dares go up the ladder out of fear of being assaulted, not of being sprayed with cold water.

This story highlights the basic process by which a culture (i.e. a set of shared basic assumptions) is developed.

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A large proportion of the published safety culture research uses perception surveys as a means of measuring safety culture. These studies either aim to develop and validate perception surveys and identify a normative set of factors, or use existing surveys to explore other organisational phenomena. This approach has resulted in the development of a very large number of questionnaires, and the identification of a broad variety of factors, with factor structures difficult to replicate between studies. A few factors, such as leadership commitment and communication, are generally found in most studies.

[slide 11-12]

This normative approach has been criticised by a number of researchers for losing the value of the culture concept in favour of an easy but ineffective measurement tool.

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Given the overwhelming representation of perception survey research within the safety culture field, the next slides will explore these in more detail.

[slide 14]

There are many reasons why perception surveys are attractive to organisations and to researchers. Primarily, people tend to be more comfortable with quantitative data. It is easier to analyse, interpret and report, and generally requires less investment of time and money than qualitative methods. All of these reasons are valid, but only if what is being measured and reported provides useful and reliable information.

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There are a number of reasons why perception survey data should be interpreted with caution. Perceptions are subjective and reflect a wide range of influencers. Of particular importance is the work history and experiences of individuals, as this can influence how they evaluate their current environment. Perceptions are also volatile and can fluctuate in response to a range of irrelevant factors. Perceptions may not always be provided honestly, and they are subject to the influence of various cognitive biases, including selective memory, where individuals may genuinely forget cases where they have broken the rules, taken shortcuts, not reported a near miss, etc.

Aside from the reliability of self-reported perceptions, the validity of the surveys themselves is also questionable. Construct validity refers to whether the tool is measuring what it claims to measure, in this case safety culture. Mono-method bias is a threat to construct validity, and poses a risk when only one instrument or approach is used to measure a construct. Predictive validity refers to whether the results generated by the tool predict something useful. These validity issues will be further explored in the following slides.

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The reason organisations use perception surveys is because they recognise the importance of culture on safety performance, and they believe that perception surveys measure culture, and thus provide a leading indicator of safety performance.

[slide 18]

Given what we know about how a culture is developed – through a shared history of problem-solving successes, it is unlikely that all organisations will hold the same basic assumptions about how to solve certain problems. Additionally, where basic assumptions may be similar, the ways in which they influence organisational outcomes are likely to vary. The use of a pre-determined set of cultural factors, therefore, is a questionable approach to use when trying to understand the basic assumptions of an organisation.

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Beyond issues of normative factors, it should also be noted that perception surveys only access the espoused values layer of the culture 'onion'. Perception surveys provide information on what we say we do, but not what we actually do, or why we do it that way. Here we can see the issue of mono-method bias at play – using one instrument or approach does not accurately describe the culture.

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This would not be as much of a concern if perception surveys actually provided organisations with the information they were seeking about the influence of their culture on their safety outcomes. But surveys rarely detect this information, for the reasons discussed above regarding the limitations of perceptions.

[slide 21]

So the first part of the assumption underpinning the use of perception surveys is false – they do not reliably measure safety culture. However, the second part of the assumption may still hold true, so we will now explore whether perception surveys act as a leading indicator of safety performance.

[slide 22]

One of the cornerstones of psychology is evidence-based practice. This means that psychologists look to the research to inform ethical practice – that is, whether a particular approach is likely to achieve the desired outcomes, given relevant contextual factors. Safety culture research using perception survey data has reported weak to moderate correlations between perception survey scores and injury frequency rates. Beyond the known limitations of the use of frequency rates, the key point here is that only correlational information has been obtained.

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This correlational data tends to be interpreted as suggesting that safety perceptions influence safety behaviours, which lead to injury rates. However, as a correlation does not prove a causal relationship, there are a number of other interpretations which are equally as possible.

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It is possible that safety behaviour leads to injury rates, which influence safety perceptions.

[slide 25]

It is also possible that there is an interaction between behaviours, perceptions, and injuries.

[slide 26]

It is also possible that some unknown variable is exerting an influence on both perceptions and injury rates, or even that the correlation is entirely meaningless and that there is no relationship between the two variables (for example, if we saw a correlation between the percentage of employees with blue eyes and the injury rate – this is clearly a meaningless correlation).

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Assumptions about the nature of the relationship between perception survey scores and safety outcomes should not be made based on correlation data. Additionally, the relevance of frequency rate data should also be questioned as a means of demonstrating that the survey is valid. There are many instances where sites have had very low injury frequency rates and yet experienced disastrous incidents.

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A correlation between perception survey scores and injury frequency rates does not indicate that the survey will be able to identify those factors that lead to major disasters.

[slide 29]

Indeed, a case study has demonstrated a situation where a perception survey not only failed to predict a significant incident, but actually delivered findings that contradicted those of the incident investigation.

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A brief look at these contradictory findings provides a clear example of the problems associated with perceptions, and the limitations of perception survey data.

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The critical question for organisations to ask themselves is whether perception surveys are the best way to spend limited safety resources. There is no evidence to suggest that such surveys predict major events, and while they show some correlation with occupational injuries, there are other lead indicators that also do this, and do so with greater accuracy and efficiency.

[slide 32]

Ultimately, perception surveys are used because organisations believe they will learn something about their safety culture, which is recognised as an important factor in incident investigations. Culture is certainly a useful concept to apply within a safety context, if it is used effectively.

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Rather than trying to measure culture, it is better used as a method of organisational analysis, to uncover the meaning of observed things. By uncovering the basic assumptions that explain why certain phenomena occur, organisations can develop improvement strategies that are more likely to work within those basic assumptions, or ways to deconstruct and rebuild them.

[slide 34]

Triangulation is absolutely important when seeking to explore a culture – a greater variety of methods will result in greater depth of understanding. Qualitative methods should be used to gather information about meaning. Qualitative methodology, as with any research method, is a discipline in which researchers acquire skill over time. Organisations implementing qualitative methods should ensure that they are applied by appropriately qualified and experienced people.

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There is a proliferation of quantitative data already recorded by organisations that can be used to benchmark and track changes in performance. These can be used to assess the success or otherwise of safety improvement initiatives, including culture change processes. Additionally, qualitative data can be used to track change over time.

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Perception surveys can add value within a culture assessment, but they must be used appropriately. Organisations should critically evaluate the survey development and validation process; consider the industry and company within which the tool has been applied; and also how the tool has been linked to

safety outcomes. Survey findings should be used to drive further qualitative inquiry; they should not be interpreted in isolation from qualitative data.

**Thank You**