



The influence of dispositional mindfulness on safety behaviors: A dual process perspective



Jingyu Zhang^a, Changxu Wu^{a,b,*}

^a Chinese Academy of Sciences, China

^b State University of New York

ARTICLE INFO

Article history:

Received 14 August 2013

Received in revised form

15 November 2013

Accepted 12 March 2014

Keywords:

Dispositional mindfulness

Safety behaviors

Intelligence

Work experience

Conscientiousness

Dual process

ABSTRACT

Based on the dual process model of human cognition, this study investigated the influence of dispositional mindfulness on operators' safety behaviors and its boundary conditions. In a sample of 212 nuclear power plant control room operators, it was found that both safety compliance and safety participation behaviors were positively influenced by dispositional mindfulness as measured by the 14-item Freiburg Mindfulness Inventory. This effect was still positive after controlling for age, intelligence, work experience and conscientiousness. Moreover, two boundary conditions were identified: the impact of dispositional mindfulness of safety behaviors was stronger among operators who were either more experienced or more intelligent. Theoretically, the framework we used to understand the benefit of mindfulness on safety behaviors has been proved to be useful. Practically, it provides a new and valid criterion that could be used in operators' selection and training program to improve organizational safety.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

Safety at the workplace is an enduring and pivotal issue for high risk industries such as nuclear power plants. While technical failures have been reduced dramatically in the last three decades, unsafe human behaviors have become one of the most important sources of injuries and accidents (Christian et al., 2009). As a result, it is very important to investigate factors that can influence rule compliance and proactive safety behaviors (Griffin and Neal, 2000; Neal and Griffin, 2006). In general, when a candidate factor is (1) a proximal rather than distal predictor of the outcome variables (e.g. driving skills vs. automobile knowledge in predicting accident involvement) and (2) can be changed by deliberate interventions (e.g. training), the factor can then be regarded as a good predictor in both a theoretical (validity) and a practical (alterability) sense.

Recent research suggests that mindfulness may be such a factor. As a concept originally adopted by Buddhist tradition, mindfulness has been defined by modern scientific research as a mental state with the characteristics of present-focused awareness and attention (Bishop et al., 2004; Brown et al., 2007; Langer, 1989). As people differ in their propensity to be mindful, many efforts have been made to evaluate how dispositional mindfulness can

influence human health, cognition and behaviors (Herndon, 2008; Kohls et al., 2009; Schmertz et al., 2009). Though most focus on the effect of dispositional mindfulness on well-being (for a review, see Brown et al., 2007), recent research has witnessed its unique contribution to work performance in contexts that are dynamic, complex and safety-oriented (Dane, 2011; Dane and Brummel, 2013; Kass et al., 2011; Zhang et al., 2013). In this kind of environment, being mindful can be helpful since mindful people are more likely to have a broader attentional scope encompassing both internal and external stimuli and therefore may be more able to notice potential risks (Kontogiannis and Malakis, 2009), make unbiased judgments (Kiken and Shook, 2011) and control their unsafe or risky behaviors (Feldman et al., 2011; Lakey et al., 2007).

Though these initial findings are very exciting in establishing a link between dispositional mindfulness and performance, many questions still remain unresolved. In the first place, some research has investigated the influence of mindfulness on task performance, focusing on the efficiency of fulfilling such tasks (Dane, 2011; Shao and Skarlicki, 2009), but given the difference between behaviors that are conducted mainly to enhance efficiency and those mainly to prevent errors, a more relevant framework explaining the relationship between individual mindfulness and safety behaviors in an high risk work setting is needed (see Weick et al., 1999, 2008 for a theory of mindfulness at an organizational level). Second, more research is needed to detect whether the effect of mindfulness can be differentiated from other trait-like variables which have been repeatedly confirmed as important predictors of safety behaviors (e.g. conscientiousness). Without proving the incremental validity

* Corresponding author at: Chinese Academy of Sciences and State University of New York.

E-mail address: changxu.wu@gmail.com (C. Wu).

of dispositional mindfulness, it is hard to come to any conclusion about its uniqueness. Thirdly, it is important to investigate what variables can promote or hinder the mindfulness–performance relationship since such knowledge will expand our understanding of the inner mechanisms of mindfulness (e.g. how mindful practice can influence deliberate thinking or intuitive decision making). However, other than a very few attempts (Dane, 2011; Zhang et al., 2013), this question has received inadequate attention.

To address the above issues, in our research, we drew upon relevant literature from the dual process model of human cognition to establish a framework to account for the influence of mindfulness on safety behaviors (Brown and Ryan, 2003; Dane, 2011; Evans, 2008). In particular, we investigated whether the effect of mindfulness is additive to conscientiousness and bounded by workers' individual differences in their experience and intelligence, which are the two important characteristics of the dual process system.

1.1. A dual process perspective about safety behaviors

In high risk organizations, safety behaviors are important since lack of safety behaviors are the direct antecedents of accidents and injuries (Neal and Griffin, 2006). Based on a human performance framework, Griffin and Neal (2000) defined safety behaviors as behaviors that constitute work performance for safety-oriented tasks. They further categorized this construct into an in-role dimension and an extra-role dimension. Termed 'safety compliance', the in-role dimension refers to the core activities that are formally required to maintain workplace safety, such as adhering to standard work procedures. Meanwhile, the extra-role dimension, termed 'safety participation', describes proactive behaviors that are not directly linked to individual safety but that nevertheless help colleagues and entire organization improve safety. These behaviors include activities such as warning others when their actions may cause danger or making suggestions to the organization to improve safety related regulations.

Like all kinds of human performance, the operator's safety behavior is governed by two basic cognitive systems: (1) an unconscious, autonomous and effortless processing system (system 1) that functions at high speed, driven mainly by intuitions, heuristics, past experiences, etc.; and (2) a conscious, controlled, effortful processing system (system 2) using reasoning, fluid intelligence, etc., in a slow and serial manner (for a recent review, see Evans, 2008). Problems in the use of the dual process system can undermine operator safety behaviors.

Consider the case of operators working in a nuclear power plant control room. In most cases, operators are performing their tasks using an experience-based heuristic judgment (system 1) (Endsley, 1995; Klein, 1999). By comparing observed stimuli with prototypes stored in long-term memory, certain schemas including knowledge (e.g. alternative solutions) and actions (e.g. turning a machine off) will be activated and implemented in an associative manner without people being aware of the whole process. Generally, this is very effective in dealing with complex information and familiar situations. However, if operators erroneously categorize a new stimuli pattern as an old but fundamentally different prototype or they have stored wrong or biased prototypes (e.g. a previous established belief that taking shortcuts is harmless), they are likely to make a wrong decision. This automatic system is also important in dealing with social-motivational information. For example, recent studies have suggested that implicit attitudes (as measured by reaction time based unconscious favor over safety words) could influence safety behaviors beyond mere consideration of their explicit attitudes (Burns et al., 2006). Moreover, system 1 is important for emotional experience such as fairness perception and empathy, two important antecedents of helping

and participatory behaviors (Johnson and Lord, 2010). However, if an operator has established negative implicit attitudes or emotions, it is hard to remove their effect. While biased decisions may directly hinder safety compliance behaviors, the involvement of system 1 in the social-motivational process can play an important role in safety participatory behaviors (Neal and Griffin, 2006). As a result, the failure to use system 1 can reduce both facets of safety behaviors.

When operators encounter a new event they have never experienced before, system 2 will be activated. In this situation, operators' attention is captured by odd stimuli (or patterns) that cannot be matched with any previously established prototype. Therefore, they have to allocate their limited attentional resources to gain further information. With no ready solutions in mind, they will reason logically based on this information and basic rules and principles to form certain hypotheses about the possible root causes of the problems and implement a series of experimental solutions. However, the use of system 2 can deplete one's limited mental resources and be stressful, especially in case when under a heavy workload (Vidulich and Tsang, 2012; Xie and Salvendy, 2000). When their cognitive resources are depleted, it is very likely that they will encounter cognitive failures (e.g., fail to maintain sustained attention, make correct judgments or execute a planned action) or suffer emotional burdens such as burnout and reduced motivation (Wallace and Vodanovich, 2003; Turner et al., 2012). In all these failures to use system 2, both safety compliance and participation behaviors can be undermined.

1.2. Mindfulness and safety behaviors

It can be reasoned from current evidence that mindfulness can improve safety behaviors by improving the use of the dual system. As indicated by recent analyses, mindfulness is related to meta-cognition and executive attention which can moderate the dual system in a positive way (Brown and Ryan, 2003; Brown et al., 2007; Dane, 2011). This benefit is achieved through an improved attention toward the present moment (Brown et al., 2007; Langer, 1989) which can improve the tendency to process information received from both external stimuli and internal mental states in a deeper and more open manner (see Chiesa et al., 2011 for a recent review).

On the one hand, mindfulness is believed to improve the benefit and reduce the harm of using system 1. Being more aware of their otherwise unattended inner experiences and intuitions (Brown and Ryan, 2003; Ostafin et al., in press), mindful people are more likely to learn from these and thus improve their performance (Dane, 2011; Rerup, 2005). Evidence also suggests mindfulness training, as well as a higher level of dispositional mindfulness, can improve situational awareness,¹ which is generally known as a state of "knowing what's going on". This is highly dependant on the use of past experience and pivotal for performing functionally in high risk industries (Endsley, 1995; Vidulich and Tsang, 2012), thus providing a good basis for all types of safety behaviors (Feldman et al., 2011; Kass et al., 2011; Mrazek et al., 2013). Moreover, in the literature on self-regulation, mindfulness has been found to reduce the link between an implicit favoring of some negative object (e.g.

¹ Dispositional mindfulness and situational awareness are conceptually different from each other. Whereas the former is a trait-like construct that reflect one's proneness to maintain a present-focused attention to both internal and external environment, the latter reflects a mental state about knowing the task-related environment. In general, we can use trait-state, general-specific, and antecedent-consequence framework to understand their relationship. While mindful people are more prone to have a high level of situational awareness (SA) in various kinds of situations, people having high level of situational awareness in a particular task environment may not have high SA in another situation nor necessarily have higher level of mindfulness.

Download English Version:

<https://daneshyari.com/en/article/572297>

Download Persian Version:

<https://daneshyari.com/article/572297>

[Daneshyari.com](https://daneshyari.com)