

The Relationship between Mindfulness and Individual Adaptability in a
Dynamic Workplace

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Abstract

Purpose. Individual adaptability has been proposed as a source of adaptive performance, an increasingly important performance dimension in dynamic contexts. However, there is limited understanding of the antecedents of adaptability. Mindfulness has been shown to improve performance and well-being in the workplace, but the underlying mechanisms of this relationship are not well understood. Answering this need, we hypothesize a link between mindfulness and adaptability and conduct an empirical study to examine this relationship in dynamic work contexts.

Methodology and findings. 198 knowledge workers in dynamic workplaces completed a self-rating survey that measured mindfulness and a multifactor measure of individual adaptability. Correlation analysis found a significant positive relationship between mindfulness and individual adaptability, and also between mindfulness and five sub-factors of adaptability. Regression analysis found mindfulness could significantly predict adaptability and that mindfulness added incremental variability to various sub-scale factors of adaptability, over and above work stress adaptability. In other words, mindfulness is not simply a stress management skill but also enhances other aspects of adaptability such as learning and problem-solving.

Implications. Individual adaptability helps to explain the relationship between mindfulness, performance and well-being in the workplace. Mindfulness-Based Interventions (MBIs) have established protocols and proven outcomes in organizational and psychological literature. It may be possible to enhance individual adaptability through such MBIs and thus support adaptive performance while reducing negative impacts on individual well-being.

MINDFULNESS AND ADAPTABILITY AT WORK

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Introduction

Continuous, bottom-up adaptation by workers and managers, rather than slow-moving organizational-level change, has been proposed as the appropriate response to dynamic contexts (Wee & Taylor, 2018). The ability of individuals to initiate or respond to change (adaptability, Baard, Rench, & Kozlowski, 2014) is therefore an important ingredient of dynamic capability, which creates organizational competitiveness in such environments (Breu, Hemingway, Strathern, & Bridger, 2002; Nijssen & Paauwe, 2012). Increasing technological advances, globalization and competitive pressures are outpacing traditional approaches to change (Kotter, 2012) and this failure is reflected in rising firm level volatility (Comin & Philippon, 2006).

However, this demand for adaptability can place a great deal of stress on employees and negatively impact their sense of well-being and individual performance (Braun, Hayes, DeMuth, & Taran, 2017; Cullen, Edwards, Casper, & Gue, 2014). It is estimated that between 5-8% of total United States health care costs and up to 120 000 annual deaths are due to workplace stress (Goh, Pfeffer, & Zenios, 2016). More than 50% of all sick days in the United Kingdom are now due to poor mental health (Lomas et al., 2017).

Adaptability in the face of continuous change therefore represents an opportunity and an existential threat to both firms and employees (Bhattacharya, Gibson, & Doty, 2005). The present research is a response to the urgent need to develop the theory and practice of adaptability in a way that is sustainable for both firms and employees.

Adaptive performance (Allworth & Hesketh, 1999; Griffin, Neal, & Parker, 2007) is now recognized as a dimension of performance alongside task and context performance (Bergman, Donovan, Drasgow, Overton, & Henning, 2008; Motowidlo,

MINDFULNESS AND ADAPTABILITY AT WORK

Borman, & Schmit, 1997). Adaptive performance has been described using an eight-dimensional taxonomy of behaviors that characterize adaptation (Pulakos, Arad, Donovan, & Plamondon, 2000).

Individual adaptability is a trait which can be used to predict adaptive performance and an adaptability second-order factor structure has been proposed (Ployhart & Bliese, 2006) that accounts for the eight behavioral dimensions (Huang, Ryan, Zabel, & Palmer, 2014). Of these second-order abilities, seven are relevant to the present research: work stress adaptability; crisis adaptability; uncertainty adaptability; learning adaptability; problem-solving adaptability; inter-personal adaptability; and cultural adaptability (Ployhart & Bliese, 2006).

The antecedents of individual adaptability are not well understood (Huang et al., 2014), although the literature points to meta-awareness, resilience, positive affect and pro-social behavior as some of the potential sources (Jundt, Shoss, & Huang, 2015). Mindfulness has been found to promote meta-awareness, resilience, positive affect and pro-social behavior. It is the contribution of this present study to investigate the relationship between mindfulness and adaptability, with a view to positively impacting adaptive performance while supporting well-being.

Mindfulness has been defined as “awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 2003, p. 145) and has its roots in contemplative practices in many of the world’s religions. A secular form of mindfulness, inspired by Buddhist practices, has emerged (Lindahl, Fisher, Cooper, Rosen, & Britton, 2017) and has been a subject of academic study for 40 years, initially in the clinical, neuroscientific and psychological fields (Goleman & Davidson, 2017), but more recently in organizational science, leadership and management strategy (Good et al., 2016).

MINDFULNESS AND ADAPTABILITY AT WORK

Mindfulness has been found to be beneficial as part of programs to manage stress and pain (Kabat-Zinn, 2003), depression and anxiety (Segal, Williams, Teasdale, & Gemar, 2002), and addiction (Brewer et al., 2009). Mindfulness has also been shown to increase positive affect, pro-social behavior, physical health and cognition in healthy individuals (Brown, Ryan, & Creswell, 2007). Workplace studies have found that mindfulness can improve performance and well-being in individuals (Dane & Brummel, 2014; Lomas et al., 2017; Mesmer-Magnus, Manapragada, Viswesvaran, & Allen, 2017; Montani, Dagenais-Desmarais, Giorgi, & Grégoire, 2018).

Due to its associations with meta-awareness, resilience, positive affect and pro-social behavior, it is possible that mindfulness is related to individual adaptability and supports adaptive performance. Mindfulness may also mitigate some of the negative impact of the demand for constant adaptation in the workplace by increasing wellness through resilience to change and better stress response (Braun et al., 2017; Lomas et al., 2017). Importantly, mindfulness is something that anyone can experience. It is a skills which can be developed through certain practices (Crane et al., 2017) and its effects continue after an intervention.

This study found a positive relationship between mindfulness and certain aspects of individual adaptability which drive adaptive performance, and that mindfulness can help to buffer some of the negative effects of adaptation, by helping individuals to build resilience (work stress adaptability). This suggests that interventions can be designed to teach mindfulness skills that aid adaptability in the workplace, with positive outcomes for both performance and well-being. Digital platforms such as websites and mobile applications are becoming more commonly used for delivery of such interventions. Despite certain challenges facing this new technology (see Van Dam et al., 2018 for a review), this is a promising approach which

can be integrated into an organization's broader staff selection, training, development, performance and well-being programs (Spijkerman, Pots, & Bohlmeijer, 2016). This will allow organizations to respond to the needs of their teams while generating competitive capabilities.

Literature Review and Hypothesis Development

In this review of the literature, first we examine the sources of adaptive performance in dynamic contexts. Next, we analyze a theory of individual adaptability and propose mindfulness as an element of this model which has yet to be investigated. Then the literature of mindfulness and its impact on performance and well-being in the workplace is examined and the relevant streams of mindfulness research are discussed. Finally, we highlight evidence in the literature for the relationship between mindfulness and adaptability and propose hypotheses regarding the nature of this relationship.

Individual adaptability in dynamic contexts

The resource-based view of the firm holds that organizations create competitive advantage by developing distinctive capabilities (Wernerfelt, 1984). However, increasing competition, globalization, rate of technological change and consumer access to information are constantly eroding this advantage, forcing firms to adapt at an increasing rate. Dynamic distinctive capabilities are required to constantly innovate and remain competitive (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Organizations need to select, train, develop and performance-manage individuals in such a way as to create and nurture these dynamic capabilities at a team and organizational level (Nijssen & Paauwe, 2012; Ployhart & Moliterno, 2011). There is therefore a critical alignment required between the capabilities and performance of individuals, and desired organizational outcomes in dynamic contexts, and so we

MINDFULNESS AND ADAPTABILITY AT WORK

situate our search for sources of dynamic capabilities within the individual performance literature.

Job performance theory holds that performance can be measured as the aggregate of all behavior relevant to organizational objectives (Campbell, 1990). Importantly, this theory of job performance focuses on behavior, rather than results, because there are other factors which may affect organizational results which are not related to an individual's performance. The theory also distinguishes between behaviors which support and those which impede the organization from achieving its objectives (Campbell, McCloy, Oppler, & Sager, 1993). Researchers have also examined the relationship between individual differences (such as personality and cognitive ability) and performance and found that there is not a direct relationship; rather the influence of individual differences on performance is mediated by other variables such as knowledge and skills (Motowidlo et al., 1997). Campbell et al. (1993) found a similar pattern and listed the mediating variables as declarative knowledge, procedural knowledge and skill, and motivation. These variations on the theme can be summarized as: Individual Differences → Mediating Variable → Job Performance. We will return to this overall pattern in developing a model for mindful adaptive performance in our discussion of the results of this study.

Later theorists distinguished between two dimensions of job performance – task performance and contextual performance, on the basis that the antecedents of these two dimensions (the individual differences and mediating variables) were not the same (Motowidlo & Van Scotter, 1994). Task performance included behaviors to carry out the technical content of the work to be done, such as sales or administration, while contextual performance included behaviors that were responsive to the interpersonal, cultural and structural dynamics in the organization (Motowidlo et al., 1997). It was

MINDFULNESS AND ADAPTABILITY AT WORK

hypothesized that task performance was largely predicted by cognitive ability, while contextual performance was largely predicted by personality. Later empirical studies supported Motowidlo's theory of individual differences of task and contextual performance (e.g. Bergman et al., 2008). This distinction between performance dimension based on their antecedents is crucial in developing our model of the relationship between mindfulness and adaptive performance.

Similar to the argument for discriminating between task and contextual performance, it has been reasoned that the need for continuous adaptation by individuals to dynamic job requirements requires a specific set of individual differences (personality and cognitive ability) and is mediated by specific variables (Allworth & Hesketh, 1999; Griffin et al., 2007).

Building on the approach to job performance by Campbell and Motowidlo et al., adaptive performance can therefore be defined as “performance-directed behaviors individuals enact in response to or anticipation of changes relevant to job-related tasks” (Jundt et al., 2015, p. S55) and which draw on specific adaptability traits. Pulakos et al. (2000) used a critical cases technique to develop an eight-dimension taxonomy that defined the adaptive performance requirements of jobs. These performance dimensions were: handling work stress; handling crisis or emergency situations; dealing with uncertain or unpredictable work situations; learning work tasks, technologies and procedures; solving problems creatively; demonstrating inter-personal adaptability; demonstrating cultural adaptability; and demonstrating physically-orientated adaptability. The Job Adaptability Index was also developed by the same team – this was a measure designed for self-reporting and supervisor rating of adaptive performance behaviors. This was a useful tool for performance management; however, it did not allow researchers to examine the sources of adaptive performance.

MINDFULNESS AND ADAPTABILITY AT WORK

The area of research most relevant to this present study is focused on examining predictors of adaptive performance that lie in the individual differences between and within individuals, and other antecedents of adaptive performance (Allworth & Hesketh, 1999; LePine, Hollenbeck, Ilgen, & Hedlund, 1997; Ployhart & Bliese, 2006). To distinguish these antecedents of adaptive behavior from performance per se, reviewers of the literature, including Beard, Rench and Kozlowski (2014) and Jundt et al. (2015), have encouraged researchers to distinguish individual adaptability (an individual differences construct that predicts behavior) from adaptive performance (a dimension of job performance which is a set of relevant behaviors).

Ployhart and Bliese (2006) developed Individual Adaptability Theory and the Individual Adaptability Measure (I-ADAPT-M) to describe and measure the individual differences that could predict adaptive performance along Pulakos's eight dimensions. Ployhart defined individual adaptability as representing "an individual's ability, skill, disposition, willingness, and/or motivation, to change or fit different task, social, and environmental features" (p. 13). Individual Adaptability Theory holds that individual adaptability is a combination of eight sub-dimensions (work stress adaptability, crisis adaptability, uncertainty adaptability, learning adaptability, problem-solving adaptability, inter-personal adaptability, cultural adaptability and physical adaptability). Adaptability emerges from a set of more distal knowledge, skills abilities and other characteristics (KSAOs, Krumm, Kanthak, Hartmann, & Hertel, 2016) that most contribute to adaptability, creating a "composite KSAO". These KSAOs include cognitive ability, personal traits, preferences, and stress and coping skills. Each adaptability sub-dimension is a mixture of different KSAOs, in different proportions. For example, the model predicts emotional stability to be more strongly related to crisis adaptability than to learning adaptability (Ployhart & Bliese, 2006).

If one considers mindfulness as one such KSAO, we can test this theory empirically by examining the relationships between mindfulness and the compound adaptability dimension, and between mindfulness and the various sub-dimensions of adaptability. Based on the mindfulness literature and I-ADAPT theory, we would expect to see different relationships emerge, some with larger effect sizes than others. We develop these hypotheses after examining the mindfulness literature.

Mindfulness in the workplace

Mindfulness is a practice used in the contemplative traditions of many religions (Brown et al., 2007). However, the primary source for modern mindfulness comes from the Buddhist canon, which developed from the 5th century BCE (Feng, Krägeloh, Billington, & Siegert, 2018). The Buddhist tradition has diverged into many varied forms across the Indian sub-continent, south-east Asia and the far east, each with its own meditative practices (Kabat-Zinn, 2003). However, all these variants have at their core the same fundamental idea of mindfulness, as taught by the Buddha in key discourses (Brown & Ryan, 2003).

Through a process of interaction over several generations, many of these Buddhist traditions have begun to be practiced and taught beyond their Asian origins. Out of this process, both a “western” Buddhist tradition and a “secular” or “scientific” approach to the practice and the study of mindfulness have developed (Lindahl et al., 2017). The number of scientific papers on mindfulness published per year has increased from about 100 in 2000 to over 1000 in 2015 (Van Dam et al., 2018) and mindfulness training is now conducted in organizations such as Google and Apple, and even the US Army. The initial focus of mindfulness studies was in the fields of medicine, psychology and neuroscience, however there has been a recent surge of interest from management, organizational and leadership researchers (Lyddy & Good,

2017) including in this journal (e.g. Montani et al., 2018). It is within this scientific approach to mindfulness in work settings that the present research is situated.

Mindfulness describes a unique quality of attention and awareness which is not the same as concentration, flow (Csikszentmihalyi, 2014) or other forms of meditation: “Attention by itself may be focused, but only when coupled with meta-awareness – an apprehension of the current state of mind that monitors and focused attentiveness – does it become mindfulness” (Good et al., 2016, p. 117). Mindfulness has been defined as “awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 2003, p. 145). Dane and Brummel neatly captured the essence of mindfulness as “attending to the present moment while maintaining a wide breadth of attention” (2014). Importantly, mindfulness is something that anyone can experience and can be increased through certain practices (Crane et al., 2017); and its effects continue after an intervention. In other words, mindfulness is not only a temporary state, nor is it a fixed trait, limited to certain individuals. Rather it is a trait-like skill that can be taught and developed: pre-existing trait-level mindfulness can be increased to a new stable level through practice. Neuroplasticity, specifically changes in the amygdala and greater cerebral cortex activation, may underpin this “trainable” aspect of mindfulness (Goleman & Davidson, 2017).

Scholars of mindfulness have attempted to dissect its constituents, for example into intention, attention and attitude (Lomas et al., 2017); or characterized it as experiential and non-attached, rather than narrative, conceptual and ego-driven (Brown et al., 2007). A recently developed integrative model shows mindfulness acting through improved attention (increased stability, control and efficiency of attention) to regulate other functional dimensions - cognition, emotion, physiology and behavior. By improving the functioning of individuals in these areas, mindfulness has positive

MINDFULNESS AND ADAPTABILITY AT WORK

impacts on aspects of performance, well-being and interpersonal relationships (D. J. Good et al., 2016). Clearly, such watchful clear-sightedness of the external environment and one's own inner workings is an advantage in business and all aspects of life.

Mindfulness has been found to help manage chronic pain (Kabat-Zinn, 1982); to assist in cognitive therapy programs to prevent depression relapse (Segal et al., 2002); and in other therapeutic modalities such as Acceptance and Commitment Therapy and Dialectical Behavior Therapy (Brown et al., 2007). People who score higher on mindfulness tests report higher levels of subjective well-being and lower levels of emotional turbulence (Brown & Ryan, 2003). Mindfulness is also associated with better physical health, including better sleep (Hülshager, Walkowiak, & Thommes, 2018), inclination to exercise more, less avoidance of health issues and reduced self-medication with drugs and alcohol (Hue & Lau, 2015).

There is a substantial body of evidence from workplace studies that mindfulness-based interventions can reduce mental health problems in the workplace (e.g. stress, burnout, anxiety and anger) and enhance measures of well-being, e.g. job satisfaction (Lomas et al., 2017). Mindfulness has also been found to enhance work relationships, perhaps through increased empathy and ability to create distance from ego-centered thought processes and narrative-style sense-making (Brown et al., 2007). Most recent research supports a positive link between mindfulness and workplace performance. In a 2017 review of empirical studies of mindfulness, specifically in the workplace, 37 out of 43 longitudinal studies showed an improvement in performance after a mindfulness-based intervention (MBI), while 17 cross-sectional, non-intervention studies found a positive association between mindfulness and performance (Lomas et al., 2017).

MINDFULNESS AND ADAPTABILITY AT WORK

There is less agreement on which aspects of performance are improved. The same article listed 26 different measures of performance which showed improvements in the various studies reviewed (Lomas et al., 2017). However, some authors have attempted to hone in on a more definitive list of performance dimensions. In a 2016 integrative review of existing empirical research for the *Journal of Management*, mindfulness was found to impact five performance aspects: improved job and task performance, more ethical and prosocial behavior, less deviance and better attention to safety issues (Good et al., 2016). In a review of thousands of mindfulness studies, two authors who have been studying the subject since the 1970s, neuroscientist Richard Davidson and science writer Daniel Goleman, concluded that mindfulness had four benefits which are relevant to individual performance in the workplace: stronger focus, staying calmer under stress, better memory, and good corporate citizenship (Goleman & Davidson, 2017).

Recent work has also distinguished mindfulness from other constructs with positive workplace implications: a study of workers in the service industry found that in dynamic work environments, mindfulness facilitates job performance independent of engagement. Mindfulness was also found to be negatively related with intention to turnover (Dane & Brummel, 2014). Mindfulness may also have specific leadership benefits (Roche, Haar, & Luthans, 2014), over and above general workplace performance. In a 2017 Australian study of 84 senior managers, those with higher mindfulness were found to score higher on core leadership self-mastery skills and also on leadership organizational-transformation measures, as rated by their immediate managers (King & Haar, 2017).

Mindfulness and individual adaptability

The literatures on mindfulness and individual adaptability suggest a theoretical link between the two concepts which will be tested empirically in this study. I-ADAPT theory defines individual adaptability as “an individual’s ability, skill, disposition, willingness, and/or motivation, to change or fit different task, social, and environmental features”. The theory also holds that individual adaptability is determined by a composite set of KSAO’s that include cognitive ability, certain personality traits, preferences, and stress and coping skills. (Ployhart & Bliese, 2006). It is proposed that mindfulness is a distal KSAO that impacts individual adaptability, due to its affects, through heightened attention with meta-awareness, on the functional domains of cognition, emotion, behavior and physiology (Lomas et al., 2017; Mesmer-Magnus et al., 2017). We therefore hypothesize:

Hypothesis 1: Mindfulness is positively related to individual adaptability.

Work stress adaptability is characterized by resilience under time pressure, high workload or difficult circumstances, and by the ability to exhibit constructive behaviors, such as resisting overreacting or blaming others under pressure (Braun et al., 2017). By de-coupling an individual’s sense of identity from an experience (for example a verbal attack by a hostile customer) mindfulness may be able to increase work stress adaptability in individuals (Brown et al., 2007). Mindfulness may reduce emotional reactivity to negative events (Hülshager, Alberts, Feinholdt, & Lang, 2013). Further, mindfulness may shorten the lifecycle of emotions, reducing the time taken for an emotion to peak and return to baseline (Goleman & Davidson, 2017). We therefore predict:

Hypothesis 2: Mindfulness is positively related to work stress adaptability.

Crisis adaptability refers to the ability to handle emergency situations appropriately, including identifying the issue and reacting swiftly, as well as remaining calm and focused in an emergency (Jundt et al., 2015). Mindfulness has been associated with greater equanimity when faced with unpleasant or challenging events, and the ability to remain engaged without excessive reactivity (Lomas et al., 2017); mindfulness may also assist with the physiological reaction to a crisis, for example in regulating blood pressure (Brown et al., 2007). The ability to focus during a crisis, and allocate attention efficiently at will, is also a noticeable quality of more mindful individuals (Lyddy & Good, 2017). We therefore hypothesize:

Hypothesis 3: Mindfulness is positively related to crisis adaptability.

Uncertainty adaptability is the ability to remain effective in ambiguous or changing situation; to be able to make decisions without holding a full picture and being able to change course if necessary (Cullen et al., 2014). Dane's contingency theory of mindfulness (Dane, 2011) explains the role of mindfulness in widening attentional breadth, which may be valuable for experts in novel situations, especially in dynamic environments. By stabilizing attention and increasing cognitive flexibility, it is possible that mindfulness has a buffering effect which protects performance from environmental changes and discontinuity (Jha et al., 2015). A link has also been found between mindfulness and fluid intelligence (Lyddy & Good, 2017). We therefore predict:

Hypothesis 4: Mindfulness is positively related to uncertainty adaptability.

Learning adaptability is characterized by enthusiasm for and pro-active seeking out of new knowledge and training in new processes, technology or job requirements. It also suggests a capacity to learn new skills and tasks (Bohle Carbonell, Könings, Segers, & van Merriënboer, 2016; Le Pine, Colquitt, & Erez, 2000). Mindfulness may be related to learning: it has been shown to be positively related to greater working memory capacity (Jha, Stanley, Kiyonaga, Wong, & Gelfand, 2010; Ruocco & Direkoglu, 2013) and to increased cognitive flexibility (Good et al., 2016). The relationship between mindfulness and self-regulation (Glomb, Duffy, Bono, & Yang, 2011) may also enable reflective learning where mindfulness enables conscious choice of new behaviors over mindless automatic responses, producing more adaptive outcomes. We therefore hypothesis:

Hypothesis 5: Mindfulness is positively related to learning adaptability.

Problem-solving adaptability involves the ability to use fresh perspectives and integrative approaches to solve problems creatively and generate novel solutions. Individuals with this ability are able to use limited resources and think “outside the box” to find solutions where others might not (Baard et al., 2014; D. Good, 2014). Mindfulness has been linked to creativity and divergent and convergent thinking (Colzato, Ozturk, & Hommel, 2012) as well as insight problem solving (Ostafin & Kassman, 2012). The mechanisms at work are likely the broad attentional breadth of mindfulness and the ability to let go of previous concepts and emotions (Kabat-Zinn,

2003). Mindful individuals may also be more likely to work past obstacles and to set challenging goals (Glomb et al., 2011) We therefore predict:

Hypothesis 6: Mindfulness is positively related to problem-solving adaptability.

Interpersonal adaptability is the ability of individuals to be flexible and open-minded when working with a diverse range of other people; to be open to feedback from others and develop good working relationships (Ployhart & Bliese, 2006; Pulakos et al., 2000). Research suggests that mindfulness can improve interpersonal relationships via enhanced empathy and better regulation of emotions (Hülshager et al., 2013) and behavior (Mesmer-Magnus et al., 2017). Mindful individuals are less judgmental of others and more charismatic (Glomb et al., 2011). These positive outcomes are seen at both the dyadic level, for example in supervisor/team member relationships, and also within teams through improved communication quality, relationship quality and empathy (King & Haar, 2017).

Cultural adaptability includes the ability or inclination to try to understand or learn about people or groups from different cultures. It could also include taking active steps to adjust behaviors or appearance to fit in or comply with different cultural norms, and an understanding of the implications of one's actions for people from different cultures (Huang et al., 2014). The aspects of mindfulness already mentioned regarding inter-personal adaptability are likely to pertain to cultural adaptability: enhanced empathy, and better regulations of emotions and behavior. We therefore hypothesize:

MINDFULNESS AND ADAPTABILITY AT WORK

Hypothesis 7: Mindfulness is positively related to cultural adaptability; and

Hypothesis 8: Mindfulness is positively related to inter-personal adaptability.

Much of the early organizational literature on mindfulness focused on stress management and well-being, however the evidence examined for Hypotheses 2-8 from the adaptability and mindfulness literature suggests that mindfulness may in fact predict various aspects of adaptability, beyond work stress adaptability. We therefore hypothesize:

Hypothesis 9: Mindfulness predicts individual adaptability, over and above the aspect of work stress adaptability.

Method

Participants and procedures

We conducted a cross-sectional study to test the proposed hypotheses. Data was collected from 198 respondents using an online questionnaire. Participants who met the criteria of working in a dynamic context were approached by email, LinkedIn and Facebook. In total 2194 individuals were approached, producing 255 responses and 198 qualified responses. The overall response rate was 12% and the completion rate was 87%.

The employees at a South African Internet TV company were approached because the company faced a high degree of external competition (from Netflix, Apple and Amazon), rapid product iteration and changes in customer expectations. The company had also been through three structural re-organizations in three years. Executive MBA students at the Gordon Institute of Business Science in Johannesburg, South Africa, were invited to participate because no matter the nature of their industry,

MINDFULNESS AND ADAPTABILITY AT WORK

the combined pressure of working full time in a corporate, or running one's own business, while simultaneously studying towards an MBA, created a dynamic, high-pressure environment for the respondents. Another characteristic of this cohort that made it relevant to the study was the high number of individuals who had experienced career change during the course. This in itself created a highly dynamic environment for this cohort. Staff at two digital media agencies in Johannesburg and Cape Town, South Africa, a highly dynamic industry, were also approached. Finally, the survey was also shared on LinkedIn and Facebook, and respondents who met the criteria of working in a dynamic context were included.

The sample demographics were as follows: 56% were female and one respondent was transgender; they ranged in age from under 30 (11%), 30 to 39 (53%) and 40 to 49 (27%), to 50 years and older (10%); 25% had been with their organization for less than two years, 30% between two and five years and 23% from six to nine years. Participants held a variety of levels of seniority: 23% were specialists, 15% were senior specialists, 18% were junior managers, 21% were senior managers, 9% were heads of department and 16% were executives. Participants worked in dynamic contexts; 35% were employees of a Video on Demand company, 26% were executive MBA students, 11% worked for digital marketing agencies, and the remaining 28% worked in various dynamic industries such as telecoms, financial services and media.

Measures

Mindfulness. The Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003), a 15-question instrument was used to measure mindfulness ($\alpha = .89$). Respondents say how often they experience each statement, using a six-point Likert scale, where high scores reflect more mindfulness. The psychometric reliability and validity of the MAAS has been proven through exploratory factor analysis and

MINDFULNESS AND ADAPTABILITY AT WORK

confirmatory factor analysis (Brown & Ryan, 2003). Further confirmation that the MAAS is a reliable and valid instrument has been provided by a further independent psychometric validation (MacKillop & Anderson, 2007) and its use in numerous subsequent studies. With more than 5000 citations, MAAS is by far the most cited measure of mindfulness (Van Dam et al., 2018). MAAS is recommended for measuring mindfulness in the workplace in a comprehensive review of studies by the Journal of Management (Good et al., 2016).

Individual adaptability. An adapted version of the I-ADAPT-M scale (Ployhart & Bliese, 2006) was used to measure individual adaptability ($\alpha = .78$) and its seven sub-factors: work stress adaptability ($\alpha = .80$), crisis adaptability ($\alpha = .78$), uncertainty adaptability ($\alpha = .68$), learning adaptability ($\alpha = .81$), problem-solving adaptability ($\alpha = .80$), interpersonal adaptability ($\alpha = .70$), and cultural adaptability ($\alpha = .78$). The I-ADAPT-M scale includes questions such as “I enjoy learning new approaches for conducting work” and uses a six-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). This is a psychometrically sound instrument that has been rigorously developed using translation and re-translation and then tested for convergent and discriminant validity as well as confirmatory factor analysis. The I-ADAPT-M measure is recommended in a Journal of Management review of the adaptability literature (Baard et al., 2014).

Results

Correlation analysis using Spearman’s Coefficient of Rank Correlation in IBM SPSS25 confirmed Hypotheses 1-6 and rejected Hypotheses 7 and 8. Reported in Table 1 are means, standard deviations, and correlations among the focal variables. Mindfulness was positively related to adaptability ($\rho = .39$), and the sub-

MINDFULNESS AND ADAPTABILITY AT WORK

factors work stress adaptability ($\rho = .50$), uncertainty adaptability ($\rho = .20$), crisis adaptability ($\rho = .28$), learning adaptability ($\rho = .20$), all $p < .01$. Mindfulness was also positively related to problem-solving adaptability ($\rho = .18$, $p < .05$). There was no significant relationship between mindfulness and inter-personal adaptability or cultural adaptability.

Table 1: Descriptive statistics and correlations

Variable	<i>M</i>	<i>SD</i>	5	6	7	8	9	10	11	12	13
5. Mindfulness	3.94	.78	(.89)								
6. Adaptability	4.59	.46	.38**	(.78)							
7. Work stress adapt.	3.72	1.01	.48**	.62**	(.80)						
8. Uncertainty adapt.	3.84	.72	.23**	.69**	.45**	(.68)					
9. Crisis adaptability	4.89	.64	.29**	.69**	.39**	.40**	(.78)				
10. Learning adapt.	4.89	.62	.20**	.65**	.20**	.32**	.37**	(.81)			
11. Creative adapt.	4.63	.65	.16*	.71**	.29**	.43**	.39**	.51**	(.80)		
12. Inter-personal adapt.	4.97	.53	.06	.56**	.08	.27**	.36**	.39**	.42**	(.70)	
13. Cultural adapt.	5.18	.57	.13	.66**	.15*	.40**	.40**	.44**	.45**	.63**	(.78)

$N = 198$. Internal consistency coefficients (Cronbach's alphas) appear along the diagonal in parentheses

Correlations calculated using Spearman's Coefficient of Rank Correlation

* $p < .05$; ** $p < .01$

Hypothesis 9 was confirmed: the degree of mindfulness in an individual can predict the level of adaptability in that person, even when the aspect of work stress adaptability is removed. A regression analysis established that mindfulness could predict adaptability, $F(1, 195) = 36.12$, $p < .05$. Mindfulness accounted for 15.6% of the variation in adaptability with adjusted R Square = 15.2%, a medium size effect according to Cohen (1988). The prediction equation was: $\text{adaptability} = 3.729 + .213 * \text{mindfulness}$.

MINDFULNESS AND ADAPTABILITY AT WORK

In a second regression, mindfulness predicted a measure of adaptability excluding work stress ability, $F(1, 195) = 13.639, p < .05$. Mindfulness accounted for 6.5% of the variation in adaptability with adjusted R Square = 6.1%, a small size effect. The prediction equation was: $\text{adaptability (excluding stress)} = 4.121 + .138 * \text{mindfulness}$.

Validity and reliability

Prior to hypothesis testing, exploratory factor analysis (EFA) was performed on the scales using principal components analysis (PCA) in IBM SPSS 25. The suitability for PCA was assessed prior to analysis. Inspection of the correlation matrix showed that all items had at least one correlation coefficient greater than 0.3, except for one question measuring uncertainty adaptability (Uncertainty 5) and one question measuring inter-personal adaptability (Inter-personal 1). These two items were removed. The overall Kaiser-Meyer-Olkin (KMO) scores for the scales ranged from 0.7 (middling) to 0.93 (marvelous), and there were no individual item KMO scores below 0.663. Bartlett's test of sphericity was statistically significant ($p < .0005$) in all cases, indicating that the data was likely factorizable. Details of the EFA are presented in Table 2.

Table 2: Exploratory Factor Analysis

Variable	KMO		Bartlett Sig.	Components	% Var.
Mindfulness	.928	Marvelous	.000	2*	56.3
Adaptability	.801	Meritorious	.000	2*	62.36
Work stress adaptability	.769	Middling	.000	1	55.76
Uncertainty adaptability	.700	Middling	.000	1	50.98
Crisis Adaptability	.801	Meritorious	.000	1	54.6
Learning adaptability	.790	Middling	.000	1	57.08
Problem-solving adaptability	.818	Meritorious	.000	1	55.2
Inter-personal adaptability	.706	Middling	.000	1	54.75
Cultural adaptability	.777	Middling	.000	1	53.3

Extraction method: Principal components analysis

Rotation method: Oblimin with Kaiser Normalisation

$p < .001$

The initial extraction for mindfulness revealed three components that had eigenvalues greater than one. However, two items in the scale (Mindful 1 and Mindful 4) displayed cross-loading above 0.4 and were removed. In addition, another item (Mindful 6) was removed due to low factor loading revealed during CFA. This 12-item set was then rotated again and revealed a two-factor solution which explained 56.3% of the total variance. An Oblimin Oblique rotation was employed because the factors were conceptually related (Beavers et al., 2013). The rotated solution exhibited “simple structure” (Tabachnick & Fidell, 2007) and the interpretation of the data was consistent with the attributes the questionnaire was designed to measure, with strong loadings of “Awareness” items on component one and “Attention” items on component two. Mindfulness is hypothesized to include awareness and attention, according to the MAAS creators (Brown & Ryan, 2003).

The initial extraction for the first-order adaptability construct revealed two components that had eigenvalues greater than one which explained 45.42% and 16.93% of the total variance, respectively. An Oblimin rotated solution exhibited “simple structure” and met the interpretability criterion. Component one had strong loadings for

MINDFULNESS AND ADAPTABILITY AT WORK

pro-active traits (inter-personal, cultural, learning and problem-solving adaptability) while component two included more reactive traits (work stress, crisis and uncertainty adaptability). This structure was in line with I-ADAPT theory (Ployhart & Bliese, 2006) and similar to the mapping described by Huang et al. (2014), except for inter-personal and cultural adaptability. All second-order adaptability constructs extracted as a single factor. The rotated solutions are presented in Table 3.

Table 3: Rotated component loadings

	Mindfulness		Adaptability	
	Awareness	Attention	Proactive	Reactive
Mindfulness 10	.878		Interpersonal	.884
Mindfulness 8	.874		Cultural	.814
Mindfulness 7	.85		Learning	.660
Mindfulness 9	.826		Creativity	.618
Mindfulness 14	.709		Stress	.921
Mindfulness 5	.618		Uncertainty	.704
Mindfulness 12	.523		Crisis	.550
Mindfulness 11	.519			
Mindfulness 2		.831		
Mindfulness 15		.693		
Mindfulness 13		.601		
Mindfulness 3	.361	.460		

Extraction method: Principal components analysis
 Rotation method: Oblimin with Kaiser Normalisation

Confirmatory Factor Analysis was conducted using IBM AMOS 25. In the Mindfulness scale, Mindful 6 was found to have a factor loading below .40 and was therefore removed. (Hair, Black, Babin, & Anderson, 2010). Analysis of the scales that measured the second-order factors of adaptability revealed that two items (Interpersonal 1) and (Uncertainty 5) loaded at .29 and .38 respectively. These two items were removed. This finding was in line with the EFA finding for these items (inter-item correlations of below 0.3).

MINDFULNESS AND ADAPTABILITY AT WORK

The results for chi-squared test, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean square residual (SRMR) are reported in Table 4. It should be noted that due to a relatively small sample size and data not being normally distributed, not all the of the results fall within generally acceptable parameters. However, the constructs have been retained due to the EFA results previously obtained (T. A. Schmitt, 2011) and because the results met the interpretability criterion.

Table 4: Confirmatory Factor Analysis

Variable	SRMR	X2 Probability	CFI	RMSEA
Mindfulness	.0571	0	.929	.068
Adaptability	.0781	0	.848	.06
Work stress adaptability	.0583	.001	.949	.129
Uncertainty adaptability	.0215	.695	1	0
Crisis Adaptability	.0293	.138	.988	.058
Learning adaptability	.0538	.002	.958	.119
Problem-solving adaptability	.0306	.113	.985	.063
Inter-personal adaptability	.0485	.031	.959	.086
Cultural adaptability	.0432	.003	.949	.113

N = 198.

Maximum Likelihood Estimation in SPSS AMOS

CFI: comparative fit index, RMSEA: root-mean-square error of approximation,

SRMR: standardized root-mean-square residual

Reliability was tested using Cronbach's alpha. All items were measured at >0.7 , indicating reliability (Bland & Altman, 1997), except uncertainty adaptability (.68). However, the scale was retained unmodified because there was very high inter-item total correlation between uncertainty and the other dimensions of adaptability. In addition, it is not unusual to find lower reliability scores with scales that have a small number of items (uncertainty had only four items), and removing items did not improve the reliability. Reliability measures for all items are shown in Table 1.

Discussion

Theoretical Implications

The positive relationship discovered between mindfulness and individual adaptability (Hypothesis 1) is an important finding and points to a role for mindfulness in developing adaptive performance in dynamic contexts which require innovation or change management (Wee & Taylor, 2018). The multi-factor structure of adaptability revealed in EFA (proactive and reactive components) and the more mixed findings around the second-order constructs of individual adaptability suggest that the exact ways in which mindfulness influences performance and well-being in the workplace, through individual adaptability, may be complex and need further investigation (Cullen et al., 2014).

The positive relationships found between mindfulness and the second-order constructs of crisis adaptability, uncertainty adaptability, learning adaptability and problem-solving adaptability (Hypotheses 3-6) suggest that mindfulness is not just a coping skill that moderates stress and supports wellness, but is a potential tool for improving performance and business outcomes in dynamic situations which require adaptability (Good et al., 2016). This suggestion is reinforced by the results of the regression analysis of mindfulness against the adaptability construct with work-stress adaptability excluded (Hypothesis 9): mindfulness significantly predicted variability in this version of adaptability excluding work stress adaptability.

An area for further research would therefore be to investigate the link between these aspects of individual adaptability (crisis, uncertainty, learning and problem-solving adaptability) and adaptive performance itself (Huang et al., 2014; Jundt et al., 2015). This would require a satisfactory measure of behavior, for example supervisor ratings or a laboratory test of behavior (Baard et al., 2014; Bell & Kozlowski, 2008;

Good, 2014). The relationships between mindfulness, adaptability and adaptive performance could then be further clarified.

Given the large number of studies empirically confirming the link between mindfulness and stress management (Brown & Ryan, 2003; Brown et al., 2007; Kabat-Zinn, 2003; Lomas et al., 2017) the confirmation of Hypothesis 2 was not surprising. However, the mechanism by which work stress adaptability might act to reduce stress may not be straightforward. It has been proposed that the ability to adapt to changes in the workplace, which aides adaptive performance, may also be responsible for generating workplace stress (Braun et al., 2017). In other words, adaptable individuals experience stress due to their efforts to “change or fit” (Ployhart & Bliese, 2006) to meet the new requirement. If this is the case, then work stress adaptability may be a moderator of this negative relationship between other aspects of adaptability and work stress. A recent study in this journal showed that mindfulness can moderate the potentially negative effects on innovation (a form of adaptive performance) of low-activated negative affects — i.e. feelings of sadness, unhappiness and hopelessness (Montani et al., 2018). An area for further research therefore, would be to measure work stress and performance in a sample and investigate the exact relationship between mindful adaptability which drives performance (and potentially also stress) and mindful adaptability which aides in coping with stress.

A surprising finding, given the literature which supports a link between mindfulness and open-mindedness, empathy and pro-social behaviors (Brown et al., 2007) was that there was no significant statistical support for Hypotheses 7 and 8. One possible explanation is that inter-personal adaptability (M=4.97) and cultural adaptability (M=5.18) received the highest mean scores out of the adaptability constructs and were scored significantly higher than mindfulness (M=3.94); this may

MINDFULNESS AND ADAPTABILITY AT WORK

have reduced the variability between scores on these dimensions and eliminated any significant correlations. The reason participants scored themselves highly on these dimensions may have been social pressure (Arnold & Feldman, 1981) to appear open to other people and cultures in a business environment such as South Africa, where the study was conducted. It is also possible that these aspects of adaptability are not related to mindfulness (as measured by MAAS), but may be promoted by other forms of meditation such as loving-kindness and compassion (Salzberg, 2011).

On the basis of these findings and implications, we propose a model of mindful adaptive performance, as illustrated in Figure 1.

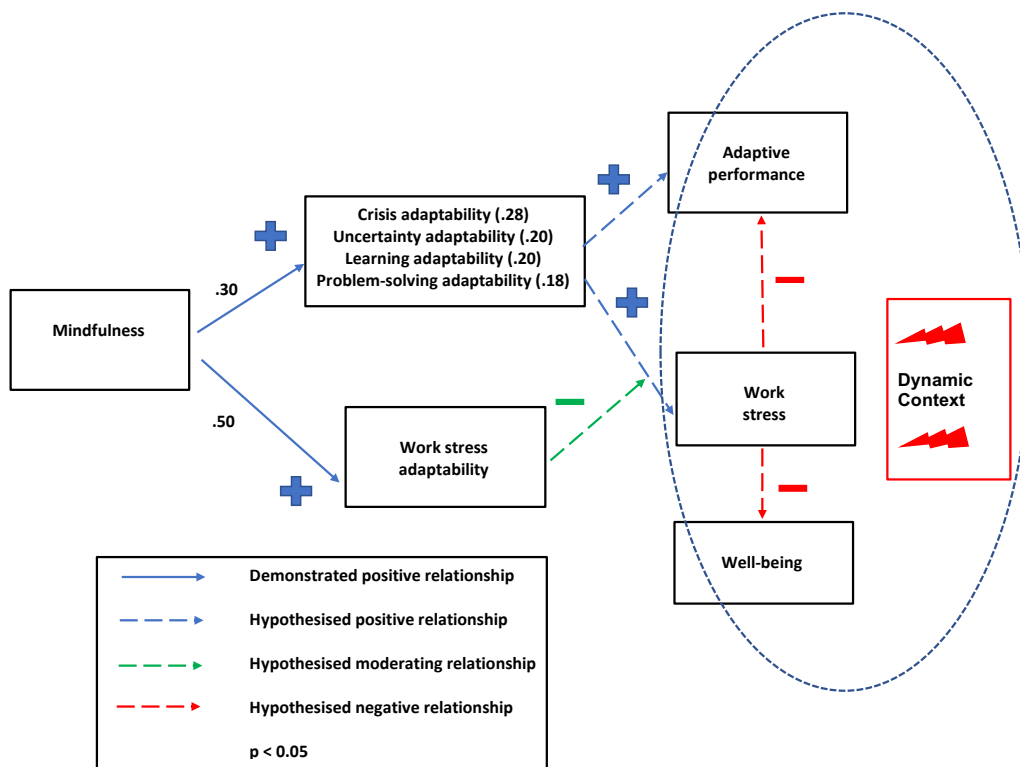


Figure 1: A model of mindful adaptive performance

According to this model, mindfulness is positively related to various aspects of adaptability (crisis, uncertainty, learning and problem-solving adaptability) and promotes adaptive performance in dynamic contexts. Unfortunately, these same

MINDFULNESS AND ADAPTABILITY AT WORK

adaptability traits may actually increase work stress. However, mindfulness is also positively related to work stress adaptability, which moderates the negative effects of adaptability. This reduces the impact of work stress, promoting well-being in the workplace. In this way, the model explains how mindfulness, through its relationship with adaptability, has a positive relationship with both performance and well-being in dynamic work contexts.

Practical Implications

According to the mindful adaptive performance model, developing the skill of mindfulness will improve various aspects of adaptability (crisis, uncertainty, learning and problem-solving adaptability) leading to improved adaptive performance, while also improving work stress adaptability, with positive outcomes for both adaptive performance and well-being. Therefore, practical interventions should be sought to increase mindfulness in the workplace.

MBIs such as Mindfulness-Based Stress Reduction have established protocols with proven outcomes for increasing mindfulness (Brown et al., 2007; Crane et al., 2017; Kabat-Zinn, 2003; Lomas et al., 2017). However, conducting such programs in the workplace can also entail significant expense and time, may include protocols that are over-focused on stress and medical outcomes, and may not be compatible with a company's culture (Hales, Kroes, Chen, & David Kang, 2012; Vich, 2015). More appropriate variations on the original MBI format are required for company settings which focus on performance enhancement (adaptability) in addition to well-being (stress management support). Workplace programs should be strictly secular and aligned to business outcomes and company culture. In addition, delivery mechanisms which reduce cost/time impacts and allow for self-study would be more suitable than programs that rely exclusively on trainer-delivered, in-person instruction.

Online MBIs are a recent development and potential solution to many of these issues; however, they have largely been trialed in clinical settings (Cavanagh et al., 2018; Spijkerman et al., 2016). Several concerns have also been raised about the effectiveness, appropriateness and ethics of online MBI delivery (Davidson & Dahl, 2018; Van Dam et al., 2018). These concerns need to be adequately addressed by program design, content and digital delivery methods.

Limitations and Directions for Future Research

Self-report scales are susceptible to social desirability and common method bias (Arnold & Feldman, 1981; Conway & Lance, 2010). However, it has also been argued that self-reports are appropriate and accurate measures of private events such as a quality of consciousness and perceptions of individuals towards change and uncertainty (Chan, 2009). Nevertheless, we followed Conway and Lance's suggestion (2010) and attempted to remediate the possibility of bias and limit participants fears that they may be judged by protecting participants' anonymity. The questions were administered electronically and there was no direct face-to-face contact between the researcher and the respondents. In addition, the introduction to the survey questions encouraged respondents "Describe yourself as you generally are now, not as you wish to be" and also explained that "there are no right or wrong answers". The MAAS scale itself attempts to address self-report bias by using indirect endorsements of mindfulness. In other words the scale actually measures "mindlessness", which is likely more accessible to most individuals (Brown & Ryan, 2003). Nevertheless, the results for Hypotheses 7 and 8 suggest that bias may have been at play. In further research, neuroimaging (Goleman & Davidson, 2017) or behavioral measures of mindfulness such as breath-counting (Levinson, Stoll, Kindy, Merry, & Davidson, 2014) could be employed to further address this limitation.

Another limitation of the study is that it didn't examine more deeply the effects of expertise on the mindfulness-adaptability relationship. Contingency theory suggests that experts would benefit from mindfulness in novel situations, but that novices could actually see performance decrements (Dane, 2010). Only categorical tenure data was collected, which did not allow for advanced statistical analysis. Future studies could collect continuous data on tenure and examine the possible influence of contingency theory.

Most importantly though, the cross-sectional nature of the present study, and the absence of performance and well-being data, meant that the relationship between mindfulness, adaptability and adaptive performance could not be comprehensively investigated. Researchers would be able to draw causal conclusions from the results of an experimental, longitudinal study that implemented an MBI, with appropriate controls, and also included performance and well-being measures. The full nomological network could then be described in detail. For example, I-ADAPT theory suggests an alternative explanation for the mindfulness-adaptability relationship: that mindfulness may be a mediator between adaptability and performance itself, instead of (or in addition to) being a KSAO of adaptability (Cullen et al., 2014). Increased mindfulness may also aid the process through which individual level adaptability interacts with more proximal factors, for example organizational structure and culture (Ployhart & Bliese, 2006), to create adaptive performance at the individual team and organizational level. The multi-factor nature of adaptability found during factor analysis suggests a potentially complex interplay between mindfulness, adaptability and performance/well-being outcomes. A more comprehensive longitudinal study of the entire mindful adaptive performance model, involving an MBI, could investigate these possibilities further.

Conclusion

This study measured mindfulness and adaptability in a sample of workers in dynamic contexts. We found a positive relationship between mindfulness and adaptability, and also between mindfulness and the sub-factors work stress adaptability, uncertainty adaptability, crisis adaptability learning adaptability and problem-solving adaptability. This suggests an important role for mindfulness in promoting adaptability in dynamic contexts. We also found that mindfulness could predict adaptability, even when work stress adaptability was excluded, which could mean that mindfulness is not simply a stress management skill but also enhances other aspects of adaptability such as learning and problem-solving. The relationship between performance and well-being, and the proactive components of adaptability (such as learning adaptability) and reactive components (such as work stress adaptability) may be complex. However, the evidence suggests that the positive effects of mindfulness on both performance and well-being may be explained by its positive relationship with both these aspects of adaptability.

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