8 *Mindfulness and creativity in the workplace*

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Introduction

In the spring of 2010, the technology and consulting organization IBM released a much-publicized opinion study of CEOs. Some 1,500 chief executives from 60 countries and 33 industries suggested that more than integrity, rigor, or even vision, creativity is the single most important leadership competency (Berman and Korsten 2010). Upon reflection, this finding is not entirely counterintuitive as creativity is a key driver of long-term organizational success (Florida, 2002). Far too often, top managers fall into routine and habitual ways of doing business that prevent them from adapting to changing conditions and recognizing new opportunities (Nystrom and Starbuck 1984). Firms such as Polaroid, whose management was wholly unprepared to adapt to the rise of digital photography, richly illustrate this point (Tripsas and Gavetti 2000). As business environments grow increasingly volatile and complex, managers who can navigate ambiguity and respond adaptively to change will be in ever-higher demand.

Yet, despite being of critical importance to firm success, academics and practitioners alike are uncertain how to best facilitate workplace creativity. Existing approaches largely seek to improve creativity either by hiring individuals perceived as particularly talented or by implementing policies and procedures that increase employees' motivation to think creatively. Mindfulness training may represent a third route to creativity. While typically conceptualized as a wellness intervention, mindfulness training was developed by Buddhist monastics to produce a state of mind that "differs profoundly" from "our usual mode of consciousness" (Bodhi 1984, p. 75). This state of mind speaks rather directly to the kind of cognitive flexibility and creative insight required in the modern workplace. As such, I suggest that mindfulness may provide a distinctive intrapsychic path to enhanced workplace creativity. In this chapter, I therefore outline an integrated perspective of creative

cognition in light of mindfulness that I hope will be of benefit to academics and practitioners alike.

What is creativity?

Before we proceed, we must define creativity. Because the term carries so many meanings, the best way to tackle its definition is in regard to its constituent elements. A helpful heuristic is to distinguish between creative *products*, the *people* who originate them, the *places* that facilitate creativity, and the *process* by which it occurs (e.g. Rhodes 1961). In firms, these four Ps of creativity are related in a specific and noteworthy way. For example, creative products are distinguished by their novelty (i.e. distinctness from previous offerings) and usefulness (i.e. value to customers) (Barron 1969; Mumford 2003). Products originate from the interaction between people and place: firms seek to hire the right employees and design the right kind of workplace (see Woodman, Sawyer, and Griffin 1993). Creative people have a unique personality that is alert, non-conformist, flexible, intellectually curious, broad minded, self-confident, risk taking, attracted to complexity, and open to experiences (Barron and Harrington 1981; Martindale 1989; McCrae 1987). Creativity is greatest in those with positive, activating, and approach-oriented moods (Baas, De Dreu, and Nijstad 2008) and may require intelligence as a necessary but insufficient condition (Guilford 1967).

Creative workplaces are distinguished by their ability to generate intrinsic motivation, such that employees are motivated by the work itself instead of by external forces such as financial compensation or competitive pressure (Amabile 1998). As a result, employee creativity is higher given complex and meaningful jobs, supportive and non-controlling supervisors, developmental and nonjudgmental evaluation procedures, and office configurations that limit interruptions to work (Shalley, Zhou, and Oldham 2004). In firms, the creative process is ongoing and iterative. For example, past learning enables individuals and teams within firms to identify problems (i.e. *preparation*); these individuals and teams then attempt several solutions (i.e. *incubation*) until firm resources are marshaled behind a single plausible solution (i.e. *illumination*); consumers in the market then provide feedback about this solution through purchasing decisions (i.e. *verification*), which facilitates further learning and enables new creativity (Hurley and Hult 1998; Wallas 1926). Throughout this chapter, we will refer

back to concepts related to the four Ps of creativity (i.e. product, person, place, process) as a helpful touchpoint to ground our conversations regarding mindfulness and creativity.

Creative cognition

While the above discussion can help us understand what creativity is, it does not explain the cognitive micro-processes that describe how creative insights actually emerge. Essentially, creative insight can come either from a shift in the way that the problem and solution are represented in the mind or in the way that knowledge structures informing possible solutions are organized. There are also certain modes of thinking that make these changes in representations and knowledge structures more likely. These cognitive micro-processes will be important to review before we delve into the potential role of mindfulness in enabling creativity.

Representing problems and solutions

There are three ways that changes in mental representations can lead to insight (Ohlsson 1992). *Elaboration* means adding information to a problem representation. For example, if asked to identify the link between "board" and "table," you may respond that a table is a wooden board. After elaborating the many meanings of "board," however, you may also realize that a company's board meets around a table. Insight came from adding new information to an initially incomplete representation. *Re-encoding* means rejecting part of the problem representation. For instance, suppose you were asked if it was legal for a man to marry his widow's sister. At first, you may consider this a legal question. However, if you rejected the legal interpretation and re-encoded the question, you may realize that a man with a widow is already dead and therefore cannot marry. Insight came from removing unhelpful information from the initial representation.

Constraint relaxation means changing assumptions about the solution representation. For example, if asked to help a company reduce the frequency with which their products break, you may think about better materials or stronger construction. Once in a mindfulness workshop, a participant responded by telling the company to make the product more beautiful. By relaxing the constraint that the solution

must be product-oriented, he arrived at a relationship-oriented solution: users would better care for a product they found beautiful, reducing breakage. Insight came by relaxing constraints on the solution, thereby allowing for unprecedented strategies.

Organizing knowledge structures

However, even assuming that the problem and solution are properly represented, creativity still requires identifying and connecting the pieces of knowledge necessary to solve the problem. If the necessary connections already exist in the mind, one need only recall the solution, which makes the problem one of access to long-term memory. Creative problems, however, require individuals to re-organize their knowledge structures in some way before the solution emerges. This occurs through four processes of increasing complexity (Welling 2007).

Application entails applying an existing knowledge structure to an incrementally novel context. For example, a firm selling customer relationship management software to the insurance industry could apply the same process to sell its software to the banking industry. *Analogy* transfers an existing knowledge structure to an innovative context. In this case, the company could realize that software managing firm–customer relationships could also be used to manage firm–employee relationships. It could thus use the same software in a new way that helps send internal memos and manage paperwork with its employees. *Combination* integrates existing knowledge structures to form a new structure. The firm could thus combine client and employee communication concepts to produce a new combined software system. *Abstraction* creates a new superordinate concept that defines the relationship between lower order knowledge structures. For example, this new interface to manage both client and employee relationships could be seen as part of a new category: integrated workplace relationship solutions. Having this new concept helps make sense of the combination and facilitates the development of similar valuable insights.

Modes of thinking

While changing representations and organizing knowledge structures are important, how exactly do these processes occur? A key distinction

made by Guilford (1959) identified convergent and divergent modes of thinking. In *convergent thinking*, individuals increasingly narrow their mental search processes until they arrive at a single correct answer. For example, if asked to identify the capital of California, your memory search would systematically narrow, perhaps from all cities, to cities in California, to the single capital city of Sacramento. In *divergent thinking*, however, mental processes are relatively unconstrained, and instead produce a variety of correct answers. For example, if asked to list as many cities in California as possible, you will notice that instead of directing your mind narrowly, you simply allow the bottom-up answers to emerge: San Francisco, Los Angeles, Sacramento, and so on. Creativity requires both of these processes: divergent thinking helps one elaborate representations and produce a variety of solutions, while convergent thinking helps one narrow representations and arrive at the best solution.

Creativity training

Given the importance of creativity, several training programs have been established and implemented in workplaces with some degree of success (see Puccio *et al*. 2010 and Scott, Leritz, and Mumford 2004). The earliest program, Creative Problem Solving, was developed by the advertiser Alex Osborn (1953), who is known for pioneering the concept of brainstorming. This process is similar to the typical creative process in that it entails gathering information, recognizing problems, generating solutions, and planning action. Its hallmark, however, is the way in which it alternates between divergent and convergent thinking in each step. Another well-known program is Synectics, which aims to "make the familiar strange and the strange familiar" (Gordon 1961). It challenges individuals to consider their creative problem by drawing upon various types of analogies that probe both related and fantastic solutions and contextualize the problem both personally and symbolically. The Six Thinking Hats program similarly utilizes techniques to help individuals shift perspectives (De Bono 1985). For example, it helps individuals alternate between information gathering, intuitive feeling, logical thinking, optimistic responses, and idea generation modes of problem solving.

The benefit of these aforementioned programs is that they essentially help structure the creative process in ways that mitigate

common pitfalls. For example, the non-evaluative nature of brainstorming in the Creative Problem Solving approach helps avoid self-consciousness in divergent thinking, and the information gathering stage in the Six Thinking Hats program avoids the tendency to solve problems that have not yet been fully elaborated. These training programs thus offer benefits in that they provide heuristics to help individuals understand and participate in the creative process (Scott *et al.* 2004). Other means of facilitating creativity seek to maximize the interaction of people and place (i.e. individual differences and workplace conditions) (Woodman *et al.* 1993). This, however, leaves an important gap: instead of improving creativity by helping employees understand the process or by structuring the workplace, can firms improve creativity by strengthening employees' underlying cognitive abilities? The remainder of this chapter will address this question through mindfulness. It will paint a picture of what mindfulness is, where it came from, and why it might provide a unique intra-psychic method of improving creativity.

Buddhist psychology

Mindfulness is a fundamentally cross-cultural and pre-scientific construct as it emerged several millennia ago from the teachings and practices of Buddhist psychology. At first glance, this original context has little to say directly about creativity. It is significant that the Buddha and his successors "take care to explain their thought not as creation but as a retracing of forgotten eternal truth" and therefore they "compare their activity to the clearing of an overgrown ancient path in the jungle, not to the making of a new path" (Klostermaier 1991, p. 6). However, there is a deeper and more abiding relationship between Buddhist psychology and creativity that merits attention. In order to fully understand this link, we must briefly delve into the larger tradition of Buddhist psychology. Doing so will help ground our discussion moving forward.

Enlightenment and cognitive interpretations

The purpose of Buddhism is to attain *enlightenment* for the benefit of all sentient beings (for a review, see Kudesia and Nyima 2014). Enlightenment is a state of subjective experience that, unlike

conventional experience, is firmly rooted in an understanding of reality *as it is* as opposed to some personally or socially constructed reality based on our personal history, language, ideologies, and desires. As such, Buddhism also suggests that those of us who are not yet enlightened misperceive reality. This misperception is evident in even simple statements such as "I saw the blue river." We can unpack this statement through the perspective of Buddhist psychology to better understand what enlightenment means and why it relates to creativity.

To begin with, there is no such thing as blue "out there" in the world. Colors do not reside in objects like rivers, but emerge from the interaction of reflective properties of objects, anatomical properties of our eyes, and electromagnetic radiation (Lakoff and Johnson 1999). Buddhism would then point out that beyond physics and physiology, language and culture also determine our experience of colors. For example, the exact same wavelength of light is classified by a Berinmo speaker from Papua New Guinea as green, while an English speaker would call it blue (Roberson, Davies, and Davidoff 2000). Thus, Buddhism would suggest that we do not *see* the river as blue, we *create* the river as blue through our biocultural interpretations. It is the same for the river. For example, in English, we have the words "river" and "stream." In French, "fleuve" and "rivière." The English words differ on the basis of size, as a river is larger than a stream. The French words differ on the basis of direction, as a fleuve flows to the sea while a rivière does not. As such, when an English speaker and French speaker look at the same flowing water, they actually create different mental images: one is determined by size, the other by direction (Culler 1986, pp. 33–4). So, according to Buddhism, the "blue river" is not something objective and independent of the viewer, but subjective and dependent on the viewer.

The Buddha once remarked that his entire teaching is encapsulated in the realization that subject and object are interdependent and co-created. We see the world based on our ideas of it, and our ideas define who we are and determine our place in the world. Subject and object are mutually created and mutually sustaining interpretations of reality. The purpose of meditation is to help us gradually drop these interpretations until we can view *what is* without imposing any top-down interpretive structures on reality. The metaphor given within Buddhism is that the enlightened mind is like a perfect mirror that reflects reality without any additions or subtractions. It sees the

shapes, forms, and movements of the flowing water without externalizing and objectifying it and without feeling any need to interpret, analyze, or label it. Most of us, however, not only impose our interpretations on the world, but also mistake our interpretations for reality. This limits us in a number of ways. We often get entrenched in particular ways of viewing the world, assumptions about how people and situations are or should be, and wrong views of ourselves, our abilities, and our purpose in life.

What is mindfulness?

Mindfulness is the first stepping-stone to enlightenment: it creates the space in which we can start to gently unravel the tangled webs of our mistaken interpretations. The reason for our diversion into Buddhist psychology should now become apparent. It is impossible to exhibit creativity when one is firmly steeped in rigid and fixed views about objects, the world, and the self. In mindfulness, the habitual and conventional interpretations are held in abeyance, which allows one to pursue new and more adaptive ways of seeing the world. In some mindfulness training, this is called *beginner's mind* because it enables one to be "receptive to new possibilities" and not get "stuck in the rut" of expertise, "which often thinks it knows more than it does" (Kabat-Zinn 1990, p. 35). As suggested at this chapter's outset, I believe that mindfulness represents a state of mind that speaks rather directly to the kind of cognitive flexibility and creative insight required in the modern workplace. It builds unique cognitive abilities that enable creativity in individuals that otherwise would be trapped in conventional ways of interpreting their world. It is all the more promising because unlike other individual difference factors, it is directly trainable, which increases its promise as a possible workplace creativity intervention.

Remembering, focusing, and monitoring. Mindfulness is a complex and nuanced construct that has not yet been operationalized in a manner that both fully encompasses the original concept and enjoys broad consensus among researchers (Chiesa 2012). This is unsurprising as Buddhist psychology sees mindfulness as a state that is fundamentally inexpressible through language or statistics (Trungpa and Goleman 2005) and uses its Sanskrit term *smṛti* in a variety of ways that include remembering the past, focusing on a chosen stimulus, and monitoring

mental activity (Lutz, Dunne, and Davidson 2007). To illustrate this diversity of uses, consider the context in which mindfulness originally arose. When the first Buddhist monks set the intention of attaining enlightenment, they could not simply sit and meditate all day. They had to engage in and organize a growing community of practitioners and undertake acts of service within their larger society. While acting, it is quite easy to lose track of one's higher intentions, especially when they are abstract like enlightenment. For this reason, the Buddha emphasized to monks the importance of *remembering* their intention of enlightenment, *focusing* on their actions in the present moment, and *monitoring* this activity in a particular way to ensure their actions are consistent with their intentions. This simultaneous combination of remembering, focusing, and monitoring constitutes mindfulness in its original context.

Although we all revert to our habitual ways of acting from time to time, it is mindfulness that helps us become aware of such transgressions and allows us to re-engage our intentions. Those who are low in mindfulness may only notice their transgressions after the fact. However, as mindfulness increases, individuals can monitor and adjust their behavior in real-time. This ensures that when one sets an intention, it is carried forward into one's actions. Mindfulness thus has the great value of making us self-aware and creating the space for us to shift out of our automatic, habitual, and mindless ways of thinking and acting. As mindfulness grew increasingly integrated into Western psychology, the importance of remembering and monitoring subsided and attending to the present moment was emphasized. What got lost in translation was that mindfulness is less about paying *attention* to whatever is *occurring* in the present and more about carrying forth one's *intentions* into whatever one is *doing* in the present (Kudesia and Nyima 2014). As such, mindfulness may be less akin to a state of attention and closer to a self-regulatory process. It is a particular way of remembering one's intentions while acting and adjusting one's attention accordingly. I suggest it is a particular way because it is certainly not the only way. You could put Post-It notes around the office reminding you to practice compassion, but that is certainly not mindfulness.

An operational definition. In an interesting and productive ongoing dialogue with a Buddhist monk, we jointly identified three components of mindfulness that are both consistent with its original meaning

and tractable in research contexts (Kudesia and Nyima 2014). We define mindfulness as a state characterized by decreased discursive thought, heightened meta-awareness, and goal-based regulation of attention. By *discursive thought*, we refer to the tendency to put experience into words. In mindfulness, the present moment is experienced without the overlay of mental chatter. This helps us see things as they are, not as we imagine them to be in our linguistically constructed mental models. By *meta-awareness*, we refer to an increased state of detached self-observation. In mindfulness, one can more readily notice mental activity without getting caught up in it. It is akin to the difference between becoming angry and noticing that you are having angry thoughts and feelings; the latter shows greater psychological distance from mental experience and thus allows for greater regulation of it. By *goal-based regulation of attention*, we refer to the idea that higher order meta-cognitive faculties adjust attention so that it is focused only on goal-relevant aspects of the present moment and is broad enough to incorporate all relevant aspects. When mindful, individuals do not pay attention to the present in an indiscriminate way, but selectively attend to those aspects that are relevant to performing their intentions or goals. By defining mindfulness relative to these three components, we can understand the construct more fully and precisely.

Mindfulness and creativity

So far, we have reviewed creativity and mindfulness separately and explored their link in a general way. This section will highlight how mindfulness can impact creativity outcomes in two ways. It first reviews the existing empirical work and then delves into the underlying theoretical mechanisms, both direct and indirect.

Existing empirical studies

The extant literature is small, but supports links between mindfulness and creativity. For example, my colleagues and I have studied how mindfulness meditation impacts the process of incubation (Kudesia, Baer, and Elfenbein 2013). When individuals get stuck on a creative problem, they often take a break before approaching it once again. During this break period, the unconscious mind can either further activate past attempts or forget them. We hypothesized that allowing

individuals' minds to wander during breaks will encourage further activation of their past attempts. Conversely, we hypothesized that having individuals meditate during the break would help them to forget their past attempts and approach the problem with fresh eyes. In meditation, the goal is to attend solely to the breath, so any arising thoughts related to past attempts would be goal-irrelevant and thus inhibited. Our results supported this hypothesis. For questions that required re-encoding of the initial representation (like the widow's sister question mentioned earlier), allowing subjects' minds to wander produced no improvement because it further activated their past attempts. However, when subjects meditated, they focused their attention on breathing in the present moment and thus inhibited all thoughts from the past. This helped them forget their past attempts and led to a nearly 40 percent improvement in the second attempt.

This finding is consistent with other work. For example, after meditating, subjects show improvement on never-before-seen problems that require re-encoding, but not on problems that are solved through straightforward logical processes (Ostafin and Kassman 2012). In another study, subjects who had practiced mindfulness meditation over eight weeks were faced with a task that required them to measure out various amounts of water using jugs of pre-specified capacities (Greenberg, Reiner, and Meiran 2012). When this paradigm was first created, subjects typically found a pattern of solving problems; once they had this solution representation, they fixated on it (Luchins 1942). As a result, when their initial representation no longer applied, they were unable to find the answer. However, Greenberg *et al*. (2012) found that those who underwent mindfulness training did not fixate on their initial solution representations and could flexibly adjust solutions in response to the demands of the situation. This led to greater rates of problem solving.

In another study, my colleagues and I looked at how mindfulness meditation impacts incubation in the divergent mode of thinking (Kudesia *et al*. 2013). We did so by asking subjects to think of as many unusual uses as they could for everyday objects like a brick. In line with our hypotheses, we found that when individuals' minds wander, they come up with new ideas that are further elaborations of their past attempts. As a result, their responses end up conceptually quite similar to each other: if they first saw the brick as a tool, they later produced a number of different ways it could be used as a tool

(e.g. hammering, sanding, etc.). However, those who practiced mindfulness meditation in between attempts at divergent thinking questions thought more broadly: their new responses were less similar to their past attempts and conceptualized the brick in a variety of unique ways. For example, instead of listing a number of uses within a single category, their responses spanned categories by using the brick as, for instance, a tool, weapon, furniture, or art. Being mindful thus enables more flexible conceptualization and helps individuals let go of their past representations and solution strategies.

Direct theoretical mechanisms

The first component of mindfulness is decreased discursive thought, which means that mindful individuals do not process experience strictly through language. Instead of allowing their mind to chatter about and talk over the present moment, they engage with it more directly. This has been shown using function magnetic resonance imaging evidence in clinical settings. For example, individuals with social anxiety disorder have distorted self-views; mindfulness training benefits them by shifting them away from a mode of self-processing based on discursive thought to one based on experiencing the present moment experientially and without language (Goldin, Ramel, and Gross 2009). Mindfulness researchers suggest that when experience of the present is mediated by language, it is funneled through a particularly rigid, analytical, and evaluative mode of processing that diminishes cognitive flexibility (Hayes and Wilson 2003). Interestingly, creativity researchers have suggested the same: the language through which we interpret the world contains rigid assumptions that limit our ability to make "the creative leap" – language serves to "crystallize" thought, which is otherwise more "fluid" and flexible (Koestler 1964, p. 173). The way we talk about objects is derived from how we have experienced them in the past, which makes us unable to see them in new ways moving forward. Thus discursive thought not only crystallizes and makes thought rigid, but it does so in a way that is based on the past, and thus closes off new opportunities for the future.

This is directly in line with the original Buddhist focus on perceiving reality without fixed and narrow interpretations. By reducing the overlay of discursive thought and experiencing the present moment as it is, we can produce a space in which alternative ways of conceptualizing

events appear. In another line of research, a colleague and I have found significant and strong associations between the ability to "step back" from discursive thought, described by mindfulness researchers as decentering or defusion, and cognitive flexibility (Kudesia and Parke 2014). For example, using self-report measures, we found that the decentering component of mindfulness was related to the ability to flexibly consider multiple alternative interpretations of life situations while the attention regulation component of mindfulness was not. In another study that explores how stepping back from discursive thought enables flexibility, we asked subjects to complete several word stems (e.g. PO_TA_). However, we first exposed them to an incorrect answer that seemed like it may work, but did not (i.e. POTATO). Although subjects were even informed that this was a "common, but incorrect response," many were nonetheless unable to step back from its priming effects and flexibly re-encode the problem. Again, we found that the decentering component of mindfulness, but not the attention component, predicted the ability to disengage from the negative prime and thereby arrive at the correct answer (e.g. PORTAL).

As such, the relationship between decreased discursive thought and increased cognitive flexibility is a potentially important one. Accordingly, a study by Schooler, Ohlsson, and Brooks (1993) found that subjects who verbalized their problem-solving strategies performed worse on creativity questions requiring shifts in problem representations, but performance was unimpaired for non-creative questions. Processing information and solving problems through discursive thought thus impairs creativity. As a result, mindfulness may benefit creativity because it shifts individuals out of the framework of discursive thought, allowing for more fluid and flexible modes of cognition.

The second component of mindfulness is heightened meta-awareness, the ability to observe the mind. An important aspect of meta-awareness is working memory, the system that holds information in the mind and enables the overriding of habitual behaviors. Working memory is known to enable creative modes of thinking (Lee and Therriault 2013) and is increased by mindfulness training (Jha, Stanley, and Baime 2010; Mrazek *et al*. 2013). Working memory helps divergent thinking by allowing individuals to generate and hold multiple ideas simultaneously and then select novel ideas over more conventional ideas. It helps convergent thinking by allowing individuals to override habitual problem and solution representations. As such, mindful

individuals have greater mental space in which ideas can be held and manipulated. Thus, by increasing meta-awareness, mindfulness can improve creativity by increasing individuals' ability to utilize creative modes of thinking, more fully represent problems and solutions, and organize knowledge structures in new, complex, and creative ways.

The third component of mindfulness is attention regulation, the ability to modify the level of focus and breadth of attention to maximize goal-directed behavior. Mindful individuals can better engage in complex cognitive tasks by monitoring and regulating attention more efficiently (e.g. Brefczynski-Lewis *et al*. 2007; Kozasa *et al*. 2012). This can mean varying the level of focus and the breadth of attention when needed. These attention regulation abilities are being increasingly seen as important to creativity. One aspect that has been greatly emphasized is the ability to broaden attention and thereby incorporate greater amounts of data (Dewing and Battye, 1971; Kasof, 1997; Mendelsohn, 1976). In line with the concept of beginner's mind, creative individuals often exhibit decreased *latent inhibition*, which means they tend not to automatically exclude stimuli from attention that have been previously judged as being irrelevant (Dykes and McGhie 1976). Interestingly, decreased latent inhibition is a risk factor for psychosis and therefore may only serve as a benefit for creativity if individuals have sufficiently high intelligence to make sense of all the extra information they process (Carson, Peterson, and Higgins 2003).

Mindful individuals are also less likely to habituate and filter out stimuli simply because they correspond to past experience (Kasamatsu and Hirai 1966; Valentine and Sweet 1999). However, they also have greater abilities to regulate their attention processes, suggesting that the goal-directed attention regulation of mindfulness can maximize the positives of increased exposure to stimuli without engaging the negatives that lead to mental health issues. As such, mindful individuals may see improved creativity because they can selectively access greater information both externally, allowing them to take in more information from the world around them, and internally, allowing them greater access to take in their mental activity. For an overview of these paths, see Table 8.1.

Indirect theoretical mechanisms

In addition to its direct mechanisms, mindfulness may also increase creativity through a host of indirect mechanisms. For example,

Table 8.1 *Direct and indirect paths from mindfulness to creativity*

Mindfulness component	Mechanism	Explanation	Creativity outcome
Direct Paths			
Discursive cognition (-)	Cognitive flexibility	Reduced reliance on evaluative linguistic forms of processing	Beneficial for problems requiring shifts in mental representations or knowledge structures
Meta-awareness (+)	Working memory	Increased ability to hold multiple constraints and potential solutions in mind simultaneously	Beneficial for complex problems with many working parts or potential solutions
Attention regulation (+)	Access to information	Increased ability to broaden or narrow one's focus, thus controlling the flow of information	Beneficial for managing the creative process over time
Indirect paths			
Positive affect (+)	Category breadth	Broader categorization, thus increasing the number of possible connections of ideas	Beneficial for problems that require combination or abstraction processes
Task persistence (+)	Exploration behavior	More thorough and exhaustive exploration of the solution space	Beneficial for problems that persist over time and require external verification for each potential solution
Individual differences (+)	Personality change	Greater trait openness, acceptance, etc. enable creative cognition and its behavioral antecedents	Beneficial for seeking out creative problems, accessing diverse information, and thinking flexibly

mindfulness increases positive affect and reduces stress (Grossman *et al*. 2004). Positive affect refers to the subjective experience of pleasant feelings and increases creativity by broadening categorization, thereby creating new connections between ideas (Isen, Daubman, and Nowicki 1987). Likewise, as creativity is impaired by stress and negative affect (Shanteau and Dino 1993), the stress reduction benefits of mindfulness could translate to improved creativity as well. Mindfulness is also associated with greater task persistence in the face of failure (Evans, Baer, and Segerstrom 2009), which is an important contributor to creativity as well (Nijstad *et al*. 2010). With greater persistence comes a more thorough exploration of the conceptual space underlying a creative solution. Mindfulness is also associated with certain individual differences that are similar to the creative personality discussed earlier. Examples include being accepting and nonjudgmental, being willing to expose oneself to experiences, having insight into the nature of mental processes, and others (see Bergomi, Tschacher, and Kupper 2012). These traits could benefit creativity by increasing interest in open-ended problems, developing flexible ways of thinking, or prompting individuals to seek more diverse experiences (for similar arguments, see McCrae 1987). As such, mindfulness is related to creativity not only through its three components of diminished discursive cognition, heightened meta-awareness, and goal-directed regulation of attention, but also through additional indirect mechanisms.

Future research directions

While the empirical work and theoretical mechanisms I have outlined paint an initial picture of how mindfulness may relate to creativity, the potential body of future empirical work is large. One of the great benefits of mindfulness in theory testing is that meditation interventions can help manipulate potential mechanisms that cannot otherwise be measured. For example, my colleagues and I used mindfulness meditation and mind wandering to differentially impact two unconscious processes (i.e. activation of past attempts and forgetting of past attempts) that had not previously been tested side by side (Kudesia *et al*. 2013). Future work could also utilize findings relating mindfulness to flexibility in visual perception (e.g. Hodgins and Adair 2010) to explore how mindfulness may relate to spatial creativity problems to supplement existing work on verbal creativity problems. It could

also move beyond individual levels of creativity to group processes and see whether the decreased sensitivity to social rejection embodied in mindfulness (e.g. Heppner *et al*. 2008) improves the creative process in group settings. Finally, work that brings mindfulness and creativity research outside the laboratory and into workplace field settings is important as well.

Workplace mindfulness and creativity training

In this section, we transition from theory to practice. Most of the extant workplace mindfulness training focuses on wellness and stress reduction. I suggest that this offers two limitations related to developing creativity in organizations. First, the individuals who self-select into wellness interventions are likely not the same as those who would self-select into creativity interventions. By conceptualizing mindfulness as a creativity intervention, new employees can get introduced to meditation practices. The second limitation is that without making certain benefits more explicit, individuals may not become aware of them. For example, if mindfulness is seen as a wellness intervention, creative ideas that emerge as a result may be misattributed to other causes. Furthermore, individuals may not realize that these practices can apply to problem solving contexts and thus may have the tools but not the knowledge to fully apply them. While a full mapping of a workplace mindfulness and creativity training program is beyond the scope of this chapter, I have listed two key principles below that deserve practitioner attention.

Applied process knowledge

One of the most efficacious aspects of extant creativity interventions is that they deliver a great deal of knowledge about how the creative process works and thereby encourage individuals to alternate between divergent and convergent thinking and engage in sequential stages of gathering information, recognizing problems, generating solutions, and planning action. Any mindfulness creativity training should incorporate this valuable knowledge regarding the creative process. However, this process knowledge can be made more applied when integrated with mindfulness practices. For example, meditative practices vary along the continuum between focusing attention

on particular stimuli and broadening attention to openly monitor all arising stimuli. These techniques can be useful at different stages in the process to greater effect. For example, broadening attention will be more helpful in recognizing problems and generating solutions, while narrowing attention may be more helpful for verifying solutions and planning action. Likewise, means of inhibiting discursive cognition will be especially helpful in cases that require combination and abstraction rather than application and analogy. Furthermore, it is possible to develop meditative techniques specific for creativity that simultaneously activate important concepts while inhibiting common and conventional associations. As such, workplace mindfulness and creativity training should go beyond simply outlining the creative process, but instead tailor mindfulness practices to each stage of the process. Thus, applied process knowledge is the first guideline for such training.

Creative self-efficacy

Another important aspect of workplace mindfulness and creativity training is instilling the belief that one is capable of creative behavior. This is known as *creative self-efficacy*, and is an important predictor of creativity in the workplace (Tierney and Farmer 2002). It is quite possible that by highlighting the relationship between mindfulness and creativity and by providing specific techniques to facilitate creative cognition, employees would have greater creative self-efficacy. If this was paired with the understanding that creativity can be developed and is not some inherent and immutable property of people, training could increase the tendency of individuals to think creatively and to apply mindfulness to their creative projects.

Conclusion

In this chapter, I sought to make the link between workplace creativity and mindfulness more explicit. To do so, I first reviewed the creativity construct by highlighting the creative product, person, place, and process, examining its underlying cognitive mechanisms, and reviewing common means of training. I then overviewed Buddhist psychology to contextualize mindfulness as a process that reduces the rigidity of how we interpret our environment before defining mindfulness

as a state characterized by decreased discursive thought, heightened meta-awareness, and goal-directed attention regulation. After doing so, I reviewed the extant empirical literature and highlighted the theoretical mechanisms by which mindfulness can impact creativity, both direct and indirect. I then suggested future areas for research before providing some basic guidelines for workplace mindfulness and creativity training. It is my hope that this chapter can serve as a basis for a fruitful program of research and practice that pairs mindfulness and creativity.

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