Mindfulness in Organizations: A Cross-Level Review

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Keywords

Abstract

In recent years, research on mindfulness has grown rapidly in organizational psychology and organizational behavior. Specifically, two bodies of research have emerged: One focuses on the intrapsychic processes of individual mindfulness and the other on the social processes of collective mindfulness. In this review we provide a pioneering, cross-level review of mindfulness in organizations and find that mindfulness is neither mysterious nor mystical, but rather can be reliably and validly measured, linked to an array of individual and organizational outcomes, and induced through meditative and nonmeditative practices and processes at the individual and collective levels. Our analysis of the combined literatures further reveals that although each literature is impressive, there is a significant need for multilevel mindfulness research that simultaneously examines individual and collective mindfulness and broadens its conception of context. This research agenda provides a more robust understanding of the antecedents, processes, and consequences of individual and collective mindfulness as well as more definitive evidence maximizing mindfulness and its benefits in practice.

INTRODUCTION

"Live in the present." It's an ancient piece of advice, advanced throughout the ages. It is also the centerpiece of one of the most rapidly ascending lines of scholarship today: mindfulness research. The influence of mindfulness extends well beyond the legions of peer-reviewed studies on the topic and even a journal, *Mindfulness*, devoted to the scientific study of its eponymous subject to include an outpouring of popular press writing trumpeting the benefits of mindfulness, widespread adoption of mindfulness practice in training and development programs of major corporations ranging from Google to General Mills, features on prominent news programs such as *60 Minutes*, and even apps downloadable to most smartphones. Universities, too, have taken up the call. For example, the director of mindfulness education at UCLA's Mindful Awareness Research Center leads on average 200 people every week in a silent Mindfulness Awareness meditation class held at the Hammer Museum's Billy Wilder Theater (Hanc 2015).

Growth in the scholarly and practitioner popularity of mindfulness has paralleled and contributed to a corresponding growth in journalistic and scholarly critique (e.g., Ehrenreich 2009). More specifically, critics have deemed organizational implementations of mindfulness McMindfulness (Purser & Loy 2013) and criticized foundational mindfulness research as lacking sufficient rigor (e.g., Coyne 2014), or argued that the existing treatments of collective forms of mindfulness (e.g., Weick et al. 1999) have neutered it of its emancipatory potential (Purser & Milillo 2015). Still, the surge of interest in the topic dovetails with the observation that mindfulness can be studied systematically and rigorously. Through a combination of survey, experimental, neurocognitive, and inductive methods (e.g., conversation analysis, ethnography), researchers have placed mindfulness under the microscope, putting centuries-old claims about its benefits to the test.

Although such so-called scientization of mindfulness has also been critiqued, research has found that, consistent with longstanding historical claims, mindfulness matters. Evidence shows that it is associated with some of the very outcomes—enhanced psychological and physical well-being (e.g., Brown et al. 2007), for example—that people have long ascribed to it. Moreover, research indicates that mindfulness can prove beneficial in ways that even historical accounts of the phenomenon did not anticipate. To illustrate, researchers have demonstrated that mindfulness can slow aging (Epel et al. 2009), improve standardized test performance (Mrazek et al. 2013), and produce measurable changes in the human brain (Hölzel et al. 2011a). More germane to our review, organizational research indicates that individual mindfulness is positively related to employee outcomes such as work engagement (Leroy et al. 2013) and job performance (Dane & Brummel 2014), suggesting that mindfulness contributes to an organization's bottom line.

More recently, researchers have begun to investigate the employee and organizational consequences of collective mindfulness—defined as the collective capability to discern discriminatory detail about emerging issues and to act swiftly in response to these details (Weick et al. 1999, 2000; Vogus & Sutcliffe 2012)—and, in doing so, have found an array of benefits. For employees, mindful organizing is associated with lower turnover rates (Vogus et al. 2014a), and for organizations, collective mindfulness is positively related to salutary organizational outcomes including greater customer satisfaction (Ndubisi 2012); more effective resource allocation (Wilson et al. 2011); greater innovation (Vogus & Welbourne 2003); and improved quality, safety, and reliability (e.g., Vogus & Sutcliffe 2007a,b). Interestingly, these effects are most commonly observed in particularly trying contexts characterized by complexity, dynamism, and error intolerance.

Our review suggests that mindfulness research in the organizational sciences carries the potential to shift our thinking on the nature of mindfulness itself. The view of mindfulness advanced here—one buttressed by cross-level observations drawn from a careful review of more

than 100 empirical studies and an additional survey of dozens of conceptual papers—suggests that mindfulness is a more social construct than its name, implied mechanisms, and measurement implies. As revealed through our organizational and cross-level investigation, mindfulness is embedded in and powerfully shaped by multiple aspects of context, both in how it is triggered and how it connects to other processes and individual and organizational outcomes. Highlighting such connections, our review spotlights the emerging literature on collective mindfulness, which, as with many collective constructs (Morgeson & Hofmann 1999), is not only shaped by top-down organizational practices and processes but also enacted through a bottom-up process of social action and interaction. However, collective mindfulness adds nuance with its particular character, namely the focus of attention in collective mindfulness on the unexpected and the content of social processes that undergird anticipating, detecting, and responding to it (Weick et al. 1999). Although underemphasized in the literature, this claim follows from points raised in our review and provides guidance as to where scholars could focus their attention moving forward. Researchers in organizational psychology and organizational behavior are especially and even uniquely well-suited to integrate individual and collective mindfulness through multilevel theorizing and empirical research that could augment existing accounts of mindfulness and also reorient research in notable directions.

Despite these significant advances and noteworthy possibilities, mindfulness research remains in its nascent stages, especially in the organizational sciences. The purpose of this review is to synthesize multiple lines of research on mindfulness to provide organizational scholars with a better understanding of what mindfulness is (across various levels of analysis), how it can be measured, what fosters its development, and why and how it matters in the workplace. In addition, we highlight numerous promising avenues for further research, specifically discussing the cross-level and cross-cultural aspects of mindfulness. In the aggregate, the observations and frameworks advanced in this review not only provide greater clarity of this burgeoning scholarly domain, but also serve as a "user's guide" for scholars and practitioners seeking to navigate, enrich, and apply the insights emerging from this timeless and timely line of inquiry.

WHAT IS MINDFULNESS?

Although individual-level mindfulness does not have a single, universally accepted definition, progress on this front is apparent. Indeed, within organizational psychology and organizational behavior, definitions of individual mindfulness are more convergent than divergent. **Table 1** features numerous definitions of individual mindfulness culled from articles recently published by organizational and psychological scholars. For precision, we include each definition in its entirety, along with (wherever relevant) the citation(s) the authors included alongside their definition (to provide further insight into the conceptual lineage associated with the definition).

Common across these definitions is the observation that mindfulness is a particular state of consciousness—one in which an individual focuses attention on present-moment events. For example, Zhang & Wu (2014, p. 24) define mindfulness as "a mental state with the characteristics of present-focused awareness and attention." Similarly, mindfulness has been described as "a receptive state of mind wherein attention, informed by awareness of present experience, simply observes what is taking place" (Niemiec et al. 2010, p. 345). Defining mindfulness as a present-moment focused state of consciousness aligns with historical perspectives on the concept and is in keeping with investigations of the topic in cognitive and social psychology (e.g., Brown & Ryan 2003, Brown et al. 2007, Mrazek et al. 2012). Indeed, several of the definitions included in **Table 1** are rooted in a foundational observation published in the *Journal of Personality and Social Psychology*

Table 1 Definitions of individual mindfulness

Source	Definition of individual mindfulness
Baas et al. (2014)	A state of conscious awareness resulting from living in the moment (Brown & Ryan 2003, Kabat-Zinn 1994)
Carlson (2013, p. 175)	Attention to one's current experience and nonevaluative observation of that experience (Bishop et al. 2004)
Creswell & Lindsay (2014, p. 402)	Monitoring one's present-moment experience with acceptance
Dane (2011, p. 1000)	A state of consciousness in which attention is focused on present-moment phenomena occurring both externally and internally
Eisenbeiss & van Knippenberg (2015)	A meta-cognitive ability defined as "a state of being attentive to and aware of what is taking place in the present" (Brown & Ryan 2003, p. 822) and involves conscious perception and processing of external stimuli (in contrast to automatic tendencies)
Hülsheger et al. (2013, p. 310)	A state of nonjudgmental attentiveness to and awareness of moment-to-moment experiences (Bishop et al. 2004, Brown & Ryan 2003)
Hülsheger et al. (2014, p. 1114)	A state of consciousness in which individuals pay attention to the present moment with an accepting and nonjudgmental attitude (Brown et al. 2007, Kabat-Zinn 1994)
Langer (2014, p. 11)	An active state of mind characterized by novel distinction-drawing that results in being (*a*) situated in the present, (*b*) sensitive to context and perspective, and (*c*) guided (but not governed) by rules and routines
Leroy et al. (2013, p. 238)	A receptive attention to and awareness of external (e.g., sounds) and internal (e.g., emotions) present-moment states, events, and experiences (Brown & Ryan 2003, Dane 2011)
Niemiec et al. (2010, p. 345)	A receptive state of mind wherein attention, informed by awareness of present experience, simply observes what is taking place
Reb et al. (2014)	Present-moment awareness with an observing, nonjudging stance (e.g., Bishop et al. 2004, Brown et al. 2007, Mikulas 2011)
Ruedy & Schweitzer (2010, p. 73)	An individual's awareness, both internally (awareness of their own thoughts) and externally (awareness of what is happening in their environment)
Zhang et al. (2013, p. 433)	A present-focused awareness and attention (the presence factor) with an open attitude toward ongoing events and experiences (the acceptance factor) (Bishop et al. 2004)
Zhang & Wu (2014, p. 24)	A mental state with the characteristics of present-focused awareness and attention (Bishop et al. 2004, Brown et al. 2007, Langer 1989b)

that mindfulness is "the state of being attentive to and aware of what is taking place in the present" (Brown & Ryan 2003, p. 822).

Some definitions included in **Table 1** indicate that the present-moment attentiveness associated with mindfulness concerns not only external events but also internal (or intrapsychic) events, such as intuitions and emotions. For example, Leroy et al. (2013, p. 238) note that mindfulness involves attending to "external (e.g., sounds) and internal (e.g., emotions) present-moment states, events and experiences," and Ruedy & Schweitzer (2010, p. 73) observe that mindfulness concerns awareness of one's "own thoughts" as well as "what is happening in [one's] environment." Thus, mindfulness entails awareness of "phenomena occurring both externally and internally" (Dane 2011, p. 1000).

The portrait of individual-level mindfulness suggested thus far—i.e., paying attention to internal and external present-moment events—provides a basis for comparing and differentiating mindfulness from other attention-related concepts. For example, mindfulness is similar to absorption (Rothbard 2001) and flow (Csikszentmihalyi 1990), insofar as each of these states involves directing attention to present-moment events. However, mindfulness is distinct from these concepts because it involves wide attentional breadth—that is, it involves directing attention toward

not only external events and phenomena but also internal events (Dane 2011; see also Sheldon et al. 2015 for empirical distinctions between mindfulness and flow).

Despite the similarities across various definitions of mindfulness, differences exist. Most notably, definitions differ on whether mindfulness consists solely of focusing attention on present-moment events or whether additional features or qualities characterize mindfulness. For example, as reflected in **Table 1**, some definitions suggest that, to be mindful, one's connection to the present moment must be nonjudgmental (e.g., Hülsheger et al. 2013, Sheldon et al. 2015). That is, in attending to present-moment events, one refrains from making judgments or evaluations, and thus maintains a nonjudging stance (Reb et al. 2014). This view of mindfulness aligns closely with traditional Eastern perspectives on the topic, which emphasize the importance of adopting an open and accepting attitude toward the events one encounters (see Bishop et al. 2004).

A different line of research—one pioneered by Ellen Langer—defines mindfulness as "an active state of mind characterized by novel distinction-drawing that results in being (*1*) situated in the present; (*2*) sensitive to context and perspective; and (*3*) guided (but not governed) by rules and routines" (Langer 2014, p. 11; see also Langer 1989b). This definition departs from the others included in **Table 1**, most notably for its focus on drawing distinctions. Indeed, Langer's view of mindfulness is more directly tied to creative thinking than to Eastern perspectives on the concept. This does not mean, however, that Langer's views on mindfulness are incommensurate with Eastern perspectives. In fact, Langer (2014) has suggested the line often drawn between other accounts of mindfulness and her own is unduly stark.

Research on collective mindfulness exhibits greater definitional coherence than its individual analogue. This is primarily a function of Weick et al.'s (1999) highly influential work, which introduced the concept to organizational psychology and organizational behavior and has continued to serve as the canonical conceptualization. Their definition of collective mindfulness is alternatively referred to as mindful organizing (the two terms used interchangeably throughout our review) and originally builds on the individual-level work of Langer (1989a) and her three aspects of mindfulness (Weick et al. 1999). Collective mindfulness comprises five interrelated processes at multiple organizational levels: preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and deference to expertise (Vogus & Sutcliffe 2012; Weick et al. 1999; Weick & Sutcliffe 2001, 2006, 2007). Preoccupation with failure is the active consideration and ongoing wariness of the possibility of failure that treats any failure or near miss as an indicator of potentially larger problems (LaPorte & Consolini 1991). Reluctance to simplify interpretations means actively questioning received wisdom and operating assumptions to better uncover blind spots (Schulman 1993). Sensitivity to operations means creating and maintaining a current, integrated understanding of operations in the moment (Weick et al. 1999). A commitment to resilience involves growing employee and organizational capabilities to adapt, improvise, and learn in order to better recover from unexpected events (van Dyck et al. 2005). Finally, deference to expertise occurs when decisions migrate to those with the greatest expertise with the problem at hand, regardless of formal rank (Roberts et al. 1994).

Table 2 features a representative, but not exhaustive, set of definitions of collective mindfulness culled from articles recently published by organizational and psychological scholars. The influence of Weick and colleagues is evident, as most of the articles reviewed adopt their definition (or, in papers that precede it, inform their definition, e.g., Schulman 1993).

Collective mindfulness was originally developed to explain how high-reliability organizations (HROs) avoid catastrophe and perform in a nearly error-free manner under trying conditions. Over time, the focus has expanded to include "organizations that pay close attention to what is going on around them, refusing to function on 'auto-pilot'" (Ray et al. 2011, p. 188; also see Fiol & O'Connor 2003). In either case, unlike individual mindfulness, organizational mindfulness is

Table 2 Definitions of collective mindfulness

Source	Definition of collective mindfulness
Ausserhofer et al. (2013, p. 157)	To stay mindful, despite hazardous environments, frontline employees consider constantly five principles: tracking small failures, resisting oversimplification, remaining sensitive to operations, maintaining capabilities for resilience, and taking advantage of shifting locations of expertise
Barry & Meisiek (2010, p. 1505)	The capacity of groups and individuals to be acutely aware of significant details, to notice errors in the making, and to have the shared expertise and freedom to act on what they notice (from Weick et al. 2000, p. 34)
Carlo et al. (2012, pp. 1081–82)	A means to increase organizational reliability and mitigate the adverse potential of unexpected, so-called black swan events (Taleb 2007), and is characterized by five mindful behaviors, including continuous learning from failures and the willingness to consider alternative perspectives
Hales et al. (2012, p. 570)	When, in an organizational context, an individual maintains a level of alertness to the activities surrounding his/her job or task and awareness of how he/she contributes to an overall process that produces a good or service for a customer
Hargadon & Bechky (2006, p. 486)	Describes the amount of attention and effort that individuals allocate to a particular task or interaction, and, through mindful interpretation by group members of an ongoing experience and the mindful generation of appropriate actions, collective cognition connects individual ideas and experiences, both redefining and resolving the demands of emerging situations
Hoy et al. (2006, p. 241)	Preoccupation with mistakes, reluctance to simplify, sensitivity to day-to-day operations, resilience, and deference to expertise
Knox et al. (1999, p. 26)	Actively and continuously question assumptions; promote orderly challenge of operating routines and practices so successful lessons of the past do not become routine to the point of safety degradation; "outside view" actively solicited or created through active multidisciplinary review of the routine and debriefing of the unusual to prevent normalization of deviance
Mu & Butler (2009, p. 29)	An elevated state of awareness of expectations, a nuanced appreciation of the specific context, and an alertness to potentially significant changes in the face of new and unprecedented situations; takes into account the specific organizational situation rather than following bandwagon effects
Ndubisi (2012, p. 537)	Systems and processes to promote individual and collective mindfulness; a way of working marked by a focus on the present, attention to operational detail, willingness to consider alternative perspectives, and an interest in investigating and understanding failures
Ray et al. (2011, p. 188)	Referred to by some as organizational mindfulness, a construct developed initially to describe how high-reliability organizations avoid catastrophic errors (Weick & Sutcliffe 2001), but now increasingly used to characterize organizations that pay close attention to what is going on around them, refusing to function on "autopilot"; "mindful" organizations "induce a rich awareness of discriminatory detail and a capacity for action" (Weick et al. 1999, p. 88)
Valorinta (2009, p. 964)	Mindfulness refers to processes that keep organizations sensitive to their environment, open and curious to new information, and able to effectively contain and manage unexpected events in a prompt and flexible fashion
Wilson et al. (2011, p. 808)	The combination of ongoing scrutiny of existing expectations based on newer experiences, willingness, and capacity to invent new expectations based on newer experiences, willingness and capacity to invent new expectations that make sense of unprecedented events, a more nuanced appreciation of context and ways to deal with it, and identification of new dimensions of context to improve foresight and current functioning (from Weick & Sutcliffe 2001, p. 42)
Barrett et al. (2006), Vogus & Sutcliffe (2007a,b), Vogus & Welbourne (2003), Vogus et al. (2014a), Weick (2005), Weick & Sutcliffe (2003)	All use the categories of collective mindfulness and the definitions from Weick et al. (1999) and/or later adaptations by Weick & Sutcliffe (2001, 2007); other studies, such as LaPorte & Consolini (1991; preoccupation with failure, sensitivity to operations, commitment to resilience, and deference to expertise), Roberts et al. (1994; deference to expertise), and Schulman (1993; reluctance to simplify interpretations), constitute collective mindfulness

not viewed as an intrapsychic process or even an aggregation of intrapsychic processes. Instead, organizational mindfulness is a function of social practices, both action (Weick & Roberts 1993) and communication (Cooren 2004). In other words, collective mindfulness is a means of engaging in the everyday social processes of organizing that sustains attention on detailed comprehension of one's context and on factors that interfere with such comprehension (Vogus & Sutcliffe 2012; Weick et al. 1999; Weick & Sutcliffe 2001, 2006, 2007). The emergence of collective mindfulness in the course of ongoing organizing across organizational levels (Vogus & Sutcliffe 2012) puts it in tension with recent characterizations of organizational mindfulness as a relatively enduring, stable, and shared property of organization (Ray et al. 2011). Recent work by Carlo et al. (2012, pp. 1102–3) has reinforced a cross-level, emergent, and fragile definition of collective mindfulness as "a totality with intricately connected and interdependent components, from which organizational mindfulness emerges at the system level."

Although closely connected to Langer's foundational work, research in organizational behavior highlighting collective mental processes independently informed and shaped the initial formulation of collective mindfulness. Sandelands & Stablein (1987, pp. 137–38) proposed that organizations are mental entities capable of thought. As they argued, although *the* mind is commonly defined by what it is able to do, such as think, feel, perceive, or will, it is "not so much a substance with intellective powers as it is a process of forming ideas." Westrum (1992, 1997) suggested that some organizations (e.g., HROs) are "generative, thinking entities, protected by a comprehensive envelope of human thought" (1997, p. 237). Weick & Roberts (1993) showed that the reliable operations on naval aircraft carrier flight decks resulted from the "collective mind," embodied in the interrelating of crewmembers' social activities and interactions.

Weick et al.'s (1999) formulation of collective mindfulness has been subsequently refined to make enriched organizational attention and present moment awareness more focal (Weick & Sutcliffe 2006). This clarification of collective mindfulness has led to illustrations of "Eastern" perspectives on collective mindfulness (e.g., Weick & Putnam 2006) and increasing research in the domain of organizational attention (e.g., Rerup 2009). For example, building on Weick & Sutcliffe (2006), Rerup (2009) empirically illustrated attentional triangulation as a mindfulness-like state characterized by stability (concentration), vividness (complexity of representation of issues), and coherence (compatibility across individuals and collectives).

The conceptual elaboration and refinement of collective mindfulness have also been met with criticism. Fiol & O'Connor (2003) argued that two of the five processes of collective mindfulness needed significant change. First, they noted that a sensitivity to operations is mindfulness and not distinctive. Second, they argued that a preoccupation with failure limits the relevant contexts and, consequently, reformulated it as preoccupation with failure or success. Levinthal & Rerup (2006) posit that in its focus on attention and novelty, research on collective mindfulness underplays what they see as the critical importance of routine action, as well as Weick et al.'s (1999) focus on creating, enriching, and sustaining mindfulness. Lastly, as the collective mindfulness literature began to more formally adopt some of the language and concepts from the Buddhist tradition (e.g., Weick & Putnam 2006), Purser & Milillo (2015) have argued that the treatment of Buddhist doctrine is inappropriate and incomplete, stripping important context and emancipatory aims foundational to the perspective. These critiques, however, have remained at the periphery of collective mindfulness research but may provide useful future conceptual and empirical refinements.

Although definitional progress and convergence may well continue, we do not view complete definitional convergence as essential for research on individual and collective mindfulness to proceed. That multiple perspectives on mindfulness exist is emblematic of the richness of the mindfulness construct and the deep and wide-ranging lines of inquiry and practice that lie at the construct's core. Nevertheless, we do see value in cataloging and consolidating definitions, and
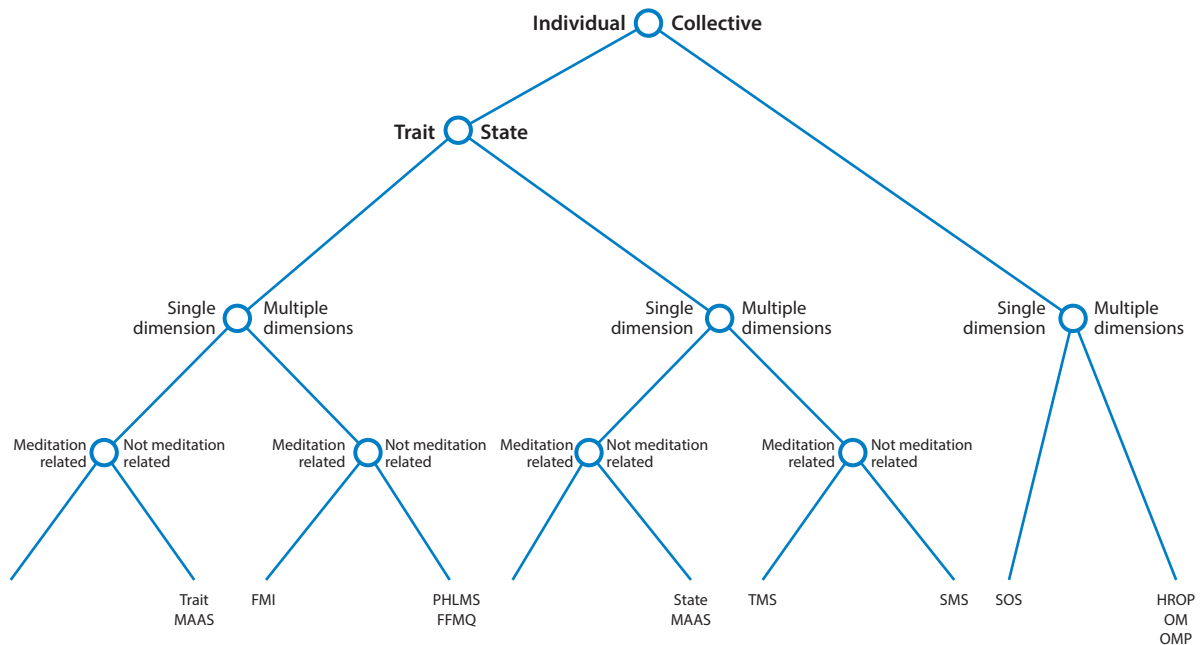
Figure 1

Measures of mindfulness decision tree. Abbreviations: FFMQ, Five Facet Mindfulness Questionnaire; FMI, Freiburg Mindfulness Inventory; HROP, high-reliability organization perceptions; MAAS, Mindful Attention Awareness Scale; OM, organizational mindfulness; OMP, organizational mindfulness processes; PHLMS, Philadelphia Mindfulness Scale; SMS, State Mindfulness Scale; SOS, Safety Organizing Scale; TMS, Toronto Mindfulness Scale.

we hope this review provides an advance in this direction. We further hope that articulating the individual-level foundations of collective mindfulness paired with the distinctive ways in which collective mindfulness is enacted illustrates points of connection, but also opportunities for putting these two concepts in relation to each other. (We return to the latter topic in the final section, Future Research Directions.)

MEASURING MINDFULNESS

Through our review of the literature, we encountered numerous scale-based approaches—and related techniques—for capturing individual-level mindfulness empirically. Given that many of these scales and their respective merits and applications have been reviewed recently (see Bergomi et al. 2013), we refrain from profiling them in depth. Instead, consistent with our focus on mindfulness in the workplace, we focus on the fit between specific mindfulness scales and the various theoretical perspectives, methodologies, and contexts by which organizational scholars may opt to study mindfulness. Bringing together the observations and prescriptions offered in this section, **Figure 1** provides researchers with a framework for selecting an individual-level mindfulness measurement approach given their theoretical interests and empirical objectives.

As individual-level mindfulness is, by its very nature, a state of consciousness, researchers have developed scales for assessing mindfulness at the state level, such as the Toronto Mindfulness Scale (Lau et al. 2006) and the State Mindfulness Scale (Tanay & Bernstein 2013). Such scales ask respondents to report how mindful they were during a task they just completed or a meditation

session they just engaged in. For an alternative, "real time" option for assessing state-level mindfulness, researchers might consider employing experiential sampling methods. For example, with the assistance of a smartphone app, researchers may contact research participants at random points during a given day or week and ask them to report what they are thinking about, how they are feeling, and whether their mind is on task (or situated in the present moment) versus off task (or away from the present altogether) (see Killingsworth & Gilbert 2010).

As with many state-level concepts (e.g., positive and negative affect), mindfulness can be conceptualized and measured not only as a state but also as a trait. Trait-level assessment is well-suited to correlational research linking mindfulness to global indicators of health and well-being as well as overall job performance. Researchers have their pick of several validated trait-level scales (e.g., Baer et al. 2008, Brown & Ryan 2003, Cardaciotto et al. 2008, Chadwick et al. 2008). If they are interested in the degree to which people tend to be mindful at work, researchers may consider adapting an existing trait-level measure to capture the degree to which one tends to be mindful within a given work context (see, e.g., Dane & Brummel 2014, Reb et al. 2015).

In selecting a measurement scale or technique, researchers should also consider how they view mindfulness conceptually. As noted above, definitions of mindfulness vary in their features and therefore some measurement approaches match certain definitions better than others. To illustrate, if one views mindfulness primarily in terms of attending to the present moment, one might consider using Brown & Ryan's (2003) Mindful Attention Awareness Scale (MAAS), given that it focused on this particular feature (see Van Dam et al. 2010 for an item-level assessment of the MAAS). Similarly, if one holds a multifaceted perspective on mindfulness, other measures, such as the Five Facet Mindfulness Questionnaire (Baer et al. 2008) or the Freiburg Mindfulness Inventory (Buchheld et al. 2001), are better candidates. By the same logic, researchers embracing Langer's (1989a,b) view of mindfulness should consider utilizing the Langer Mindfulness Scale, available for purchase through IDS Publishing (see Haigh et al. 2011 for a psychometric examination of this scale).

Finally, researchers should devote thought to whether meditation is germane to their research question or target population. Given the historical connections between mindfulness and meditation—and that, in some cases, researchers have used meditative training programs to "develop" mindfulness among study participants (discussed in the next section)—some mindfulness scales are catered toward those who meditate (e.g., Lau et al. 2006, Walach et al. 2006). At the same time, other scales—particularly those rooted in an individual differences perspective—presume no experience or familiarity with meditation including the MAAS (Brown & Ryan 2003) and the Philadelphia Mindfulness Scale (Cardaciotto et al. 2008). In short, depending on how one's study is designed (e.g., does it involve a meditative training program?) and what population(s) one is studying, one may opt for a mindfulness scale that calls for an understanding of (or experience with) meditation—or requires no such knowledge.

Relative to individual mindfulness, measurement of organizational mindfulness is much less developed with few valid measures. In fact, the majority of research examining organizational mindfulness is qualitative. Specifically, two-thirds of the works we identified as empirically investigating organizational mindfulness were qualitative, including action research (e.g., Hales et al. 2012), case studies (e.g., Bigley & Roberts 2001, Carlo et al. 2012, Madsen et al. 2006, Rerup 2009, Valorinta 2009), interview-based studies (Roth et al. 2006, Wilson et al. 2011), observational studies (Cooren 2004, 2006; Klein et al. 2006; LaPorte & Consolini 1991; Roe & Schulman 2008; Schulman 1993; Weick & Roberts 1993), and reanalyses of governmental reports (e.g., Weick 2005, Weick & Sutcliffe 2003) or previously published research (e.g., Barry & Meisiek 2010, McPhee et al. 2006). At its early stage of development, it is not surprising to observe a preponderance of qualitative research. These approaches allow researchers to develop a sense of

the grounded and ongoing nature of organizational mindfulness in a variety of settings extending beyond traditional high-reliability settings (e.g., aircraft carrier flight decks; Weick & Roberts 1993) to include architectural design and construction (Carlo et al. 2012), drug rehabilitation centers (Cooren 2004), and retail organizations (Valorinta 2009). Although helpful in detailing and representing the collective mindfulness construct across settings, several studies merely illustrate the known dimensions of collective mindfulness in different settings (e.g., health care; Wilson et al. 2011). Qualitative studies also inherently trade off replicability and generalizability for richness.

To build on the qualitative foundations of collective mindfulness research, quantitative measurement of collective mindfulness and its constituent processes have begun to proliferate. The direct assessment of collective mindfulness has almost exclusively taken the form of survey measures. Survey measures of collective mindfulness usually take one of two forms: a unidimensional construct such as the Safety Organizing Scale (SOS; Vogus & Sutcliffe 2007a) or a multifactor measure such as organizational mindfulness where each of the five processes (e.g., preoccupation with failure) represents a separate construct (although it may feed into a second-level factor; Ray et al. 2011). However, most measures of collective mindfulness have been subjected to limited validity testing. For these instruments to be valid, they need to demonstrate traditional psychometrics by meeting traditional thresholds for reliability and validity (e.g., convergent, discriminant, and criterion) as well as justify individual survey responses being aggregated to the collective level.

Vogus and Sutcliffe's SOS is a nine-item, unidimensional survey measure that demonstrates reliability, convergent validity, discriminant validity (from trust in leadership and affective commitment), the appropriateness of aggregating the measure, and criterion validity by linking it to organizational (e.g., patient safety, turnover) and individual (emotional exhaustion) outcomes across three studies of registered nurses in hospitals (Vogus & Sutcliffe 2007a,b; Vogus et al. 2014a). Ausserhofer et al. (2013) followed a similar approach in validating their versions of the scale in French, German, and Italian. Valentine et al. (2010) developed an eight-item organizational mindfulness scale on the basis of Weick & Sutcliffe's (2001) focus on individual assessments of a company's dedication to stakeholder interests, quality assurance, managing uncertainty, and positive business practices, finding support for reliability and validity (linked to corporate ethical values as an antecedent and role conflict as an outcome); however, their measure was not aggregated to a collective measure.

Ray et al. (2011) developed and validated a measure of organizational mindfulness in a sample of business schools. Their 42-item measure supported five distinct factors corresponding to each of the five components of collective mindfulness described by Weick et al. (1999), but their measure was validated at the individual, rather than the collective level. Similarly, Mu & Butler (2009) validated a five-factor, 38-item measure of organizational mindfulness processes in student and professional service organization samples. In addition to finding support for their hypothesized model, they also compared the levels of each of the five factors to top management preferences regarding how much each should exist in the organization. Commitment to resilience and deference to expertise illustrated the largest gap from "ideal" levels in a professional service organization. Hoy et al. (2006) validated in a sample of middle schools three similar 10-item measures, one for faculty, one for principals, and one for schools; they found support for aggregating individual survey responses to the collective level and linked their measures to corresponding measures of trust. Barrett et al. (2006) developed and validated a two-factor measure of high-reliability organizations' perceptions. They found support in a small sample of employees of a Midwestern fire department for two factors—self-efficacy and organizational risk responsiveness—in a confirmatory factor analysis, but did not aggregate their measure nor demonstrate criterion validity. Although all these measures need further refinement and validation, they are promising in their

ability to discriminate subcomponents of collective mindfulness and isolate their potential unique antecedents and consequences.

Other research has also used a range of indirect measures of collective mindfulness as part of quantitative studies. For example, Vogus & Welbourne (2003) undertook content coding of the company prospectuses companies filed for their initial public offerings as a way to illustrate how a set of specific human resource practices led to innovation and firm performance. Mindfulness has also been indirectly examined using proxies for its absence such as workarounds (Wheeler et al. 2012); using survey measures of related concepts such as care reliability, information reliability, and pre-emptive conflict handling as assessed by customers (Ndubisi 2012); or by inferring its existence through a set of specific outcomes (Knox et al. 1999).

Despite the evident progress validating measures of collective mindfulness—with some exceptions (e.g., Vogus & Sutcliffe 2007a)—most existing measures of collective mindfulness lack sufficient discriminant validation from related concepts such as psychological safety (Edmondson 1999), safety climate (leader and organizational attention and priority given to safety; Zohar 1980), transactive memory systems (Lewis 2003), team situation awareness (Salas et al. 1995), and other teamwork behaviors (e.g., backup behavior; LePine et al. 2008), among others. This represents a key gap because research on collective mindfulness is predicated upon it being a conceptually and empirically distinct construct. In other words, for collective mindfulness research to make significant inroads in mainstream organizational psychology and organizational behavior, more construct validation (especially assuring that measures of collective mindfulness are, in fact, collective measures) and better development of its nomological network are essential.

HOW MINDFULNESS DEVELOPS: EXPLORING ANTECEDENTS

Much research concerned with the development of individual-level mindfulness maintains—and seeks to demonstrate—that mindfulness can be developed through meditation (e.g., Jensen et al. 2012, Michel et al. 2014, Mrazek et al. 2013, Wolever et al. 2012). Such research takes its cue from programs such as mindfulness-based stress reduction (Kabat-Zinn 2003) and mindfulness-based cognitive therapy (Teasdale et al. 2000)—programs designed to help people achieve greater well-being through systematic and somewhat lengthy (several weeks, in many cases) training consisting of meditation sessions and exercises. Accordingly, in adopting or adapting such programs, researchers have focused not only on developing mindfulness through meditation but also on documenting specific outcomes associated with health and well-being [e.g., reduced stress and improved sleep quality (see Wolever et al. 2012; see also Eberth & Sedlmeier 2012 for a meta-analysis of meditative training programs and their outcomes)].

Building on the view that mindfulness is a byproduct of meditation—and condensing the timescale significantly—experimental research has shown that state mindfulness can be activated through brief meditation-related instructions and exercises (e.g., Hafenbrack et al. 2014, Ostafin & Kassman 2012, Papies et al. 2012, Reb & Narayanan 2014). For example, Hafenbrack et al. (2014) induced mindfulness through a 15-minute exercise that involved focusing attention on one's breath. Papies et al. (2012) induced mindfulness by displaying pictures to subjects and instructing them to consider the content—as well as the transience—of their reactions to the pictures they viewed. That state mindfulness can be induced in a short time frame through a variety of approaches has likely contributed to the bourgeoning of research on mindfulness in cognitive and social psychology (fields well-suited to experimental methods).

If one looks beyond research linking mindfulness to meditation, the body of work documenting antecedents to individual-level mindfulness is remarkably thin. Through our review of the

literature, we identified only a handful of studies investigating factors that influence the development of mindfulness and/or predict its occurrence. Interestingly, compared to other fields of psychology, organizational psychology and organizational behavior have played a more pioneering role here.

Dispositional Factors

As noted above, mindfulness can be theorized and measured as both a state and a trait. Although the origins of trait mindfulness have received little scholarly investigation, research indicates that trait affect is related to other dispositional characteristics. Through a meta-analysis, Giluk (2009) found that trait mindfulness is negatively related to neuroticism and positively related to conscientiousness and trait-level positive affect. To be sure, correlation does not imply causation, and it is therefore possible that high trait mindfulness explains and predicts a factor such as positive trait affect rather than the other way around. Even so, it may be the case that trait mindfulness is not only related to but also explainable via other aspects of one's personality—a possibility that gains theoretical import when contrasted with the prospect that mindfulness is primarily a product of meditation rather than dispositional or genetic influences.

Job Experience

Through a study of paramedics in Austria, researchers found that in acquiring experience, paramedics increased their level of mindful awareness; however, past a certain level of experience, mindfulness declined (Mitmansgruber et al. 2008). This finding aligns with the observation that, through overtraining or entrainment, a higher incidence of mind wandering (and hence, less mindfulness) is apt to occur within the task domain (Smallwood & Schooler 2006). Nevertheless, a decline in mindfulness at high levels of experience is perhaps not inevitable in all cases or contexts. Indeed, from the standpoint of focusing attention widely and drawing multiple distinctions (key features of mindfulness by varying accounts), a high level of experience may prove invaluable. In an inductive study of how trial lawyers focus their attention in the courtroom, Dane (2013) found that, compared to their less experienced colleagues, highly experienced trial attorneys were more adept at focusing their attention widely across events occurring in the courtroom (e.g., reactions from the judge, jury members, and opposing counsel) and more attuned to the ways such events could be enlisted to strengthen their case (e.g., interpreting an unexpected event as a potential opportunity). As experience is, by its very nature, complex in its character and multifaceted in its consequences on cognition and behavior, considerably more research is needed to determine whether and how experience of various forms relates to mindfulness across numerous performance contexts.

Organizational Factors

Through an online survey of working adults, Reb et al. (2015) found that supervisor support was positively related to employee awareness (a context-specific dimension of mindfulness capturing employees' awareness of their experiences, actions, and feelings at work) and that organizational constraints (e.g., conflicting job demands) were negatively related to employee awareness and positively related to employee absentmindedness (an additional context-specific dimension of mindfulness). As research on organizational influences on individual-level mindfulness remains in its infancy, we perceive much potential for further research in this area. In engaging this topic, scholars may wish to consider whether and how research on collective mindfulness and its antecedents (which we now turn to) inform our understanding of mindfulness at an individual level.

ANTECEDENTS OF COLLECTIVE MINDFULNESS

Consistent with the individual-level literature, there have been longstanding, but largely unanswered calls to empirically investigate the antecedents of collective mindfulness (e.g., Argote 2006). A closer read of the relevant literature on collective mindfulness, however, does provide a suggestive set of leader and organizational antecedents of collective mindfulness.

Leader Behaviors and Practices

Madsen et al. (2006; see also Roberts et al. 2005) documented the effects of two different leadership regimes on collective mindfulness in a pediatric intensive care unit. Specifically, leaders trained in high-reliability principles implemented continuing staff education, supporting frontline staff decisions, and postevent debriefings. In other words, a change in leadership resulted in new practices that empowered the bedside caregiver and enhanced teamwork, resulting in more mindful interactions among staff (Madsen et al. 2006, Roberts et al. 2005). A subsequent change in leadership that reverted to a more "traditional" approach undermined collective mindfulness. Rerup (2009) also used a longitudinal case study to illustrate how Novo Nordisk's implementation of the Novo Nordisk Way (e.g., a set of values and practices such as organizational audits and boundary-spanning facilitators that connected units) fostered greater and sustained attention to weak signals and overall attention quality. In a study of trauma units, Klein et al. (2006) found that active leaders with more confidence in themselves and their subordinates more frequently and skillfully engaged in dynamic delegation (i.e., deference to expertise) in response to the patient's condition. Knox et al. (1999) found that clear purpose, language, and procedures were key enablers of collective mindfulness. A handful of quantitative studies corroborate the importance of trust in leadership (Hoy et al. 2006, Vogus & Sutcliffe 2007b) and supportive leadership (Ausserhofer et al. 2013) for collective mindfulness.

Organizational Practices

A wide range of organizational practices that aid collective mindfulness are observed in HROs. The most consistently documented organizational practices that enable collective mindfulness include active socialization (e.g., through vivid stories; Weick & Roberts 1993), continuous training and simulations of rare events (LaPorte & Consolini 1991), and empowerment (i.e., delegating authority; Roberts et al. 1994). For example, airline flight crews trained in crew resource management such as training in effective communication, how to work as a team (e.g., workload sharing), error detection, and decision making are more mindful in their team communication and processes (McKinney et al. 2005). Additional human resource practices including careful selection practices (e.g., that minimize hubris; Schulman 1993), positive employee relations' climate and extensive training (Vogus & Welbourne 2003), and organizational HR effectiveness (Wheeler et al. 2012) are associated with indicators of mindfulness (e.g., fewer workarounds). A qualitative study of railroad operations showed that the combined use of a proactive set of interpersonal (i.e., communication) and technology-mediated (i.e., radios) monitoring practices aided collective mindfulness (Roth et al. 2006). Valorinta (2009) offers impressive case studies of two organizations to illustrate how information technology both enhances and inhibits collective mindfulness. IT enhances mindfulness by heightening attention through cultivating awareness of IT risks, careful analysis of issues, and increased organizational collaboration, as well as by enriching action repertoires (i.e., providing a toolbox for innovation and mandating change). IT inhibits mindfulness by routinizing, automating, and otherwise making work inflexible and difficult to enact. Finally, Barry & Meisiek (2010) suggest that the physical work environment, notably arts-based initiatives,

can foster mindfulness by directing attention away from immediate work concerns and toward analogous artifacts in ways that break habitual ways of seeing and believing.

WHY MINDFULNESS MATTERS: INDIVIDUAL AND ORGANIZATIONAL CONSEQUENCES

Emerging from and catalyzing the growth of research on mindfulness is the observation that mindfulness matters: It enhances physical and mental well-being (Brown et al. 2007) and improves performance and cognitive ability across a variety of task domains (e.g., Moore & Gardner 2014, Schmertz et al. 2009). As noted earlier, some benefits associated with mindfulness are quite striking. For example, mindfulness-related meditation training has been shown to increase gray matter density in the human brain (Hölzel et al. 2011a), improve working memory capacity (Jha et al. 2010), and slow aging (Epel et al. 2009).

Consistent with the aims of this review, we focus on outcomes most pertinent to the workplace. In doing so, we review research examining the effects of mindfulness on various reflections of worker well-being (e.g., work-related stress), overall performance in work settings, and performance on specific types of tasks found in organizations.

Worker Well-Being

Research has shown that trait mindfulness is positively related to worker well-being across a range of industries and occupations (e.g., Mitmansgruber et al. 2008, Roche et al. 2014, Schultz et al. 2014). Research has also demonstrated that meditative training programs reduce work-related stress (e.g., Bazarko et al. 2013, Wolever et al. 2012). Although decreased stress is certainly in keeping with the intention of such training programs, that mindfulness-based stress reduction programs have proved beneficial in studies focusing on employees in corporate settings suggests that the uptick of such programs in industry is not misplaced (see Gelles 2015 for more on the emergence of meditation and mindfulness in corporate settings).

Further informing our understanding of mindfulness and worker well-being, Hülsheger et al. (2013) found through a field experiment with working professionals that mindfulness reduced emotional exhaustion and increased job satisfaction. Along related lines, research has demonstrated positive relationships between trait mindfulness and work engagement and its subcomponents (e.g., vigor) (Leroy et al. 2013, Marzuq & Drach-Zahavy 2012). Both correlational and meditation-based research indicates that mindfulness promotes work/life balance among workers across multiple industries (Allen & Kiburz 2012, Michel et al. 2014). And in assessing mindfulness through a daily diary approach, Hülsheger et al. (2014) showed that mindfulness at work is positively associated with sleep quality among working professionals.

There has been very limited attention to the consequences of collective mindfulness for worker well-being. A recent study by Vogus et al. (2014a) finds a complex relationship between collective mindfulness and emotional exhaustion in a study of nurses. Specifically, the relationship between collective mindfulness and emotional exhaustion depended on the group's performance history, with collective mindfulness acting as a resource to cope with a history of adverse events that lowers emotional exhaustion; however, collective mindfulness itself acts as an emotionally exhausting demand when a group experiences few adverse events. This finding suggests that collective mindfulness is demanding (Levinthal & Rerup 2006, Schulman 1993, Weick & Sutcliffe 2001), but especially helpful in the most difficult circumstances. In a qualitative study of firefighter discourse, Scott & Trethewey (2008) found a similarly nuanced relationship with the collective mindfulness of firefighters being associated with amplifying weak signals and engaging in swift action for novel threats.

Overall Performance

Through recent research, scholars have connected mindfulness to global measures of behavior and performance in the workplace. In a study of nuclear power plant operations, Zhang et al. (2013) found that trait mindfulness was positively related to job performance for operators who held jobs high in task complexity (see also Zhang & Wu 2014, for relationships between trait mindfulness and safety performance in the same industry). Dane & Brummel (2014) found a positive relationship between workplace mindfulness and job performance among those working in a dynamic performance environment (the restaurant service industry) that remained significant when controlling for three dimensions of work engagement. Further, Reb et al. (2015) found positive relationships between work-related mindfulness and task performance and organizational citizenship behavior, respectively, within their survey of working adults.

Also relevant to overall performance, Eisenbeiss & van Knippenberg (2015) found that employees high in trait mindfulness responded more strongly to ethical leadership in terms of the effort and helping behaviors they put forth. This suggests that, in the presence of an ethical leader, individuals high in trait mindfulness are more likely to perceive and embrace the values and behaviors they perceive in ethical leaders—and to perform accordingly. Mirroring this finding, through a pair of cross-industry, survey-based studies, Reb et al. (2014) found that the trait mindfulness of supervisors is positively related to the well-being and performance of their employees. This finding suggests that the mindfulness of one person in an organization can influence the well-being and performance of others.

Consistent with collective mindfulness' connection to high reliability, numerous studies have qualitatively associated it with greater organizational reliability (LaPorte & Consolini 1991, Schulman 1993, Weick & Roberts 1993) and more effective response to disasters (Bigley & Roberts 2001), near-disasters (Rerup 2009), and traumas (Klein et al. 2006). In health care contexts, qualitative studies have also linked observed changes in collective mindfulness to mortality rates (Madsen et al. 2006, Roberts et al. 2005) and clinical outcomes (Knox et al. 1999). Other reanalyses of high profile disasters such as the Columbia Space Shuttle (Weick 2005), "excess deaths" of pediatric patients at the Bristol Royal infirmary (Weick & Sutcliffe 2003), and increases in mortality rates in a pediatric intensive care unit (Madsen et al. 2006, Roberts et al. 2005) have all been used to show the negative consequences of the absence of collective mindfulness.

A series of quantitative studies in hospital nursing units has found that collective mindfulness is associated with fewer medication errors (Ausserhofer et al. 2013; Vogus & Sutcliffe 2007a,b) and patient falls (Vogus & Sutcliffe 2007a). The positive effects of collective mindfulness were found to be stronger in workgroups that trusted their leaders and most fully implemented standard operating procedures (i.e., care pathways; Vogus & Sutcliffe 2007b). In an action research study of five intensive care units, Hales et al. (2012) investigated linkages between a 10-day collective mindfulness intervention and multiple forms of costs and found evidence of a decrease in the number of negative incidents between a nurse and a patient's family, a 50% reduction in the number of failed nurse supervisor inspections, and a slight improvement in patients discharged alive. However, for other costs (e.g., patient length of stay, cost per patient) there were no effects. Ndubisi (2012) found that three indicators of collective mindfulness (care reliability, information reliability, and preemptive conflict handling) were positively associated with customer orientation, customer satisfaction, and, in turn, customer loyalty in a hospital setting. In a qualitative study of professional service firms, Hargadon & Bechky (2006) find that mindful interactions trigger moments of reflective reframing where individuals demonstrate the difficulty of their problems and share their prior experiences that can help solve them and elicit collective creativity.

Task Performance

Through numerous experimental studies, researchers have examined relationships between mindfulness and performance on various types of tasks. Such research indicates, for example, that a core dimension of trait mindfulness, observation of external and internal phenomena, facilitates the generation of creative ideas (Baas et al. 2014). Similarly, scholars have found that trait mindfulness predicts performance on insight problem solving (Ostafin & Kassman 2012) and helps people maintain cognitive flexibility (Moore & Malinowski 2009). Similarly, research indicates that, through meditation training, people can overcome rigid patterns of thinking (Greenberg et al. 2012).

Experimentally induced mindfulness has also been shown to help people avoid falling victim to the sunk-cost bias (Hafenbrack et al. 2014) and to reduce people's tendency to emphasize negative information over positive information (Kiken & Shook 2011)—notable findings given how difficult it can be to resist or overcome cognitive biases. Equally remarkable, researchers demonstrated that individuals who participated in a two-week mindfulness-training course improved their Graduate Record Exam reading comprehension scores significantly (Mrazek et al. 2013).

Additionally, research indicates that mindfulness can improve performance in negotiations. Specifically, Reb & Narayanan (2014) found that individuals assigned to perform a short exercise designed to foster mindfulness claimed more value than others on a distributive negotiation task. Although this result points to a competitive benefit of mindfulness, research suggests as well that mindfulness can foster cohesiveness and thereby increase the performance of work groups. In particular, Cleirigh & Greaney (2015) found that groups composed of people who participated in a brief mindfulness intervention outperformed control condition groups on a decision-making task.

Research has also linked mindfulness to the moral domain. Here, researchers have observed that trait mindfulness is negatively related to unethical behavior on tasks susceptible to cheating or misreporting (Ruedy & Schweitzer 2010) and that mindfulness-related training is positively related to compassionate behavior (Lim et al. 2015). Along related lines, research indicates that both experimentally induced mindfulness and trait mindfulness are negatively related to retaliatory behavior in the face of injustice (Long & Christian 2015).

Although, generally, research paints a favorable portrait of the consequences of mindfulness for well-being, overall performance, and task performance, a few studies have exposed performance-related risks and limitations of mindfulness. In particular, experimental research has demonstrated that trait mindfulness is negatively related to both implicit learning (Stillman et al. 2014) and performance on judgments of semantic coherence (Remmers et al. 2015). Such findings serve notice that mindfulness is not categorically beneficial—a point worth considering as research trumpeting the merits of mindfulness continues to blossom.

How Does Mindfulness Work? Unpacking the Mechanisms

As research documenting the consequences of mindfulness (especially its benefits) has grown, scholars have devoted thought to how and why mindfulness contributes to the outcomes reviewed above. Echoing historical perspectives on the benefits of mindfulness, scholars have made the argument that, in a mindful state, individuals tend to be less likely to internalize the phenomena and events that surround or befall them. That is, by focusing on the here-and-now and remaining open to and accepting of unfolding events, individuals defray the tendency to take things personally—a tendency that can leave people vulnerable to interpreting events as a reflection or indictment of who they are (Ryan & Brown 2003). In reperceiving (Shapiro et al. 2006) the world in a manner that promotes the decoupling of self (Glomb et al. 2011), individuals are less prone to provocation

or indignation and more open, curious, and content—qualities promoting self-insight and mental and physical well-being (Carlson 2013).

Linking mindfulness to a concept popular in the psychological sciences, researchers have also argued that mindfulness facilitates self-regulation (e.g., Glomb et al. 2011, Hölzel et al. 2011b, Shapiro et al. 2006) and have suggested that, through meditative training, people can develop their self-regulatory capacities (Masicampo & Baumeister 2007). By its nature, self-regulation enables people to assume greater control over their actions and thus reduces their dependence on automatic mental processes (Glomb et al. 2011). Consistent with the view that mindfulness improves self-regulation and thereby reduces automatic responding, experimental research, for example, has demonstrated that individuals induced toward a mindful state are less impulsive in their reactions to attractive food than others (Papies et al. 2012). Experimental research also indicates that mindfulness reduces people's vulnerability to implicit biases concerning age and race (Lueke & Gibson 2015).

Complementing these observations, research indicates that mindfulness can improve a sub-component of self-regulation—emotion regulation—which in turn helps workers resist engaging in surface acting, an approach associated with emotional exhaustion (Hülsheger et al. 2013). As self-regulation is associated with a wide range of salutary and performance-related outcomes (see Tangney et al. 2004), the self-regulatory benefits of mindfulness may help account for the effects of mindfulness on both well-being and performance.

Individual and collective mindfulness may also produce favorable outcomes in the workplace through the interplay with perception and interpretation. In many work contexts, it is critical for individuals to attend closely to their surroundings, as the events and phenomena occurring around them may contain key information and, at times, signal potential threats (Bazerman 2014, Ocasio 2011). Mindfulness should prove pivotal in this regard given its wide attentional breadth (Dane 2011). Furthermore, mindfulness may increase the vividness with which people interpret their surroundings (Valentine et al. 2010, Weick & Sutcliffe 2006), especially searching for (and finding) weak signals of impending danger (Rerup 2009). By its nature, attentional vividness enables people to see more nuances and complexities in the events they observe. Thus, attentional vividness should enable workers to identify opportunities associated with their present circumstances and help them perform effectively (Dane 2013, Rerup 2009).

The five processes comprising collective mindfulness are seen to operate through social processes such as conversations. The content and form of conversations constitute important mechanisms through which collective mindfulness influences outcomes including coproduction and co-completion of utterances (Cooren 2004, 2006), reflective reframing (Hargadon & Bechky 2006), questioning working hypotheses and rigorously discussing errors and the possibility that something was missed (Madsen et al. 2006, Roberts et al. 2005), and portraying hazards in uncertain and novel terms (Scott & Trethewey 2008). The larger system of interaction surrounding conversation, including shared shorthands (McKinney et al. 2005), shared mental models (Roth et al. 2006), common beliefs regarding organizing practices (McPhee et al. 2006), and how one's interactions fit into and support the system (Weick & Roberts 1993), also importantly shapes the specific content of conversations. Collective mindfulness also cultivates feelings of efficacy, empowerment (Klein et al. 2006), and a learning orientation (Gärtner 2013).

The mechanisms reviewed here are not mutually exclusive and, indeed, may coincide in some cases. For example, as some researchers have suggested, decoupling of self may either give rise to (Shapiro et al. 2006) or follow from (Glomb et al. 2011) self-regulation. Similarly, for collective mindfulness, discourse and norms or systems of interaction are reciprocally and tightly linked. Nevertheless, some mechanisms may be more pertinent to some outcomes than others. In the realm of well-being, for example, decoupling of self and self-regulation may prove paramount

whereas, when it comes to job performance, self-regulation, attentional vividness, or conversational practice may be more relevant.

FUTURE RESEARCH DIRECTIONS

Our review illustrates the significant theoretical and empirical progress in the mindfulness literatures. Reflecting its comparative maturity, the individual mindfulness literature exhibits considerable measurement sophistication (multiple, validated measures), well-established antecedents and interventions, and linkages with a range of outcomes. Work on its mechanisms, as described above, merits further conceptual development and empirical study. Collective mindfulness research exhibits impressive conceptual coherence and a growing body of qualitative and quantitative work, but at the same time more needs to be done to expand its reach beyond HROs to organizational psychology and organizational behavior more broadly (e.g., Carlo et al. 2012; Fiol & O'Connor 2003; Levinthal & Rerup 2006; Weick & Sutcliffe 2001, chapter 1; Weick & Sutcliffe 2007, pp. 18–21) perhaps by exploring more prosaic contexts (e.g., Ndubisi 2012) or a wider range of outcomes (e.g., the search for and construction of entrepreneurial opportunities; Barton 2010, Rerup 2005, Vogus & Welbourne 2003). Despite these significant strides, opportunities remain for further research at the individual and collective levels, as we have suggested throughout the review. In our discussion we focus on future research that capitalizes on what we see as the unique strength of organizational researchers—cross-level studies of mindfulness (see **Table 3** for a summary of questions for future research). We include both conceptual and empirical approaches to better integrating individual and collective mindfulness.

CROSS-LEVEL MINDFULNESS RESEARCH

Evidence is building that is suggestive of a multilevel and reciprocal relationship between individual and collective mindfulness. For example, leaders who initiate more mindful social processes such as appreciative inquiry and scenario planning, engage diverse stakeholders, and fuel efforts to be in the present by considering new perspectives, categories, and new information may fuel individual mindfulness (Fiol & O'Connor 2003, Ritchie-Dunham 2014). Alternatively, research by Cleirigh & Greaney (2015) suggests that individual mindfulness influences group interactions and group/organizational performance. Schultz et al. (2014) find that individual mindfulness reduces defensive responses to some situations. Naturally we can speculate the salutary mechanisms through which lower defensiveness may influence collective interactions. However, given that research is limited, we might simply conclude that individual mindfulness may matter to collective mindfulness. More research is needed to create a generalizable multimethod model for mindfulness, which combines top-down and bottom-up mechanisms. We offer numerous possibilities for future research starting with the interplay of individual and collective mindfulness and moving to top-down cultural and organizational enablers of mindfulness, bottom-up mechanisms through which mindfulness imprints culture, and close with the potential importance of affective mechanisms.

Individual and Collective Mindfulness

One of the most important unanswered questions relates to the form of the relationship between individual and collective mindfulness. Is there a relationship? If so, to what extent are individual and organizational mindfulness linked? Although the early conception of collective mindfulness grew out of Langer's (1989a) research on individual mindfulness, collective mindfulness was not

Table 3   Areas for future research

Research need	Potential research questions
The relationship between individual and collective mindfulness	Is there a relationship between individual and collective mindfulness? What level of individual mindfulness is necessary for a group to be collectively mindful? Can a single mindful individual induce collective mindfulness? Does the mean level or spread in individual mindfulness matter more for collective mindfulness? Do the effects of individual mindfulness on collective mindfulness depend on supportive leaders or organizational processes (e.g., group norms)? Does collective mindfulness influence individual mindfulness? If so, does it require sustained exposure to collective mindfulness?
National culture and mindfulness	Do cultures characterized by a focus on the present observe higher levels of individual and collective mindfulness? Are collectivistic cultures and their attendant levels of interdependent selves, dialectical thinking, and duality associated with higher levels of individual and collective mindfulness?
Organizational culture and practice antecedents of mindfulness	What are nonmeditative means by which organizations can foster individual mindfulness? Are leader inclusiveness and a climate of psychological safety associated with higher levels of collective mindfulness? How does collective mindfulness shape organizational culture over time?
Contextual boundary conditions on mindfulness–performance relationship	Do the positive performance effects of individual and collective mindfulness only hold for complex or dynamic work environments and jobs? Are the performance benefits of individual and collective mindfulness greater than the costs of inducing mindfulness (e.g., mindfulness training)?
Affective underpinnings of mindfulness	Does emotion regulation in the form of feeling rules reduce arousal and foster greater individual and collective mindfulness? Do affective forecasting accuracy and emotional intelligence result in higher levels of individual and collective mindfulness? Does emotional ambivalence (e.g., simultaneous doubt and hope) sustain collective mindfulness over time?

grounded in an assumption that individual mindfulness is a necessary precondition for it. It is possible, however, that the thought processes of individual mindfulness are an antecedent. If individual mindfulness does augur collective mindfulness, what is the composition of the group necessary to produce collective mindfulness? Does the average level of individual mindfulness matter more or the dispersion of levels? Alternatively, can a single highly mindful individual through processes resembling minority influence (e.g., Nemeth & Staw 1989) foster higher levels of collective mindfulness? Are factors such as group norms or leader behaviors necessary for translating individual mindfulness into collective mindfulness? It is also possible, and worth exploring, that sustained engagement with a group exhibiting the rich patterns of acting and interacting of mindful organizing correspondingly influences individual mindfulness.

National Culture

Along related lines, scholars could explore whether the degree to which employees tend to be mindful varies from one culture to another (across the same types of positions and organizations). This possibility finds support in research suggesting that national cultures differ in the degree to which they are oriented toward the past, present, and future, respectively (e.g., Guo et al. 2012,

Trompenaars & Hampden-Turner 1998). It is perhaps the case, for example, that mindfulness tends be high in nations characterized by a high focus on the present. At the same time, it may be the case that, as with individuals, cultures can rank high (or low) across all three temporal targets (see Shipp et al. 2009)—and that certain combinations (e.g., focusing highly not only on the present but also the past and/or the future) may be well-suited to mindfulness. Through empirical investigation, researchers could assess these possibilities and, more generally, explore how the routing of attention within and across time at the individual level is shaped by the broader cultural environments (both organizational and national) in which individuals work. Similarly, collective mindfulness may be more likely to emerge and be sustained in collectivistic cultures frequently characterized by a strong interdependent self (Markus & Kitayama 1991), dialectical thinking (Peng & Nisbett 1999), or organizational capabilities for duality (Farjoun 2010), all of which merit exploration.

Organizational Culture and Practices

Research is also underdeveloped with regard to where, when, and how mindfulness arises in work settings. Although some prominent corporations, including Google and General Mills, have adopted meditation training designed to foster mindfulness among their employees (see Gelles 2015), it is perhaps safe to assume that, at least in corporate America, such practices remain the exception to the rule. Nevertheless, various aspects of organizations, such as their level of supportiveness (Reb et al. 2015), may shape the degree to which an organization's members are individually mindful, regardless of whether the organization has instituted programs specifically designed to develop employee mindfulness. By pursuing this observation further, scholars could deepen our understanding of the interplay between organizational factors and individual-level mindfulness and gain insight into how mindfulness in organizations can be fostered or "managed" through nonmeditative means. Similar organizational practices can also fuel collective mindfulness as they instill and shape the social practice. Factors such as psychological safety (Edmondson 1999), where members of a workgroup feel safe to take an interpersonal risk, or leader inclusiveness (Nembhard & Edmondson 2006), whereby leaders solicit divergent opinions from workgroup members, might be especially promising for fostering collective mindfulness. In addition, mindful organizing may have a reciprocal relationship with the content of an organization's culture. That is, the interactions occurring through processes of mindful organizing (e.g., questioning assumptions, attempting to learn from small discrepancies and deviations) may reinforce, or even amplify, cultural values such as psychological safety, learning orientation, reflection, and learning. The top-down effects of culture and organizational practices on both forms of mindfulness as well as the bottom-up process through which mindful processes shape culture merit further exploration.

Contextual Boundary Conditions

Although research points to the performance benefits of mindfulness in the workplace, our review suggests that these benefits may be amplified within (or perhaps limited to) specific contexts (e.g., dynamic work environments or complex jobs). Further work is therefore needed to better understand the circumstances under which mindfulness is conducive to performance and, as noted above, the forms of performance to which it is conducive, especially at the organizational level. Another contextual boundary condition that has received little attention in existing research is the cost of mindfulness. In collective mindfulness research, this question has received little attention because for HROs the costs of a disaster (e.g., nuclear meltdown) outweigh virtually any investment to avoid it. However, making individual and collective mindfulness applicable to a wider array of

contexts depends on a more careful measurement of the costs of developing it and the benefits achieved relative to those costs (e.g., the cost of individual mindfulness training relative to its benefits on productivity, turnover, etc.). It would also be useful to understand when and why mainstream organizations pursue these processes of mindful organizing in the absence of obvious threats (Sutcliffe & Vogus 2014).

Affective Mechanisms

Emotion regulation (i.e., reducing arousal) is a mechanism that seems to underlie individual mindfulness and could help bridge individual and collective forms of mindfulness. Individual mindfulness research finds that mindfulness fosters emotion regulation that reduces emotional exhaustion (Hülsheger et al. 2013). The salutary effects of emotion regulation might help collectives sustain the demanding processes of mindful organizing (Schulman 1993), especially in trying conditions. Thus, emotion regulation may be a promising mechanism by which individual mindfulness fosters collective mindfulness. In addition, group or organizational feeling rules (Hochschild 1979) may help regulate emotion and guide interpretations in ways that foster individual and/or collective mindfulness. Other affective mechanisms also seem promising for future research, including emotional intelligence and affective forecasting accuracy in accounting for the benefits of mindfulness (see Emanuel et al. 2010, Schutte & Malouff 2011). Vogus et al. (2014b) have previously outlined how emotional ambivalence, the simultaneous experience of two emotions, in the form of simultaneous doubt and hope may help sustain collective mindfulness in HROs. The role of emotional ambivalence for individual and collective mindfulness also merits empirical investigation.

IMPLICATIONS FOR PRACTICE AND CONCLUSION

Although operating differently, mindfulness in individuals and collectives has far-reaching benefits for health and well-being, work meaningfulness, and individual and organizational performance. Thus, two courses of action seem merited: (*a*) Leaders and their organizations should think about individual and collective forms of mindfulness as targets for intervention, and (*b*) careful consideration should be paid to the range of interventions documented to elicit mindfulness (e.g., mindfulness training, careful selection and staffing, and leader behaviors). In other words, we endorse a holistic approach to assessing an organization's mindfulness needs and one that chooses the focus based on where mindfulness is most critical to the organization (e.g., for individual, independent task performance or team-based work) and the employee.

Mindful engagement with one's life and work has been of enduring interest to philosophers, practitioners, and scholars alike. We have moved beyond more general treatments of mindfulness as a cognitive phenomenon to illustrate how, in organizations, individual mindfulness is contextually embedded and processes of collective mindfulness are socially enabled and enacted with both forms of mindfulness significantly benefitting individuals and their organizations in multiple ways. We argue that an organizational perspective on mindfulness holds promise for developing an integrated multilevel theory of mindfulness by fully depicting the varied ways in which individual mindfulness, collective mindfulness, and organizational context are mutually constitutive.

DISCLOSURE STATEMENT

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