

Focal Article

Mindfulness at Work: A New Approach to Improving Individual and Organizational Performance

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In recent years the concept of mindfulness has become increasingly popular, and with good reason. A growing body of research indicates that mindfulness provides a number of physical, psychological, and even performance benefits. As a result, some organizations have started offering mindfulness programs to their employees. But despite growing interest, mindfulness has received little attention from the industrial–organizational community. In this article, we provide an overview of what mindfulness is, where the concept came from, how it has been utilized and studied to date, and what its application in the work setting is. We also propose new directions for researchers and practitioners.

In recent years the concept of mindfulness has become increasingly popular among various audiences, including organizational leaders, employees, consultants, coaches, and psychologists. PsycINFO includes over 2,000 articles, books, and dissertations addressing mindfulness (Glomb, Duffy, Bono, & Yang, 2012), and Amazon.com has over 2,000 books on mindfulness.

One probable reason for this popularity is a growing body of research showing that mindfulness provides a number of physical and psychological benefits. For decades now, clinical psychologists and medical doctors have used mindfulness techniques to help people cope with a range of illnesses,

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including depression, anxiety, and chronic pain (Baer, 2003). In recent years, researchers have started exploring the workplace benefits of mindfulness, finding that mindfulness may improve everything from social relationships, resiliency, and task performance (Glomb et al., 2012) to task commitment, enjoyment, and memory (Levy, Wobbrock, Kaszniak, & Ostergren, 2012).

As a result, many organizations and corporations have started offering mindfulness programs to their workforce. Companies including Aetna (Wolever et al., 2012), General Mills (Gelles, 2012), and Google (Kelly, 2012) have established mindfulness training programs in order to enhance employee well-being and effectiveness. The U.S. Army has implemented the Mindfulness-Based Mental Fitness program, with positive results (Jha, Stanley, Kiyonaga, Wong, & Gelfand, 2010). Harvard Business School, Drucker Graduate School of Management, Stern School of Business at New York University, and Boalt Hall School of Law at the University of California, Berkeley, represent just some of the graduate schools that have implemented formal mindfulness programs to support their students' success.

Mindfulness is also generating a great deal of new research interest. The number of research publications on mindfulness has increased exponentially in recent years, from 52 articles in 2003 to 549 in 2013 (Black, 2014). Currently the National Institutes of Health is funding 81 studies on mindfulness, representing a total investment of \$100.2 million (Harrington, 2014).

Despite growing interest in business, government, and academia, mindfulness has received comparably little attention from the industrial-organizational (I-O) community. For example, only two articles on mindfulness (by the same author, U. R. Hülshager) have appeared in the *Journal of Applied Psychology* (Hülshager, Alberts, Feinholdt, & Lang, 2013; Hülshager et al., 2014). Considering a growing body of literature indicates that mindfulness offers a wide range of potential benefits at work, this is unfortunate.

Our goal for this article is to provide I-O researchers and practitioners with an overview of what mindfulness is, where the concept came from, and how it has been utilized and studied to date in various clinical and organizational settings. Specifically, in this article we will

- discuss the origins of mindfulness, trace its evolution, and describe how has been defined and conceptualized;
- review research to date, highlighting the antecedents, correlates, and consequences of mindfulness;
- show how mindfulness can benefit employees and organizations;
- discuss mindfulness interventions and how they can be utilized within organizations; and
- propose new directions for researchers and practitioners.

Our hope is that after reading this focal article and the response articles it generates, members of our I-O community will have a more comprehensive understanding of what we know—and what we still need to learn—about mindfulness at work.

The Emergence of Mindfulness in the Workplace

Mindfulness as it is currently practiced and taught in secular Western culture is closely related to traditional Buddhist mind training methods. In Buddhist practice, mindfulness is the act of seeing things as they truly are in the present moment (Gunaratana, 2011). Although we may think that we naturally experience our surroundings as they are, this is rarely the case. Most of the time our perception is limited by our attention span; fragmented by continuous distractions; distorted by our biases, assumptions, and expectations; and regularly hijacked by our emotional reactivity. Mindfulness is the capacity to perceive our world clearly, without adulteration or manipulation. Yet the Buddhist conceptualization of mindfulness is not simply an attentional process. It also has an attitudinal component, whereby mindfulness is imbued with an attitude of open-minded curiosity and an intention of kindness and compassion (Gunaratana, 2011).

Buddhist practice holds that a clear, stable, and focused mind is an essential requirement for effective mental training and purification, which will eventually lead to the cessation of the suffering caused by ignorance and self-delusion (Bodhi, 1994). However, it is worth noting that Buddhism is not the only religion that promotes contemplative practices. Meditative practices predate Buddhism by perhaps thousands of years, and they were well established in northern India at the time of the Buddha, around 400 BCE (Lopez, 2001). Many spiritual traditions include a variety of contemplative practices to aid in spiritual development. For example, in the Christian tradition, contemplative prayer has been practiced and taught for centuries, starting with the desert fathers and mothers of Egypt and continuing through the Middle Ages to modern times. Various contemplative practices also exist in both Islam and Hinduism. In fact, most religions have practices involving stillness, movement, chanting or singing, and visualization (Center for Contemplative Mind in Society website; Plante, 2010).

Secular mindfulness training is a relatively recent development. The current boom in the research and practice of secular mindfulness can be traced back to the work of Jon Kabat-Zinn (see Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985). Kabat-Zinn was a postdoctoral medical student at the University of Massachusetts Medical School and a longtime meditator who had personally experienced the benefits of mindfulness practices. It was during a meditation retreat that he came upon the idea to develop a program

that makes the benefits of mindfulness practice accessible to a broader, non-Buddhist audience (Kabat-Zinn, 2011).

Kabat-Zinn developed a program at the University of Massachusetts Medical School designed to benefit the hospital's most challenged patients: those who suffered from chronic pain and illness, to whom the hospital's medical staff had little to offer. The program that Kabat-Zinn and his colleagues developed and refined became known as Mindfulness Based Stress Reduction, or MBSR. Over the last 35 years, MBSR has been successful in helping participants see significant reductions in pain, stress, anxiety, and other symptoms and conditions. Since then, over 600 people have been trained to teach MBSR globally, and over 20,000 people have taken the program at the UMass Center for Mindfulness alone (<http://www.umassmed.edu/cfm/stress-reduction/>). MBSR is an 8-week program that meets once a week for 2.5 hours, with an additional full-day class between the sixth and seventh weekly classes. In addition, there is the expectation that participants spend about 45 minutes a day in mindfulness practice. The success of MBSR led to the development of a number of clinically oriented mindfulness-based programs and approaches including Mindfulness Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), Dialectical Behavior Therapy (Linehan, 1993), and Acceptance and Commitment Therapy (Hayes, 2012), all of which have research supporting their effectiveness. Since then, a number of mindfulness-based programs and protocols have also been developed to address specific conditions including substance abuse (Bowen, Chawla, & Marlatt, 2011) and eating disorders (Kristeller, 2003).

Mindfulness Training in the Workplace

Until recently, mindfulness training in the workplace consisted mostly of lightly customized MBSR programs. In the last decade, however, workplace training has emerged as a separate field from the broader field of MBSR-based secular mindfulness training. Today, several larger organizations and numerous smaller firms specialize in offering workplace mindfulness training, including Appropriate Response, the Institute for Mindful Leadership, The Potential Project, and the Search Inside Yourself Leadership Institute.

The format and content of workplace mindfulness programs has been adapted from the MBSR model to be more conducive to the workplace. For example, courses have been designed so that employees take less time away from their work tasks. Individual classes are generally shorter than the MBSR standard of 2.5 hours, often lasting 60 to 90 minutes. Expectations for daily practice are also reduced from the MBSR standard of 45 minutes to 10 to 15 minutes. There is a broad range in the length of courses, ranging from

5 to 12 weeks, although another approach to make courses more accessible is to offer them as one-time, multiday retreats. This is especially helpful in gaining the participation of senior executives. In addition, mindfulness programs are now also accessible online, both in real time and asynchronously, enabling employees to save on travel time by participating directly from their desks.

Initial research has suggested that both shortened and online programs are associated with positive work-related benefits (see Klatt, Buckworth, & Malarkey, 2008; Wolever et al., 2012). However, it is worth noting that concerns have also arisen regarding such abbreviated programs. Specifically, as Langer and Moldoveanu (2000) noted, mindfulness is intended to be a process—by its very nature requiring time and patience—so if shortened interventions water down that key component of mindfulness and paint the picture of a “quick fix,” the message may be lost, and participants may not reap all of the potential benefits. As mindfulness research and workplace application move forward, it is crucial that these concerns be balanced against the legitimate need for more time-sensitive, accessible, and cost-efficient interventions.

Researching Mindfulness: Definitions and Theoretical Underpinnings

As the practice of mindfulness has become more popular in recent decades, research on mindfulness has increased exponentially. But scholars have faced challenges translating the concept into a clearly operationalized construct. For example, mindfulness has been defined various ways by teachers, practitioners, and researchers. Thich Nhat Hanh (1976), a widely read Buddhist monk, defines mindfulness as “keeping one’s consciousness alive to the present reality” (p. 11). MBSR founder Jon Kabat-Zinn (2005) defines mindfulness as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (p. 4). Cognitive psychologist Elainor Rosch (2007) states that mindfulness is “a simple mental factor that can be present or absent in a moment of consciousness. It means to adhere, in that moment, to the object of consciousness with a clear mental focus” (p. 259). Considering the wide range of definitions, Grossman (2008) noted that “mindfulness is a difficult concept to define, let alone operationalize” (p. 405).

Although definitions vary, most conceptualizations of mindfulness have three common elements. First, mindfulness is present-focused consciousness (Dane, 2011). At the core of most definitions of mindfulness is a focus on the “here and now” (Herndon, 2008, p. 32), which requires “giving full attention to the present” (Thondup, 1996, p. 48). If you are ruminating about the past or focused on the future, you are not exhibiting mindfulness (Brown & Ryan, 2003). Second, mindfulness involves paying close attention to both internal and external phenomena (Brown & Ryan,

2003; Dane, 2011; Glomb et al., 2012). These include internal stimuli, such as thoughts, feelings, and bodily sensations, as well as external stimuli, including sights, sounds, smells, and events, occurring in one's physical and social environment (Glomb et al., 2012; Kabat-Zinn, 2005). Third, mindfulness involves paying attention to stimuli in an open and accepting way, "without imposing judgments, memories, or other self-relevant cognitive manipulations on them" (Glomb et al., 2012, p. 119). Brown, Ryan, and Creswell's (2007) definition of mindfulness—one of the definitions most commonly cited by researchers and academics—captures these three elements. They state that mindfulness is "a receptive attention to and awareness of present moment events and experiences" (p. 212).

Most scholars have defined mindfulness as an individual, state-level variable that enhances cognitive, psychological, and physiological functioning in various ways. The most commonly cited benefit is self-regulation (Glomb et al., 2012): Mindfulness prevents an individual from thinking or behaving in mechanical or mindless ways by disrupting the automaticity of mental processes (Chaiken, 1980). Mindfulness allows an individual to disengage from automatic thought patterns, engrained brain states, emotional filters, and cognitive schemas and "experience what *is* instead of a commentary or story about what is" (Shapiro, Carlson, Astin, & Freedman, 2006, p. 379, italics in original). Bond, Hayes, and Barnes-Holmes (2006) argue that in a state of mindfulness, one has more psychological flexibility (Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004) and can make choices that are influenced more by personal values and goals than by private fears or environmental demands.

Based on a growing body of research showing that some individuals are more mindful than are others, mindfulness has also been described as a dispositional or trait-like quality (Baer & Lykins, 2011). Studies have found that dispositional mindfulness is positively related to a number of other beneficial individual difference variables, including emotional intelligence, self-compassion, openness to experience, and psychological well-being (see Brown et al., 2007, for a review). In addition, mindfulness has also been described as a set of skills that can be learned through practices like meditation and therapeutic interventions like acceptance and commitment therapy (Hayes, Strosahl, & Wilson, 1999), dialectic behavior therapy (Linehan, 1993), MBCT (Segal et al., 2002), and MBSR (Kabat-Zinn, 1982, 1990). As discussed in the following section, these practices and therapies have been shown to produce a number of benefits.

Before concluding this review of the conceptual foundations of mindfulness, it is important to consider one additional line of research. Throughout this section, we have focused on definitions of mindfulness that emphasize an open, receptive quality of mind that is free from judgment and

analysis. It is important to note, however, that an alternative definition has been posited by Langer (1989b), who defined mindfulness as an “active information processing” mode (p. 138). Although there are some similarities between Langer’s conceptualization of mindfulness and those described earlier, there are a number of fundamental differences. For example, Langer emphasizes that mindfulness requires categorizing, judging, and problem solving, activities that are inconsistent with concepts like acceptance and non-judging. Aware of such differences, Langer (1989a) cautioned against making comparisons between her conceptualization of mindfulness and those influenced by Buddhist thinking. With that in mind, her line of research and approach to mindfulness will not be discussed in the rest of this article. (For a discussion of the similarities and distinctions between these two approaches to mindfulness, see Brown & Ryan, 2003; Brown et al., 2007; Langer 1989a; Langer & Moldoveanu, 2002).

Research Methods

Various research methodologies have been used in the study of mindfulness, ranging from survey designs to experimental studies, cross-sectional as well as longitudinal. In survey and experimental research, two of the most popular psychometric measures of mindfulness are the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001) and the Mindfulness Attention and Awareness Scale (MAAS; Brown & Ryan, 2003). The FMI has both a long form (30 items) and a short form (14 items), and the FMI is able to discriminate between experienced meditators versus others, although Belzer et al. (2013) suggested that it might be improved for use in the meditation-naïve samples. Both forms of the FMI have consistently been found to be psychometrically sound. The MAAS has 15 items, and it too has been found to be psychometrically sound and to successfully distinguish those with various levels of experience with mindfulness. However, it has been criticized (Walach, Buchheld, Büttenmüller, Kleinknecht, & Schmidt, 2006) for placing too much focus on the attention and awareness aspects of mindfulness to the exclusion of other components (e.g., acceptance, present focus, nonjudgmental state). Other mindfulness surveys have included the Toronto Mindfulness Scale (Lau et al., 2006) and the Kentucky Inventory of Mindfulness Scale (Baer, Smith, & Allen, 2004), although neither has seen the relative popularity that the FMI and MAAS have enjoyed.

However, surveying is not the sole methodology that has been employed in mindfulness research. Hülshager and colleagues (2013) conducted a two-study research design, in the first phase using the MAAS and other relevant surveys (e.g., job satisfaction, emotional exhaustion) in collaboration with a 5-day diary study methodology during which 219 employees

completed surveys at two time points each day (immediately at the end of the work day and prior to retiring to bed at night). Hülshager et al.'s second phase was an experimental study in which participants were randomly assigned to a control group or to a self-training mindfulness (MBSR) program that spanned 2 weeks (10 work days). Zeidan, Johnson, Diamond, David, and Goolkasian (2010), however, used a slightly different methodology, utilizing a quasi-experimental design to examine the efficacy of meditation training in university students. Finally and perhaps most rigorously, Jensen Vangkilde, Frokjaer, and Hasselbalch (2012) used a blinded experimental design in which they assigned meditation novices to a mindfulness (MBSR) group, a nonmindfulness stress reduction group, or a control group, with the latter group further split into nonincentivized and incentivized groups to manipulate attentional performance. In addition to self-report scales, Jensen et al. (2012) also used saliva cortisol samples as a physiological indicator of stress. Arguably the most physiologically sophisticated methodology for studying mindfulness is the usage of functional magnetic resonance imaging (fMRI) to investigate how mindfulness can alter brain functioning. Such techniques have been used in a variety of studies to be discussed later, including Farb et al. (2010); Modinos, Ormel, and Aleman (2010); and Kilpatrick et al. (2011).

As previously mentioned, a majority of mindfulness studies involve some type of training or intervention. Although a wide variety of mindfulness interventions have been attempted, the two most popular are MBCT (Segal et al., 2002) and MBSR (Kabat-Zinn, 1982). Segal and colleagues' (2002) MBCT trainings utilize well-supported cognitive behavioral therapy techniques typically with the primary intention of positively impacting a patient who may suffer from depression. With this in mind, MBCT works from the premise that many individuals at risk for depression tend to think themselves into a negative spiral of thoughts, ruminating in a way that can prompt a depressive episode. The focus of MBCT, then, is to prevent or interrupt this potential spiral by encouraging the individual to focus on the moment in a nonjudgmental way and to let it pass without further thought or concern (Felder, Dimidjian, & Segal, 2012).

Kabat-Zinn's (1982) 8-week-long MBSR training program was developed by Kabat-Zinn and his colleagues at the University of Massachusetts' Stress Reduction Clinic. Much research has been conducted on this particular mindfulness program, and it has consistently been shown to be effective as initially developed as well as several variants of it (Chaskalson, 2011). It involves training participants in several mindfulness practices. One foundational practice involves cultivating a focused attention on the sensations of one's breathing while allowing thoughts, emotions, and physical sensations to come into awareness and then pass away. The goal is not to ignore

thoughts or events but instead to let them come, accept them as they are, and let them pass without analyzing, judging, or ruminating on them. This practice cultivates the capacity of participants to become more fully aware of everyday events as well as their reactions to them without becoming overly attached to, identified with, or plagued by them. MBSR has been utilized in full (8-week) form (e.g., Brown & Ryan, 2003; McCraty, 2003) as well as in shortened installments (e.g., Farb et al., 2010).

Although MBCT and MBSR differ slightly in focus, both are clinically oriented programs typically hosted in group sessions wherein mindfulness skills are taught over an (ideally) extended period of time, typically 8 weeks, and students are requested to meditate for approximately 45 minutes per day. In both MBCT and MBSR, the three most fundamental exercises are the sitting meditation, hatha yoga postures, and the body scan. As described by Jensen and colleagues (2012), the body scan requires practitioners to close their eyes, preferably while lying down, and to carefully and progressively focus on each area of the body, noticing any sensations that are present from moment to moment from a nonjudgmental viewpoint.

The practices utilized by MBCT and MBSR can also be practiced during intensive training retreats, during which they may be practiced for 10 hours or more each day (Forte, Brown, & Dysart, 1987). However, researchers have also been exploring the efficacy of brief mindfulness trainings. For example, Zeidan and colleagues (2010) demonstrated the efficacy of an intervention that exposed participants to mindfulness training for 20 minutes per day over a period of 4 days. In addition, Hafenbrack, Kinias, and Barsade (2014) demonstrated that a single 15-minute mindfulness intervention has a significant effect on participants' problem-solving skills. However, Jha and colleagues' (2010) findings expressed some concern in this regard, indicating that mindfulness training time may affect its efficacy, with longer training programs yielding more successful and sustainable results than shorter trainings.

Related to this is the concern that, due to realistic application concerns within the workplace and its strict time limitations, some mindfulness training programs enacted within organizations may not be optimally efficacious. That is, as mindfulness training programs are increasingly adopted within organizational environments, it is likely that the empirically supported training programs will be severely curtailed in order to meet the time constraints of organizations. A similar concern is that the increasing popularity of such trainings may increase the possibility that untrained or inexperienced consultants or organizational personnel will attempt to lead mindfulness trainings. Without properly trained facilitators, such trainings are unlikely to yield the same level of effectiveness on important individual and organizational outcomes (Chaskalson, 2011).

Effects of Mindfulness

The effects of mindfulness have been shown to be enduring and wide reaching. Mindfulness training programs have evidenced sustained enhancement in a variety of domains, including physical, psychological, cognitive, and conative realms.

The health benefits of mindfulness are often thought to be primarily limited to stress reduction. Although mindfulness practice has in fact been shown to reduce high stress levels (Wolever et al., 2012), which themselves have been shown to be associated with compromised sleep and increased health risks, the physical health benefits of mindfulness meditation are far more wide reaching (Williams, 2006). For instance, decreased blood pressure (both systolic and diastolic) has been found to be associated with mindfulness practice in a variety of experimental, controlled studies, including those specifically examining participants with hypertension (McCraty, 2003) and self-reported high stress levels (Nyklíček, Mommersteeg, Van Beugen, Ramakers, & Van Boxtel, 2013). High-stress participants have also been found to benefit from mindfulness meditation to the extent that it can improve not only their blood pressure but also their breathing rate and heart rhythm as compared with a control group (Wolever et al., 2012).

Davidson and colleagues (2003) further found that mindfulness meditation practices both improved energy levels and enhanced the immune systems of employees in high-stress jobs. Malarkey and colleagues (Malarkey, Jarjoura, & Klatt, 2013) recently found that mindfulness practice can also lead to decreased c-reactive protein levels (associated with inflammation) among obese individuals, and they further suggested that the effect may be even stronger among nonobese participants. Finally, in a review, Chiesa and Serretti (2010) noted a variety of other physical benefits that have been shown to result from mindfulness meditation practice, including decreased chronic pain and a reduction of symptoms of rheumatoid arthritis, multiple sclerosis, fibromyalgia, psoriasis, and even HIV.

But benefits are not limited to the physical realm. A substantial proportion of the most frequently supported benefits of mindfulness meditation are psychological and affective in nature. On a broad level, mindfulness practice has been repeatedly evidenced to decrease global psychological distress (McCraty, 2003; Williams, 2006) and improve overall mental health (Chu, 2010). In fact, perhaps the most commonly cited psychological benefit of mindfulness practice is reduced stress. Such a finding has been consistent across job types, mindfulness trainings, and employee stress levels (e.g., Chu, 2010; Davidson et al., 2003; Foureur, Besley, Burton, Yu, & Crisp, 2013; Galantino, Baime, Maguire, Szapary, & Farrar, 2005; McCraty, 2003; Roeser et al., 2013). Mindfulness practice has also been linked with decreased anxiety (Davidson et al., 2003; Orzech, Shapiro, Brown, & McKay, 2009; Roeser et al., 2013), as

well as decreased instances of depressive symptoms (Farb et al., 2010; McCraty, 2003; Roeser et al., 2013). In fact, Kuyken and colleagues (2008) found that an 8-week MBCT program was more effective at reducing long-term depression than were antidepressant drugs.

The psychological benefits of mindfulness meditation can also be seen in less extreme instances. Even for individuals without clinical depression, mindfulness practice has been consistently shown to improve mood and affect. For instance, Davidson and colleagues (2003) found increased mood and happiness among employees in a high-stress job who completed a mindfulness meditation program. These findings were echoed in a study by Galantino and colleagues (2005) among healthcare professionals. Orzech and colleagues (2009) similarly found enhanced subjective well-being among participants in a month-long mindfulness training program, and McCraty (2003) found that participants reported an overall increase in emotional health and a more positive outlook on life after only a brief mindfulness intervention.

Three other studies went a step further, offering three more specific and distinct operationalizations of mindfulness's impact on emotion/mood. Williams (2006) found that mindfulness practice led to positive attitudinal change as well as positive modifications in resulting behaviors, in addition to a decrease in the extent to which the negative impact of daily hassles affected the mindfulness-trained individuals. Notably, these positive shifts were even more evident at the 3-month follow-up period than they were immediately after the mindfulness training. More recently, some researchers have taken the methodology to a more scientific level, using fMRI technology to further tease out mindfulness's impact on emotion. Using this technique, Modinos and colleagues (2010) found that mindfulness meditation affected participants' reappraisal of emotional stimuli, whereby it decreased the extent to which they experienced negative emotional responses. Similarly, Farb and colleagues (2010) found that individuals who participated in an 8-week mindfulness training program reacted differently (as seen on fMRI) to sadness provocation versus a control group, such that the mindfulness-trained group were not as negatively affected by negative-emotion-inducing stimuli, thereby further confirming Modinos and colleagues' findings.

Other benefits of mindfulness training have been identified. For instance, as compared with control groups, mindfulness trainings have been shown to reduce the extent to which employees experience emotional exhaustion in their jobs (Hülshager et al., 2013), particularly when those jobs are in known high-stress fields (Galantino et al., 2005). Other research (Chu, 2010) has found that increased mindfulness meditation experience is associated with higher levels of emotional intelligence, the four components of which are self-awareness, self-management, social awareness, and

relationship management. Baer (2003) likewise found that mindfulness meditation might improve one's relationships with others as a result of reduced reactivity. Interestingly, although not surprisingly, it appears that such emotional and caring characteristics are also extended not only to others but also to the self, as Orzech and colleagues (2009) found that intensive mindfulness training was associated with enhanced self-compassion from pretraining to the 1-month follow-up period.

Such psychological benefits of mindfulness have cognitive roots, and research has consistently found that mindfulness meditation practice significantly and positively impacts brain activity as well as the density of neural gray matter in the dorsal portions of the prefrontal cortex, the area of the brain responsible for key functional capabilities such as learning, memory, affective processing, emotion regulation, perspective taking, and facilitating adaptive responses to stress (Davidson et al., 2003; Hölzel et al., 2011; Modinos et al., 2010). Jha, Krompinger, and Baime (2007) also found that such meditation increases activity in the anterior cingulate cortex region of the brain, an area responsible for self-regulation of attention.

Indeed, substantial research has supported Jha et al.'s (2007) finding that meditation resulted in significantly increased attention and awareness in a meditation group as compared with a control group. Specifically, Jha et al. (2007) found that attention-related behavioral responses such as spatial orienting and spatial navigation abilities were improved, as was the ability to be selectively attentive, a skill necessary in spatial navigation in order to avoid becoming disoriented or lost. Chambers, Lo, and Allen (2008) similarly found significant improvements in working memory performance and sustained attention in participants in an intensive 10-day mindfulness meditation retreat as compared with individuals in a control group. More recently, Kilpatrick et al. (2011) used fMRI methodology in finding that 8 weeks of MBSR training is associated with a more consistent attentional focus, enhanced reflective awareness of sensory experience, and improved sensory processing. Zeidan et al. (2010) similarly found that even brief mindfulness training improved participants' visual-spatial processing and their performance on cognitive tasks necessitating sustained attention.

Zeidan et al. (2010) also found that such trainings could also improve participants' overall executive functioning, including positive effects on the performance of cognitive tasks requiring executive processing efficiency, as well as positively impacting participants' working memory capacity. Such a finding has been repeatedly evidenced by multiple studies, including that of Jha et al. (2010), which in addition to their aforementioned findings also found that working memory capacity increased for the experimental groups that received mindfulness training. Roeser et al. (2013) similarly found that a 36-hour mindfulness training program disbursed over 8 weeks increased

focused attention and working memory capacity in a sample of teachers. Anicha, Ode, Moeller, and Robinson (2012) also echoed these findings, indicating that mindfulness practice was positively associated with enhanced perceptual abilities in working memory and cognitive control flexibility.

As may be deduced from mindfulness's impact on cognitive functioning, substantial recent research has also suggested that mindfulness practice should also be viewed as something that can readily contribute to business success. Teper and Inzlicht (2014) suggest that mindfulness practice affects how one reacts to constructive criticism or feedback, such that people may be more attuned to evaluating and accepting the feedback with less concern for enacting self-protective psychological mechanisms that may erroneously reject negative feedback or focus too much on positive feedback, and in the process also rejecting recommendations for improvement. This decreased emotional reactivity also transfers into the protection that mindfulness offers against fleeting emotional highs that may lead to rapid or impulsive decision making in business dealings. Fiol and O'Connor (2003) suggest that mindfulness practice may lead to better decision making such that individuals practicing mindfulness will be more likely to (a) understand the value of information for current circumstances and (b) interpret unexpected results as relevant rather than dismiss them, even when they do not fall in line with current or past (familiar) practices or findings. As such, mindful employees may be more readily able to look past the temptation of the status quo and/or immediate rewards in favor of the long-term picture, a characteristic key to enduring success and growth. This is further supported by Hayes (2004), who found that mindfulness practice led to increased psychological flexibility; Shapiro et al. (2006), who found that mindfulness practice led to an improved ability to perceive events objectively; and Hafenbrack et al. (2014), who found that even a single period of mindfulness practice improved the ability to resist cognitive bias.

Moreover, Chaskalson (2011) further suggested that mindfulness is also likely to positively impact a variety of other notable workplace outcomes, including creativity, innovation, resilience, work engagement, productivity, communication skills, reduced conflict, absenteeism, and turnover. Many of Chaskalson's suggestions have been empirically supported. For instance, Howell and Buro (2011) found that mindfulness practice is predictive of achievement as mediated by enhanced achievement-related self-regulatory abilities. Levy and colleagues (Levy et al., 2012) further found that mindfulness meditation enhanced task endurance and dedication and decreased multitasking as compared with both a general relaxation group as well as a control group. In addition, they found that participants in the former group reported less negative task-related emotions than did participants in the latter two groups. Seligman (2006) conducted a study with a large insurance

company, finding that employees practicing mindfulness had better sales performance than did those who did not practice. Interestingly, Seligman noted that the worst performing employees were those who were pessimistic. He further suggested that humans have a natural tendency to be pessimistic, although this can be altered through mindfulness training that discourages ruminative thinking.

Furthermore, beyond the performance-relevant outcomes as discussed above, mindfulness practice can also have job-relevant outcomes that are of particular import to the employees themselves. For instance, Hülshager et al. (2013) found that mindfulness practice promotes job satisfaction and aids in the prevention of burnout from emotional exhaustion, a finding echoed by others (Krasner et al., 2009; Oman, Richards, Hedberg, & Thoresen, 2008; Roeser et al., 2013). Others have further found that mindfulness training impacts empathy for others (clients, patients) as well as for oneself (occupational self-compassion; Roeser et al., 2013), in addition to enhancing both patient-centered care and caregiving self-efficacy among health care professionals in particular (Allen, Bromley, Kuyken, & Sonnenberg, 2009; Krasner et al., 2009; Oman et al., 2008). Such enhanced emotional self-awareness resulting from mindfulness (Creswell, Way, Eisenberger, & Lieberman, 2007) is particularly notable in regard to the workplace. Specifically, McCall, Lombardo, and Morrison (1988) noted that lack of emotional self-control has been suggested as being a key obstacle toward leadership success, thereby making mindfulness practice even more relevant in relation to workplace—and specifically leadership—achievement and success.

Mindfulness Applications for Organizational Effectiveness

Considering these findings, there are many compelling reasons to consider implementing mindfulness programs in the workplace. Here we highlight four.

Managing Employee Stress

The prevalence of chronic stress in our culture makes it a serious public health issue. Sixty-seven percent of Americans report experiencing emotional symptoms of stress, and 72% report experiencing physical symptoms (American Psychological Association, 2014). Over the last 30 years, self-reported levels of stress have increased 18% for women and 25% for men (Cohen & Janicki-Deverts, 2012).

Managing stress in the workplace is a similarly serious issue. Forty percent of workers report that their jobs are “very or extremely stressful,” and 26% of workers say that they are “often or very often stressed at work” (National Institute for Occupational Safety and Health, 1999). Reducing stress is not only a benefit to individuals, it also has a significant impact

on organizational effectiveness. It is estimated that workplace stress costs American business up to \$150 billion a year (Sauter, Murphy, & Hurrell, 1990). These costs come in the form of increased health care costs, increased absences, and decreased productivity and performance.

The effects of mindfulness training on employee health and wellness have been well documented. Most prominent among them is a significant decrease in experienced stress levels. In fact, many of the other health benefits resulting from mindfulness training either may be the direct result of, or may be significantly enhanced by, decreased stress. For organizations looking to reduce workforce stress and build resilience, mindfulness training may help.

Improving High Potential Development

The development of future leaders is a top concern for business. U.S. organizations spent an estimated \$24 billion on leadership development in 2013 (Bersin, 2014), which constitutes 35% of the total training spend. Yet the results of this expenditure have been less than satisfactory, with 75% of CEOs citing leadership development as a top concern and only 15% expressing satisfaction with their high potential practices (Corporate Leadership Council, 2005). In fact, it is estimated that 40% of high potential promotions end in failure.

What can mindfulness training do to enhance high potential development? The single biggest factor in derailment is a lack of self-awareness (Hogan, Hogan, & Kaiser, 2010). According to McCall (1998) and others, high potential leaders accumulate a track record of success, which may lead them to become overconfident in their own abilities and less open to others' feedback. Awareness of self and others is an inherent element of mindfulness, so an increase in mindfulness will correspond to an increase in self-awareness. Therefore, it stands to reason that mindfulness training could have a significant impact on the success of high potential employees and the effectiveness of organizational high potential processes (see Lee, 2012).

Enhancing Engagement, Reducing Burnout

Engagement is defined as the extent to which employees are intellectually, emotionally, and behaviorally invested in their jobs (Kahn, 1990). Employee engagement has been linked to greater employee satisfaction, lower turnover intention, and an increase in organizational citizenship behaviors (Saks, 2006). Mindfulness has been linked to both decreased emotional exhaustion (Hülshager et al., 2013) and increased employee engagement (Leroy, Anseel, Dimitrova, & Sels, 2013). Dane and Brummel (2014) also found that mindfulness was related to both increased performance and decreased turnover intention. In addition, a review of 10 studies on MBSR training for health

care professionals found consistent evidence of decreases in emotional exhaustion and symptoms of burnout and increases in mood, positive affect, and satisfaction (Irving, Dobkin, & Park, 2009). By implementing mindfulness programs, organizations may be able to increase employee engagement and commitment, especially for high-stress and high-burnout jobs.

Helping Employees Cope With Organizational Change

With organizational change becoming increasingly common in today's workplace, it is notable that a growing body of research shows that change efforts often fail because of employee resistance (Beer, Eisenstat, & Spector, 1990; Burke & Biggart, 1997; Porras & Roberston, 1983). Based on various findings, mindfulness may help employees cope with organizational change in various ways. For example, Bond and Bunce (2003) found that employees with higher levels of acceptance—a key component of mindfulness—had higher levels of job control at work. Mindfulness could reduce the stress associated with the loss of job control that often happens during organizational change. In addition, Brown, Ryan, Creswell, and Niemiec (2008) found that higher levels of mindfulness are associated with lower levels of ego-defensive reactivity under threat. This suggests that mindful employees may be less self-focused and reactive during a change effort. Researchers have also noted that mindfulness encourages objectivity—the quality of seeking to possess the “full facts” in a manner similar to an objective scientist seeking accurate information (Brown et al., 2007; Rahula, 1974; Smith & Novak, 2004). Such a stance toward reality encourages a deferral of judgment until a careful examination of facts has been made (Nyaniponika, 1973). This way of evaluating events may offer numerous benefits during times of change. Flexible, objective, mindful employees may be more open to new ways of doing things and may be more observant and attentive while learning new behaviors. They may also be more accurate and objective, rather than reactive or pessimistic, in assessing the potential benefits of organizational change efforts.

Mindfulness Training in Organizations

For practitioners seeking to implement a mindfulness program in their organization, a number of options exist. Mindfulness training for workplace audiences can take many forms. One way is delivery of the MBSR program itself in the workplace. MBSR consists of three elements. However, as discussed earlier, the time demands of this program make it impractical for delivery in organizations. Therefore, mindfulness training for workplace applications has been adapted in several ways. First, weekly classes are generally shorter, lasting anywhere from 1 to 2 hours. Second, expectations for daily mindfulness practice are also shorter, ranging from 10 to 20 minutes daily. Other adaptations to workplace audiences include offering training as

a one-shot offsite event. This has been used effectively with senior leadership audiences by the Institute of Mindful Leadership and for general audiences by the Search Inside Yourself Leadership Institute. Mindfulness training is also available online through both prerecorded courses and live virtual classrooms, such as the programs offered by eMindful.

All of these programs described above have data supporting their effectiveness, including peer-reviewed studies. Yet as mindfulness training suppliers and modalities continue to multiply, it will become increasingly important for practitioners to evaluate the efficacy of any mindfulness training program before deploying it organizationally.

Current Questions and New Directions

Mindfulness is clearly a promising new construct. Given the mounting evidence highlighting the numerous benefits of mindfulness, more coaches, practitioners, and researchers are looking for ways to incorporate mindfulness into their interventions, experiments, and field studies. Nevertheless, a number of practical, empirical, and ethical concerns remain. Here we highlight four questions that have emerged and deserve further attention.

How Can We Best Conceptualize and Measure Mindfulness?

As noted earlier, mindfulness has been defined a number of different ways by researchers, clinicians, and practitioners. It has been conceptualized as a trait, a state, and a learnable skill and has been measured using instruments that focus on everything from mindlessness (e.g., Brown & Ryan, 2003) to flexibility (e.g., Bodner & Langer, 2001). Although some may argue that there are more similarities than differences across the current definitions and measures of mindfulness, even small differences can lead to construct validity concerns. For example, in a quasi-experiment with meditation practitioners, Brown, Kasser, Ryan, Alex Linley, and Orzech (2009) used both the FMI and the MAAS to measure mindfulness and its relationship with financial desire discrepancy, a correlate of subjective well-being. They found that only the FMI predicted a reduction in financial desire discrepancy.

In light of such findings, researchers should evaluate, both qualitatively and quantitatively, the content, structure, and psychometric properties of the various mindfulness measures that currently exist, with the hopes of identifying or developing one primary instrument. In addition, more research should be conducted to explore and extend mindfulness's nomological network, identifying additional antecedents, correlates, and consequences that are associated with the construct. Doing so would not only facilitate individual studies on mindfulness and its effects but would also allow for an eventual meta-analysis on the construct and its relationships, a valuable endeavor that would be unrealistic with the current inconsistent operationalizations

of mindfulness but that could shed substantial light on the construct and its utility in the workplace.

How Does Mindfulness in the Workplace Impact Employee Behavior and Performance?

Although a number of studies have investigated the general benefits of mindfulness for individual health, well-being, and emotional balance (see above), fewer have explored the specific performance results that mindfulness produces in a workplace setting. Based on the few studies that have been conducted, there is good reason to believe that mindful employees are more engaged, productive, and effective. For example, Krishnakumar and Robinson (2015) recently found that part-time employees with higher levels of dispositional mindfulness were less Machiavellian, were less prone to hostile feelings in the workplace, and engaged in fewer counterproductive work behaviors. As noted earlier, Dane and Brummel (2014) discovered a positive relationship between workplace mindfulness and job performance among restaurant servers working in a fast-paced service environment. Similarly, Reb, Narayanan, and Chaturvedi (2012) found that mindful supervisors had a positive impact on their employees' well-being and performance. Finally, Bond and Bunce (2003) found that employees' willingness to accept their thoughts and emotions predicted better mental health and work performance a year later. The results to date are promising, but more research is needed to explore the impact of mindfulness on a wide range of workplace outcomes, including creativity, innovation, teamwork, learning, reactions to change, turnover, and performance.

It is also worth noting that despite these initial promising results, some researchers recently expressed concerns that mindfulness training may actually yield unintended results for the organization that do not actually fall in line with organizational goals. Specifically, Glomb et al. (2012) noted that mindfulness training might decrease the automaticity with which employees do their work. Although this is beneficial in some situations requiring increased conscientiousness (e.g., high-risk decisions), in more mundane work tasks it may have the result of slowing down employee production. Ericson, Kjonstad, and Barstad (2014) issued a similar caution, suggesting that as mindfulness encourages employees to act in line with their values and interests, they may elicit behaviors that are not in the best interest of organizational performance. For instance, mindfulness may help employees realize that they should not overburden themselves with extra work duties, should have a more relaxed approach to work, and/or should spend more time with their family as opposed to their work responsibilities. Therefore, it is possible that mindfulness may not facilitate bottom-line organizational performance in the short term. Overall, as Dane and Brummel (2014) noted,

it is also important to understand the impact that mindfulness has on employees working in variety of work environments, industries, and settings. By determining the boundary conditions of this new construct, researchers and practitioners will have a better understanding of when and how mindfulness can enhance performance at work versus when it may not.

Is Mindfulness Good for Everyone?

As noted above, mindfulness has been shown to produce a number of psychological, physiological, and performance-related benefits. However, it is not known whether mindfulness benefits some people more than others—that is, whether individual difference variables impact the efficacy of mindfulness interventions. Future studies should seek to understand how mindfulness training interacts with various individual difference variables, including personality traits, dispositions, and mental models. For example, it is conceivable that mindfulness training may benefit people with certain personality profiles (e.g., those with elevated neuroticism or conscientiousness levels) more than others. It is also conceivable that the practice of mindfulness may not benefit certain individuals (in fact, it may even frustrate or upset some). By identifying and exploring possible interactions between mindfulness and other individual difference variables, researchers and practitioners will have a better understanding of when, and with whom, to utilize mindfulness training and interventions.

In a similar vein, it is possible that cultural differences may impact the success of mindfulness programs when implemented internationally or with employees who hail from international backgrounds. Supportive of this consideration is the fact that Christopher et al. (Christopher, Charoensuk, Gilbert, Neary, & Pearce, 2009; Christopher, Christopher, & Charoensuk, 2009) found that Eastern (Thai) and Western (American) conceptualizations of mindfulness may have important differences. The authors suggest that this may be a result of the Buddhist versus secular associations with the construct in each culture, respectively. It is further important to note that this difference has implications for how mindfulness trainees from various cultures and/or countries would react to mindfulness interventions. In today's increasingly globalized workplace, this is an important consideration to take into account prior to designing or implementing a mindfulness training program, particularly in an organization with international offices and/or expatriates working in a culture other than their own.

Is It Appropriate to Introduce Mindfulness Into the Workplace?

In recent years, a small but growing number of mindfulness practitioners and researchers have started questioning the ethics of implementing mindfulness programs in corporate environments. Various concerns have been raised.

For example, some scholars and practitioners lament the secularization and commoditization of a spiritual practice that—in Buddhist tradition—is intended to do more than reduce stress or increase productivity. In a recent *Huffington Post* article, Ron Purser, a professor of Management at San Francisco State University, and David Loy, a Zen teacher, write, “Rather than applying mindfulness as a means to awaken individuals and organizations from the unwholesome roots of greed, ill will and delusion, it is usually being refashioned into a banal, therapeutic, self-help technique that can actually reinforce those roots” (Purser & Loy, 2013). Others have argued that mindfulness programs could be used as a means to pacify disgruntled employees, maintain the status quo, and ultimately manage and manipulate the workforce (see Carette & King, 2004). Although there are clearly a number of potential benefits associated with the practice of mindfulness, I-O researchers and practitioners should consider these concerns and identify and explore any potential negative consequences of implementing mindfulness programs at work.

Conclusion

Through this focal article, we have attempted to raise awareness about a promising new construct and its potential application in the workplace. Over the past 2 decades, an increasing number of scholars and practitioners have explored various ways that mindfulness can benefit people both at work and in their personal lives. A growing body of research shows that mindfulness can decrease stress, increase mental and physical health and cognitive functioning, and improve performance and well-being. As a result, a number of organizations have started to implement mindfulness programs for their employees. But more work is needed to clarify construct definitions and assessments; explore a broader set of antecedents, consequences, mediators, and moderators; and develop and evaluate the impact of mindfulness interventions and programs in work settings. Our hope is that this article—along with our colleagues’ responses—sparks new interest and ideas about mindfulness at work.

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