Towards an Integrated Model of Mindfulness at Work:

Development of the Mindfulness at Work Scale

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Abstract

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The application of mindfulness in organizations has been steadily rising. Despite the popularity of applying mindfulness to the workplace, the use of mindfulness techniques at work has outpaced scientific understanding of it. Although several measures exist that tap into general mindfulness, few work-specific measures of mindfulness existed prior to this set of studies. Therefore, the primary goal of this set of studies was the development of a measure of mindfulness at work (MaW). For the first study, the MaW scale was developed using the recommended stages of scale development, progressing through item generation, subject matter expert feedback, piloting, and psychometric testing (exploratory and confirmatory factor analysis). At the end of the first study, the MaW reduced down to 29 items with two dimensions, individual and organizational mindfulness at work. In the second study, the MaW was then validated using a variety of convergent and discriminant measures. The MaW was further reduced down to 11 items following this study. For the third study, the effects of individual and organizational mindfulness at work on each other were tested using a cross-lagged panel design, including contextual factors of ethical leadership and perceived organizational support. The psychometric properties of the 11-item MaW were also re-tested using confirmatory factor analysis. Findings suggest that organizational mindfulness leads to stronger individual mindfulness, and that ethical leadership and perceived organizational support lead to stronger organizational mindfulness. Limitations of the studies, implications for training mindfulness at work, future research suggestions, and how to apply mindfulness to the research process are discussed.

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Chapter 1: Mindfulness at Work

Recent years have seen a significant rise in mindfulness interventions and mindfulness research in the workplace. Companies like Google, Apple, and Aetna, as well as organizations like the military and government, are all using mindfulness as a part of their organizational strategy. Interest in mindfulness in the workplace is due to a clear link between mindfulness and important workplace outcomes like well-being, reduced stress, less burnout, and increased engagement (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Leroy, Anseel, Dimitrova, & Sels, 2013; Lomas et al., 2017; Taylor & Millear, 2016), among others.

The popularity and relevance of the current mindfulness paradigm emerged out of clinically informed therapeutic applications of mindfulness practices like mindfulness-based stress reduction (MBSR, Kabat-Zinn, 1990; Kabat-Zinn, 2003) and mindfulness-based cognitive therapy (MBCT, Teasdale, Segal, & Williams, 1995). These techniques are founded in mindfulness meditation, a method of cultivating attention and awareness that has roots in spiritual traditions like Buddhism and Hinduism, and generally involve extensive training and practice in mindfulness as a skill. These approaches are often implemented to treat psychological concerns like depression and anxiety, but these clinically-focused mindfulness approaches might not be the most appropriate when applied to the workplace. Other conceptualizations of mindfulness exist that focus on active, thoughtful, reasoned action (Langer, 1989), but the primary application of mindfulness in the workplace is rooted in these pre-existing clinically informed approaches. This research attempts to integrate a variety of conceptualizations of

mindfulness into a single measure of applied mindfulness at work that is inherently non-clinical in nature.

Taking these pre-existing approaches, trainings, and conceptualizations of mindfulness without some alteration, given a change in focus from therapy to the workplace, is questionable for several reasons. Workplace interventions are usually not meant to treat psychological distress, so approaches to mindfulness at work should be non-clinical in nature unless there are explicit clinical concerns. Not only should they be non-clinical, but mindfulness interventions in the workplace should be tailored to the work environment to increase the chances of training transfer (Burke & Hutchins, 2007). To meet these needs, training in mindfulness at work might look very different than the traditional practice of sitting still and following your breath, or might be very individualized and personal to suit the needs of the employee. However, any measure of mindfulness at work used for organizational research and assessment of training effectiveness should be contextualized to the experience of the workplace, not generalized across other life domains, as are other mindfulness measures (e. g. Baer et al., 2006; Brown & Ryan, 2003; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008; Lau et al., 2006). The primary goal of this dissertation was the development of and theoretical testing of a new measure of mindfulness at work, the Mindfulness at Work scale (MaW), along with initial validation and exploratory research.

Current Mindfulness Conceptualizations and the Present Research

Mindfulness as presently conceptualized consists of two complementary definitions. In line with previous research approaches, these subtle definitional distinctions will be labeled “eastern” and “western”, as one construct is influenced by the

meditative traditions of Asian cultures while the other is influenced by the cognitive and social sciences of western scholarship. The "eastern" approach, rooted in the contemplative traditions of meditation (Buddhism, Hinduism, etc.), focuses on individual attention and awareness nested within non-reactive, non-judgmental experience (Kabat-Zinn, 2003). Although these traditions have a rich history of meditative scholarship and training, this dissertation focuses on non-meditative, general mindfulness at work instead of traditional religious or meditative approaches to focus on a broader population. The "western" conceptualization of mindfulness is one of rational, thoughtful, active problem-solving, where an individual summons the most effort possible (Langer, 1989). Akin to the non-judgement of the "eastern" approach, the "western" definition is non-reactive in its state of mind. Despite differences in these two conceptualizations that will be explored further below, these approaches share the core notions of attention, awareness, and regulation of one's behaviour. In the 'eastern" approach one's experience is meant to exist as it is without alteration. In the "western" approach, appreciating what is means doing something to make things better and increase good decision-making and judgment. Although often considered separately, perhaps these two approaches to mindfulness, when applied, are more related than previously thought.

When considered in the workplace, mindfulness can apply to how attentive, aware, and non-reactive an employee is when engaging in the job and its demands. A comprehensive discussion of mindfulness, its mechanisms, and current research on its application in the workplace is included in Chapter 2. The real focus of this research effort was mindfulness at work, which can be considered in several domains. A task-based mindfulness, or how attentive and aware and employee is, would be relevant for

employee performance, communication, well-being, motivation, and creativity, as outlined in the literature in Chapter 2. Additionally, any workplace would have social interactions, so interactional mindfulness is also important for communication and relationship quality. Including interactional mindfulness as part of mindfulness at work is a unique contribution of this research, as very few studies in the work-related disciplines, or any disciplines for that matter, have empirically considered a socially informed mindfulness in human interactions (Sable, 2012). Lastly, this research integrates collective mindfulness, or how mindful a group acts overall. The type of collective mindfulness used for the MaW is known as organizational mindfulness (Ray, Baker, & Plowman, 2011). Organizational mindfulness is related to high reliability organizations (Weick, Sutcliffe, & Obstfeld, 1999), or organizations that make decisions according to the "western" mindfulness principles of reason, thoughtfulness, and discernment.

Towards an Integrated Multi-level Theory of Mindfulness at Work

Drawing on the influential work of previous multi-level researchers (House, Rousseau, & Thomas-Hunt, 1995; K. J. Klein & Kozlowski, 2000), this dissertation attempts to integrate individual and collective mindfulness constructs in the form of task-based, relational, and general organizational mindfulness (see Figure 1). The integrative approach of this dissertation considered how individual and collective mindfulness impact each other. As organizational mindfulness is an organization-level construct, it was expected that organizational mindfulness would impact individual mindfulness. As individual behaviour shapes organizational behaviour, it was also believe that task-based and interpersonal mindfulness would lead to greater organizational mindfulness.

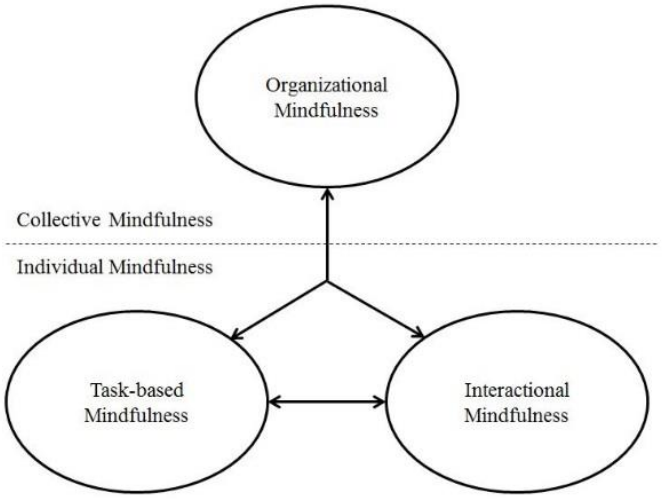

Figure 1. Theoretical model of individual and collective mindfulness at work.

According to multi-level theory, any collective construct like the workplace should be shaped by organizational practices as well as individual employee behaviours and interactions (Morgeson & Hofmann, 1999). At the individual level, and employee can experience mindfulness of the specific job and its task (task-based mindfulness). The employee can also experience mindful social interactions (interactional mindfulness). According to multi-level theory, higher levels of both of these types of individual mindfulness at work should contribute to greater collective mindfulness, and vice versa. These processes of individual and collective mindfulness are often studied separately, and have slightly different theoretical foundations due to the perceived "eastern" vs. "western" mindfulness divide. Therefore, *there is need for a more direct and contextual measure of mindfulness at work that integrates individual mindfulness at with collective mindfulness at work.*

Far fewer measures exist that tap into collective mindfulness than individual mindfulness, as most studies of organizational mindfulness have been qualitative in nature (Sutcliffe, Vogus, & Dane, 2016). A recent measure based on a "western"

conceptualization captured collective mindfulness in the form of organizational mindfulness (Ray et al., 2011). However, this measure's complexity (five factors) and length (42 items) limits its practicality and it has received minimal empirical validation. The Safety Organizing Scale (SOS, Vogus & Sutcliffe, 2007) has been suggested as a possible measure for collective mindfulness as it taps into the complex, five-factor structure of the organizational mindfulness measure. However, the SOS targets safety behaviour, which is only relevant to a handful of important, but specific, industries. Therefore, *there is a need for a general and practical unidimensional measure of collective mindfulness*.

Additionally, because of the importance of relationships and interactions at work, the current conceptualizations and existing measurement tools for mindfulness at work need to some include some form of *interactional mindfulness*, or the attention and awareness necessary for a direct social interaction with a coworker or a boss. The quality of interactions at work are important, and mindfulness can help cultivate stronger communication and interactions (Burgoon, Berger, & Waldron, 2000). Previous research has found that quality interactions can contribute to greater feelings of trust among employees (Rousseau, Sitkin, Burt, & Camerer, 1998) and by extension higher levels of citizenship behaviours (Podsakoff, Mackenzie, Paine, & Bachrach, 2000) and higher degrees of customer satisfaction (Guenzi & Pelloni, 2004). Given the importance of interpersonal exchanges on these organizationally relevant outcomes, and the relatively unexplored nature of this construct, *there is a clear need to measure interactional mindfulness given its potential impact within any social system like an organization*.

The Present Studies

Because of these concerns, the primary goal of this dissertation was to develop a simple, concise, non-clinical, non-meditative contextualized measure of mindfulness at work, the Mindfulness at Work scale (MaW). The development process spanned three studies that are outlined in Chapters 3-5. Developed according to the principles of scale development (DeVellis, 2016), the MaW draws on traditional, "eastern" conceptualizations of mindfulness as well as more contemporary, "western" conceptualizations. Specifically, the measure integrates non-judgmental attention and awareness at the individual level of work tasks and interpersonal interactions with organizational mindfulness. This integration was intended to reconcile and clarify what have been traditionally viewed as separate ways of looking at mindfulness into one cohesive whole that is applicable to the workplace. The work also points towards a novel way of conceptualization mindfulness as an applied skill that is helpful in the workplace. This goal was tackled across all three studies of the dissertation process, which will be briefly described below. A secondary goal of the dissertation was to explore how the various conceptualizations of mindfulness at work relate to each other and possibly impact each other. These conceptualizations are often viewed as separate, but the results of the present studies suggest that this approach is not helpful. This goal was explored primarily through the third study. The overall goal of the set of studies was to aid organizational scientists and practitioners in the development, evaluation, and measurement of future mindfulness research and practice within organizations.

Specific theoretical foundations and the underlying mechanisms of mindfulness are discussed in detail in the literature review in Chapter 2. The study was approved by

Saint Mary's University's Research Ethics Board for research involving human participants.

Study 1: Measure Development and Basic Psychometric Analysis. The first study in the series served as the basis for the development of the MaW. The overall approach to measure development across all studies was based on traditional multi-phase scale development approach (DeVellis, 2016). The first phase of this study led to the generation of 75 items that tapped into individual mindfulness through task-based and interactional mindfulness, in addition to several times that focused on general attention and awareness of the workplace. Initial items also captured collective mindfulness through organizational mindfulness. The concept of interactional/social, mindfulness was unique to this study, adding to the complexity of how mindfulness at work can be conceptualized. Individual mindfulness items explored mindfulness of cognitions, affect, and behaviour in the workplace at the level of the individual employee. Items for organizational mindfulness were based on a pre-existing measure of the construct (Ray et al., 2011). After the initial pool was developed, the item pool was sent to subject matter experts (SMEs) of applied mindfulness at work to determine whether or not the item pool had effectively captured the constructs. The item pool was then piloted with a group of SMEs (I-O graduate students). Feedback throughout the item generation process was integrated into the item pool, resulting in 82 items for the final set of items.

200 participants completed a survey containing this final item pool. Initial analyses were completed to narrow down the number of items. Task-based, interactional, and organizational mindfulness were explored as potentially unique constructs that would support three separate dimensions, but exploratory factor analysis reduced task-based and

interactional mindfulness into one dimension. This construct was labeled individual mindfulness at work (IM). Organizational mindfulness (OM) was clearly unidimensional and appeared distinct from IM. This study reduced the item pool to 29 items, with 14 items for IM and 15 items for OM.

Study 2: Confirmatory Factor Analysis and Validation. This study had two purposes. The first goal of the study was to confirm the bi-dimensional nature of the MaW with a confirmatory factor analysis (CFA) for IM and OM using a sample that completed the reduced item pool. The second goal was a validation effort to explore relationships of IM and OM with other constructs relevant to organizational research and outcomes. Structural equation modeling was used for the CFA to determine whether or not the proposed bi-dimensional structure was a good fit. The first CFA for the reduced item pool did not fit well, so the items were further reduced based on exploratory factor analysis. Another CFA was performed on the further reduced pool, and the two-factor structure fit the data well. The second study reduced the items down to 6 items for individual mindfulness and 5 items for organizational mindfulness. The 11-item MaW was then compared to a variety of existing measures for purposes of convergent, discriminant, and possible predictive validation.

Study 3: Cross-lagged Panel Design with Supporting Factor Analysis. The third and final study adopted a longitudinal, cross lagged design (Menard, 1991). Although over 300 participants began the study, after 3 time periods set three weeks apart, the study had 163 participants who completed all three phases. The longitudinal design allows for repeated measurement across time and strengthens the power of the analysis. The study aimed to further support the two factor structure of the MaW while

testing the impact of individual mindfulness on organizational mindfulness and vice versa. The study also explored perceived organizational support and ethical leadership as potential moderators of these effects. As this study was exploratory in nature, several post hoc analyses were performed to better understand how these construct impact each other in the workplace. Figure 2 presents the analytic model for study 3.

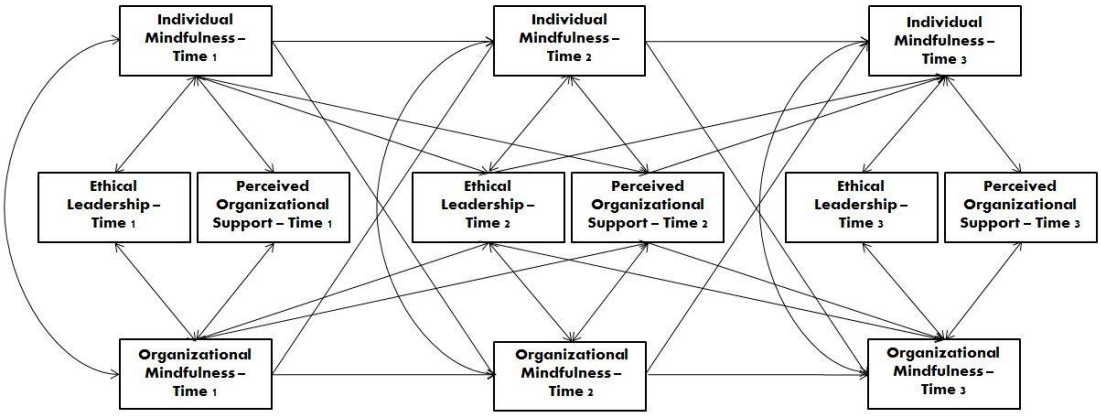

Figure 2. Model for analysis of direct and indirect effects of individual mindfulness and organizational mindfulness with ethical leadership and perceived organizational support as mediators.

Structure of Dissertation Manuscript

Separate introductions, methods, results, and discussions for each of the studies outlined above are presented in Chapters 3-5. A general discussion across all three studies is provided in Chapter 6, including limitations the present studies as well as directions for future research and application of mindfulness at work. In addition to the reference section, comprehensive appendices are included that contain additional information about each stage of the research process.

Chapter 2: Literature Review

Mindfulness Theory

As illustrated in Chapter 1, several conceptualizations of mindfulness exist, and this reality has created challenges in developing a cohesive research paradigm focused on mindfulness at work. Most conceptualizations of mindfulness draw on what can be labeled "eastern" approaches to mindfulness. These mindfulness definitions usually share the common elements of *attention*, or the ability to focus directly on one's experience, and *awareness*, or one's ability to notice what is taking place within his or her experience (Brown & Ryan, 2003). This direct experience is also *non-evaluative* or *non-judgmental* and rooted in the present moment instead of distracted or occupied by thoughts of the past or future (Bishop & Bishop, 2004). Whether mindfulness is viewed as a dispositional trait, a trained skill, or some combination of these two characteristics, the elements of non-judgmental attention and awareness are generally agreed upon across various empirical conceptualizations of mindfulness.

There is also the "western" conceptualization that is more active and involves sensitivity to one's environment, openness to new information, new ways of thinking and acting, and consideration of multiple perspectives (Langer, 1989). The combination of these qualities increases involvement with one's activities and can create a feeling of being in the present moment (Langer & Moldoveanu, 2000). Even though they do not necessarily agree on *non-judgmental* awareness, both conceptualizations overlap in the qualities of attention and awareness. The "western" conceptualization seems to focus on active decision-making and increased effort, while the "eastern" conceptualization describes a state of active and attentive relaxation, but both point towards considered and

non-reactive behaviour. These conceptualizations are seemingly connected, but research rarely considers them side-by-side. A goal of this dissertation was to integrate and consider both "eastern" and "western" conceptualization.

Theoretical orientations aside, active scholars on this topic generally agree that the empirical understanding of mindfulness in the workplace, or what can be called mindfulness at work, is still in a relatively early stage of development, despite its popularity within many organizations. (Dane & Brummel, 2014; Eby et al., 2016; K. C. R. Fox et al., 2014; Good et al., 2016; Hafenbrack, 2017; Sutcliffe et al., 2016). How is mindfulness at work different from or the same as general mindfulness in other life domains? What is the best way to train in mindfulness when work tends to be an active, demanding environment? How should workplace mindfulness be measured given the contextual realities of the work experience? Although scholars are beginning to tackle these questions, it would seem the application of mindfulness at work is outpacing good research around the topic.

Mindfulness as a skill for state activation. The regular activation of the state of mindfulness is easily conceptualized as a skill, or a particular behavior that one enacts. Skills can be trained, cultivated, and developed over time. In the case of mindfulness, this skill of activating open, aware attention is usually cultivated through various mindfulness practices (meditation, yoga, etc.). These practices are rooted in the meditative traditions of Buddhism and Hinduism, wisdom traditions that emphasize non-aggression. This thinking aligns closely with "eastern" approaches to mindfulness, as non-judgmental awareness can limit reactive behavior like aggression. This skills-based approach generally utilizes a form of mindfulness meditation training to aid individuals in

developing non-judgmental attention and awareness. The most conventional approach to mindfulness meditation instructs the individual to notice sensations in the body related to the breath and to focus attention on the somatic experience of the breath process. Through proper training and enough practice, this conscious directing of one's attention can lead to a relaxed state of mind. This relaxed experience has variety of cognitive, emotional, and physiological mechanisms and outcomes. The specific mechanisms of the mindfulness experience, psychologically and physiologically, will be explored in greater detail in below.

The skills-based approach is rooted in a state activation role for mindfulness, where individuals trained in mindfulness can activate a relaxed but alert state grounded in the experience of mindfulness. This state activation can lead to greater attention and awareness in any given moment (Chiesa, Calati, & Serretti, 2011). Although traditional conceptualizations of mindfulness practice have advocated for long periods of mindfulness meditation (1 hour or more), research indicates that state mindfulness can be activated through short, on-the-spot techniques of 5 or 10 minutes. Unlike longer mindfulness practices that require significant time for state activation, shorter techniques can be activated more quickly and could be more appropriate given the demands of a busy workplace (Hafenbrack, 2017; Ostafin & Kassman, 2012). Additionally, it is important to understand what types of work environments promote and sustain activation of the mindfulness state.

Mindfulness as personal trait. In addition to the trainable state-activation skill approach to mindfulness, mindfulness has also been conceptualized as a dispositional trait. Many trait-based approaches to mindfulness assessment exist, and trait-based

measures attempt to capture the overall degree that individuals feel mindful in their daily experience (Baer et al., 2006; Brown & Ryan, 2003; Cardaciotto et al., 2008; Chadwick et al., 2008). Work-based studies of the various impacts of mindfulness in organizations tend to utilize a trait-based approach due to their methodological simplicity. State measures require in-the-moment assessment, while trait-based mindfulness assessment tend to be general assessments of overall mindfulness in one's day-to-day experience and can be completed at the leisure of the employee. These trait-based measures employ statements of overall mindfulness as opposed to more moment-to-moment measures of skill utilization and state activation (Choi & Leroy, 2015). Both state-based and trait-based mindfulness assessment will help to understand various aspects of the workplace that promote mindful work and its effects on relevant outcomes.

Developing mindfulness and its strengths. Despite the regular use of trait-based approaches to assessing mindfulness at work in the empirical literature, most approaches to mindfulness training and interventions in the workplace are rooted in state-based stress-response theories. One such foundational theory is the transactional model of stress and coping (Lazarus & Folkman, 1987). According to this theoretical model, individuals are able to process exposure to stressors more effectively and reduce strain if equipped with appropriate coping strategies. In line with this theory, mindfulness techniques generally function as cognitive and emotional coping mechanisms to help individuals manage stress and strain through regulation of emotion and limiting stress appraisals and responses (Creswell & Lindsay, 2014). To aid in this effort, Mindfulness-based Stress Reduction (MBSR) equips participants with the skills to recognize stress responses and cope with them more directly through reasoned responses instead of

unconscious reactions (Kabat-Zinn, 1990; Kabat-Zinn, 2003). Similarly, Mindfulness-based Cognitive Therapy (MBCT) applies mindfulness skills to help individuals with chronic mental health issues recognize the relationship between psychosomatic and cognitive processes and effectively cut the loop of negative mental states like depression and anxiety through actively reshaping cognitive processes (Teasdale, Segal, & Williams, 1995). While these approaches are grounded in theory relevant to workplace issues like stress, health, and well-being, they are similarly rooted in clinical psychology and its applications. As workplace research tends to focus on non-clinical, general population individuals, non-clinical measures and training approaches could be more useful and more valid to organizationally relevant questions about the workplace.

Despite a need for non-clinical, work-based approaches to mindfulness at work, these clinical approaches are not without their evidence-based merits. A wide range of studies have explored how mindfulness-based clinical practices like MBCT and MBSR can help reduce key physical and psychological health outcomes like stress, anxiety, depression, physical illness, mental disorders, and chronic health problems (Chiesa et al., 2011; Cramer, Lauche, Paul, & Dobos, 2012; Hofmann, Sawyer, Witt, & Oh, 2010; Piet & Hougaard, 2011). Given these empirically-supported benefits, it is not surprising that many organizations are interested in mindfulness for its potential benefits to employee well-being and by extension organizational performance and effectiveness. However, these questions remain: what is the *best* way to develop mindfulness at work to harness these benefits and what is the most *valid* way to assess how these benefits operate in a work context?

The Role of Industrial-Organizational Psychology in Mindfulness Research

Due to the growing interest in mindfulness applications in the workplace, one would think that research into the specifics of mindfulness in the workplace would be well established. However, scholars argue that evidence-based understanding of mindfulness at work is still in a relatively nascent stage. Despite thousands of published articles in psychology around mindfulness and thousands of books on the benefits and applications of mindfulness (Glomb, Duffy, Bono, & Yang, 2011), the empirical investigation of Industrial-Organizational (I-O) Psychologists into mindfulness at work is far from widespread. A search of "mindfulness" in one of the top I-O psychology journals, *Journal of Applied Psychology,* over the last decade (2008-2018) reveals only four empirical articles, two of which have the same first author (Hülsheger et al., 2014; Hülsheger, Alberts, Feinholdt, & Lang, 2013; Liang et al., 2017; Long & Christian, 2015). When completed, studies emerging from I-O and other work related disciplines tend to use a trait-based mindfulness measurement tool (Mindful Attention and Awareness Scale, Brown & Ryan, 2003) that has been criticized for negative wording. Also, there is always need for measurements that are contextualized to the workplace (Rousseau & Fried, 2001). The difference between state and trait mindfulness will be discussed further below.

In short, there is an emerging need for more research and better measures to help explain the mechanisms of mindfulness at work. More details around mindfulness at work, its potential benefits for employees and organizations, and how to approach training modalities to this unique problem are explained later in this text. However, to fully understand how mindfulness can operate in the workplace, it is helpful to

understand the core research around the mechanisms of mindfulness itself. Understanding these core mechanisms sets the stage for a deeper exploration of mindfulness at work.

Mindfulness Processes

Given the benefits of mindfulness explored in the clinical sciences, many researchers have empirically examined the various psychological and behavioural processes that serve as contributing factors to these various positive outcomes. As mindfulness has a millennia-old history of being a path to well-being, empirical support for what was once considered "new age", "spiritual", or even pseudoscience is still relatively new in light of the overall timespan that humans have practiced mindfulness. The term "mindfulness" in and of itself has been useful for this process, and this label removes the spiritual or religious implications of words like meditation, contemplation, and the cultivation of compassion. The combination of rigorous mindfulness research from the cognitive sciences as well as the "hard" sciences (neurophysiology, neuroscience, neuroendocrinology, etc.) has helped to drive mindfulness into the mainstream and has garnered an increasingly widespread and secular appreciation of the term. Studies indicate that both mindfulness skills developed through mindfulness practices and dispositional, trait-based mindfulness can lead to changes in an individual's cognitive processes, emotional functioning, and physiology. Although the quantity of research around antecedents to mindfulness continues to grow, enough studies describe the actual mechanisms that underlie the mindfulness process to justify its continued empirical investigation in the cognitive, behavioural, and organizational sciences, as well as the social and health sciences in general.

Attention. One of the core domains where mindfulness has an immediate impact on the state of human experience is in the realm of attention. As attention is a core domain of human functioning, research suggests that the mindfulness state can contribute to more sustained attention to one's experience. Many studies have established a clear link between mindfulness and reduced mind wandering along with increased executive attention (Hasenkamp, Wilson-Mendenhall, Duncan, & Barsalou, 2012; Lutz, Slagter, Dunne, & Davidson, 2008; Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). This increase of attention and reduction of distraction leads to more active open monitoring of one's experience, and can foster the ability to switch one's attention at will. This finding is unsurprising as the focus of mindfulness training often involves redirecting one's attention from a distraction or a preoccupying thought to one's immediate sensory experience in the form of the breath.

This increase in the capacity to redirect attention is often referred to as attentional control. As a result of this increased attentional flexibility and control, the mindfulness state allows for increased awareness of the full range of the human sensory and cognitive experience (Raffone & Srinivasan, 2010). When one's mind is less distracted and able to attend directly to an aspect of experience at will, one can be more aware of the totality of one's perceptual, cognitive, and emotional experience. This increase of awareness can lead to more accurate assessments of the environment and, by extension, more appropriate cognitive, emotional, and behavioural responses to what is occurring in the environment. Appropriate responses lead to greater attentional efficiency, allowing mindful individuals to attend more directly to immediately relevant information instead of irrelevant or distracting information (Neubauer & Fink, 2009). Research indicates that

mindfulness practices positively impact attentional efficiency through increased attentional control, resulting in less wasted cognitive resources and more immediate detection of new and relevant stimuli (Slagter et al., 2007). The efficient use of cognitive resources has significant benefits to cognitive processes, as described below. Unsurprisingly, individuals who engage in regular mindfulness practice like meditation or other techniques report less effort needed to maintain and cultivate attention and awareness (Tang, Hölzel, & Posner, 2015), suggesting the link between state mindfulness training and dispositional trait mindfulness. As the successful completion of any work task requires sustained attention, the potential benefits of mindfulness at work for employee attention and by extension performance are ripe for further exploration.

Cognition. Mindfulness practices have also been shown to increase various cognitive processes relevant to improved human functioning in cognitive domains beyond attention and awareness. Studies indicate that mindfulness-based interventions can increase working memory capacity (Mrazek et al., 2013; Roeser et al., 2013). Although linked to attention, working memory is described as the overall ability of an individual to hold multiple items in the memory system without falling prey to distractions or disturbances (Turner & Engle, 1986). Further supporting the importance of mindfulness as a skill, research has shown that ongoing mindfulness practice, not just short-term practice, is required to maintain the positive effects that mindfulness has on working memory capacity (Jha, Stanley, Kiyonaga, Wong, & Gelfand, 2010). Clearly, regular mindfulness state activation through meditation or some other technique is very important for mindfulness to have a lasting impact on memory capacity. However, trait-based mindfulness has also been linked to greater working memory capacity independent

of mindfulness training and when controlling for general intellectual ability (Ruocco & Direkoglu, 2013), further suggesting that both trait and state mindfulness contribute to the overall benefits of mindfulness. Beyond basic memory capacity, mindfulness has also been shown to impact memory quality. It has been shown that mindfulness practices can increase the memory of positive experiences in particular (Alberts & Thewissen, 2011). These findings suggest a link between the impact on positive memory processes and the positive well-being outcomes described above.

Additional studies have explored the role of mindfulness in promoting cognitive flexibility, or cognitive adaptation based on creative and unique perceptions and thoughts (Walsh, 1995). Some studies have linked mindfulness experiences with increased creativity and novel thinking (Baas, Nevicka, & Ten Velden, 2014; Capurso, Fabbro, & Crescentini, 2014; Colzato, Szapora, & Hommel, 2012), although recent meta-analytic findings suggest that the link between mindfulness and creativity is relatively weak (Lebuda, Zabelina, & Karwowski, 2016). Other explorations have established some evidence of the link between mindfulness and stronger problem solving outcomes (Ding et al., 2014; Grepmair et al., 2007; Ostafin & Kassman, 2012). Although the findings are somewhat mixed, the link between mindfulness and cognitive flexibility in some capacity is worth further investigation. As many organizations value creativity, problem solving, and the ability to learn, the potential cognitive benefits of mindfulness at work are clear.

Emotion. Mindfulness has also been shown to have positive effects on individuals' emotional, or affective, state. One of the results of mindfulness practice is an increase of self-regulatory capacity, or one's ability to have greater control over mental processes, such as emotion (Baumeister, Heatherton, & Tice, 1994). Because of

this increase in self-regulatory capacity, mindfulness has been linked with reduced emotional reactivity resulting from an increase in self-generated emotional regulation (Glomb et al., 2011; Long & Christian, 2015; Masicampo & Baumeister, 2007).

This increase in emotional regulation helps individuals to limit emotional reactivity and express greater emotional control. Because of these benefits, mindfulness has been shown to damper negative affective responses to situations perceived as stressful or somehow threatening. By extension, research indicates that mindfulness can help individuals to recover from a negative emotional state and reach a more positive state more quickly (Garland, Gaylord, & Park, 2009; Keng, Robins, Smoski, Dagenbach, & Leary, 2013), a finding that has contributed to the interest in studying the connection between mindfulness and resiliency.

Additionally, mindful individuals are able to do more with their emotions than just shift from negative to positive affect. Recent meta-analytic findings seem to suggest that individuals who engage in mindfulness practices overall place more value in and generally experience a more positive and less negative emotional landscape (Sedlmeier et al., 2012). Interestingly, some research suggests that mindfulness not only limits reactivity to negative situations, but can also limit emotional reactivity to positive situations (Brown, Goodman, & Inzlicht, 2012; Desbordes et al., 2012; Teper, Segal, & Inzlicht, 2013). These findings suggest a more balanced process of emotional regulation among individuals who practice or are dispositionally prone to mindfulness that includes both negative and positive affective experiences. As the workplace can often be stressful, frustrating, and emotionally challenging, the emotional regulation capacity resulting from mindfulness is particularly relevant for understanding mindfulness at work.

Behaviour. The self-regulatory impacts of mindfulness can also lead to changes in an individual's behaviour. Not only does self-regulation improve emotional regulation, it has also been linked to reduced automaticity in behavioural domains. Mindfulness has been shown to reduce discriminatory behaviours rooted in age and race (Lueke & Gibson, 2015). Mindful parents have also reported less automated retaliatory behaviour when dealing with unruly children (Coatsworth, Duncan, Greenberg, & Nix, 2010; Dumas, 2005). The self-regulation benefits of mindfulness has also been shown to be helpful for individuals with addictions. Studies indicate mindfulness can help individuals reduce smoking and help manage cravings for nicotine when trying to quit (Elwafi, Witkiewitz, Mallik, Thornhill, & Brewer, 2013; Westbrook et al., 2011). Similar efforts have established a clear link between recovery from substance abuse and mindfulness practices (Vidrine et al., 2016; Witkiewitz, Marlatt, & Walker, 2005). Given the regular goal of changing employee behavior through improving performance, safety compliance, training transfer, and so on, the implications for behaviour change with mindfulness at work are significant.

Neural processes. The attentional, cognitive, emotional, and behavioural processes described above are also supported by a range of studies rooted in neuroscientific and physiological methodologies. The electroencephalograph, or EEG, has been widely used for many studies on the neurophysiological correlates of the mindfulness experience due to its accessibility and non-invasive nature (Lomas, Ivtzan, & Fu, 2015). A well-established experience that occurs as the result of mindfulness is a state of "relaxed alertness", and researchers have linked this state with EEG activity characterized by increased theta amplitude and increased alpha brain activity in the

frontal (Takahashi et al., 2005) and posterior (Cahn, Delorme, & Polich, 2010; Lagopoulos et al., 2009) regions of the brain. This theta and alpha activity leads to event-related synchronization (Fell, Axmacher, & Haupt, 2010), which acts as a neurophysiological correlate to attentional processing (Shaw, 1996), providing physiological parallels to the attentional benefits of mindfulness. Similarly, research points to a reduction in overall brain activation needed for directed attention among regular mindfulness practitioners (Kozasa et al., 2012). Despite these findings, studies also indicate that different mindfulness techniques can have differential neurological responses, suggesting that some techniques are more effective at eliciting certain brain states than others (Hinterberger, Schmidt, Kamei, & Walach, 2014).

Research also indicates that these various forms of brain activation are not simply temporary states. Regular practice of mindfulness has also been linked to lasting changes in neural physiology. Studies have reported positive changes in grey and white brain matter density (Hölzel et al., 2011) and overall cortical thickness (Kang et al., 2012) resulting from regular mindfulness practice. Recent meta-analytic findings suggest a moderate effect of mindfulness practices on changes in the frontopolar cortex, sensory cortex, the hippocampus, the anterior cingulate cortex, mid-cingulate cortex, orbitofrontal cortex, superior longitudinal fasciculus, and corpus callosum (Fox et al., 2014). These neurophysiological findings establish a clear relationship between the psychological and behavioural effects of mindfulness described above and an individual's neural functionality. Although more distal than other mindfulness processes, the implications for brain functions like attention, learning, and neural longevity are relevant questions when thinking about the long-term benefits of mindfulness at work.

Hormones. Mindfulness has also been shown to have a significant impact on neuroendocrinological processes linked to relevant psychological and behavioural outcomes. Most of these impacts are linked to greater regulation of stress hormones like cortisol and norepinephrine (Brand, Holsboer-Trachsler, Naranjo, & Schmidt, 2012; Lazar, 2014). However, on an interpersonal level, studies indicate that mindfulness can help reduce the endocrine system's normal stress response in social situations that are perceived as either threatening or stressful (Brown, Weinstein, & Creswell, 2012; Creswell, Pacilio, Lindsay, & Brown, 2014). Because of the potential impact of stress hormones on heart health, musculoskeletal health, and other negative health outcomes, there is a clear link between mindfulness practices and reduced chronic health issues. As employee health is a meaningful topic for organizational ethics and responsibility, mindfulness at work can contribute to healthier neuroendocrinological function among employees.

The State of Research and Practice of Mindfulness at Work

Given the wide-ranging positive benefits of mindfulness and implications for the workplace described above, many organizations are interested in harnessing the potential benefits of mindfulness at work as part of their overall strategy. However, along with the interest in helpful application of mindfulness approaches to the workplace comes a need to describe and assess how mindfulness operates in the workplace specifically and how its various benefits for employees and organizations as a whole are similar and different from established clinical approaches. Because practitioners are focusing on these various workplace applications of mindfulness, organizational scientists need to increase the effectiveness and quantity of empirical research into mindfulness at work. While further

validating the clear health and well-being benefits of mindfulness established by the clinical research, organizational research has begun to suggest that mindfulness can also contribute to organizationally relevant outcomes like stronger performance, improved relationships, and employee engagement (Good et al., 2016; Sutcliffe et al., 2016), among other relevant outcomes. Due to the established attentional, cognitive, emotional, behavioural, and physiological mechanism of mindfulness described above, this assertion is not without merit. Although the list of relevant employee outcomes is likely to grow as researchers continue to explore and better understand mindfulness at work, the following sections provide an overview of the current empirical support for several benefits of mindfulness at work. These studies overall support the strategic decision to emphasize the cultivation and disposition of mindful experience in the workplace.

Occupational health and employee well-being. Echoing the benefits of mindfulness established in the clinical literature, research has established a clear link between mindfulness and occupational health outcomes for employees. A recent systematic review presented the overall positive effects of mindfulness at work interventions on anxiety, depression, distress, anger, general health, well-being, and stress across a wide range of studies representing a similarly wide range of industries (Lomas et al., 2017), even though a few studies found no or negative effects. Other reviews of the outcomes of mindfulness at work have made similarly strong arguments for the positive impact of mindfulness on employee well-being (Good et al., 2016; Sutcliffe et al., 2016). Not only has mindfulness consistently led to positive effects across these domains, mindfulness has also been shown to reduce work-related burnout symptoms like emotional exhaustion and improve feelings of satisfaction, both of which can contribute

to well-being (Hülsheger et al., 2013). Trait mindfulness has been linked to engagement, which is often conceptualized as the opposite of burnout, suggesting that dispositionally mindful employees are more likely to engage in work in a positive and healthy way (Leroy et al., 2013; Marzuq & Drach-Zahavy, 2012). Mindfulness has also been identified as a contributor to greater work/life balance (Michel, Bosch, & Rexroth, 2014) and improved sleep quality (Hülsheger et al., 2014).

Performance. In addition to these clear health and well-being outcomes, studies point towards a potential link between mindfulness employee performance and possibly even organizational performance. Contingency theory suggests that the improvements to employee attention can have a significant impact on task performance among mindful employees (Dane, 2011). Part of the benefits of attention could be an increased awareness of and ability to work with a wandering mind when completing work tasks, leading to more consistent, stable performance over time (Chiesa, 2013; Mrazek et al., 2013). Reflecting the cognitive mindfulness discussed above, mindful employees display greater creativity and problem solving based on cognitive flexibility (Baas et al., 2014; Ostafin & Kassman, 2012). Problem solving is often an essential component of performance, particularly in more complex and intellectually driven roles. Mindfulness has also been linked to indirect measures of performance in the form of helping behaviours, or organizational citizenship behaviours (Reb, Sim, Chintakananda, & Bhave, 2015). Although mindfulness is likely to benefit the performance of most employees in some capacity given the mechanisms at play, employees in roles that are very complex, dynamic, and changing appear to benefit the most from mindfulness (Dane & Brummel, 2014; Zhang, Ding, Li, & Wu, 2013).

Collective mindfulness. Even though these studies present some tantalizing findings, the direct links between mindfulness and employee performance are not as clear as the impacts mindfulness training and dispositional mindfulness can have on employee well-being. However, these potential benefits to individual employee task performance can also be extended to higher levels of an organizational system. As individual employees are part of ever increasing levels of social organization, from work groups, to departments, to regions, to whole organizations, and so on, individual mindfulness could contribute to improvements in social exchanges and relationships as well as increased organizational performance. Greater levels of mindfulness among employees can contribute to a sense of what can be labeled "collective mindfulness".

In line with the "western" conceptualization of mindfulness, groups can be more mindful in decision-making behaviour. This more contemporary definition has led to the concept on the part of many organizational scholars of *collective mindfulness.* Collective mindfulness as a construct operates socially and interpersonally and describes attention and present moment awareness in relation to shared work roles and responsibilities (Weick & Putnam, 2006). More in line with creativity and problem solving, this recent conceptualization has been linked to key organizational outcomes like lower turnover (Vogus, Cooil, Sitterding, & Everett, 2014), increased customer satisfaction (Ndubisi, 2012), effective use of resources (Wilson, Talsma, & Martyn, 2011), and innovation (Vogus & Welbourne, 2003). Collective mindfulness has also been linked to less errors in high-risk industries like nursing and medicine (Ausserhofer et al., 2013; Hales, Kroes, Chen, & David Kang, 2012; Vogus & Sutcliffe, 2007). These connections link the construct of collective mindfulness with high reliability organizations (HROs), or

organizations that pride themselves on responsive, reliable performance (Weick et al., 1999).

Antecedent contextual factors to mindfulness at work. Although existing research illustrates the importance of collective mindfulness to relevant organizational outcomes and scholars have long-implored greater attention to it as a relevant construct for mindfulness at work (Argote, 2006), good research into the development of collective mindfulness is still scarce. However, several key antecedents have been empirically identified that contribute to its development. Two core environmental antecedents of collective mindfulness are effective leadership and organizational practices (Reb et al., 2015; Sutcliffe et al., 2016). Authentic leadership is often discussed as amenable to mindfulness because of its focus on the self-awareness of leaders along with their balanced processing and more genuine relationships (Walumbwa & Schaubroeck, 2009). As authentic leaders tend to be more mindful themselves, they should also be able to develop this capacity in others and through increasing the mindfulness in others help develop the capacity for greater collective mindfulness. Additionally, authentic leaders can create an environment of clear goals, policies, and procedures that directly contributes to the cultivation of collective mindfulness. Similarly, the presence of ethical leadership in the work environment can promote ethical behaviour and helping, outcomes that are important strategic contributors to notions of organizational performance (Eisenbeiss, Van Knippenberg, & Fahrbach, 2015). Likewise, practices like employee empowerment, proactive socialization, and ongoing training and professional support contribute to collective mindfulness (Knox, Simpson, & Garite, 1999). Given the prevalence in workplaces of automatic, habitual work behaviours, routine skill

implementation, and other obstacles to direct and immediate attention and awareness (Valorinta, 2009), aspects of the work environment that contribute collectively to mindfulness should be considered when applying or researching mindfulness at work.

Mindfulness at work interventions. Given the benefits of mindfulness both at work and in general, organizations are eager to implement mindfulness interventions and training to positively impact employee well-being and performance. As organizations are drawing on existing clinical approaches to mindfulness like Mindfulness-based Stress Reduction and Mindfulness-based Cognitive Therapy, questions arise as to whether or not these are the best interventional approaches for non-clinical populations like an employee base. Any effective training should be contextualized to the workplace and focus on the transfer of work-relevant behaviours to the work environment to be the most relevant, and by extension, impactful (Ford, 2014; Velada, Caetano, Michel, Lyons, & Kavanagh, 2007). However, explorations of the frequency of mindfulness training for employees have shown that only 10-15% of workplace efforts focus on non-clinical, non-meditation-based approaches to learning mindfulness skills (Eby et al., 2016). Despite the well-supported positive benefits of clinical approaches to mindfulness training, many workplaces will not have the resources to invest in long-term interventions like these nor will they necessarily need training with a clinical focus. Although shorter forms have been developed, Mindfulness-based Stress Reduction and Mindfulness-based Cognitive Therapy are usually long-term, multi-week training and clinical paradigms (Bohlmeijer et al., 2010; Kabat-Zinn, 2003). Training and interventions for mindfulness as applied to the day-to-day work experience should be practical, simple, relevant, and non-clinical in nature. Even though the goal of this dissertation was not directly related to exploring

training and intervention methods, this topic is highly relevant when considering the current state of research around mindfulness at work.

Opportunities to Strengthen Empirical Understanding of Mindfulness at Work

Despite the potential benefits of mindfulness at work described above, many leading scholars of mindfulness at work argue that empirical understanding in this domain is still mostly embryonic (Dane & Brummel, 2014; Eby et al., 2016; K. C. R. Fox et al., 2014; Good et al., 2016; Hafenbrack, 2017; Sutcliffe et al., 2016). The obstacles to effective mindfulness research are wide-ranging. Varying conceptualizations of mindfulness, measurement concerns, limited agreement on appropriate research methodologies, and the desire to implement mindfulness interventions without first understanding workplace mindfulness are all hindering the emergence of a cohesive research agenda across the organizational sciences. The eagerness of organizations to get a quick fix through utilizing or modifying existing training methodologies could limit the scope and long-term impact of mindfulness research and interventions in the workplace. The MaW aims to provide a reliable, valid, and practical measure of mindfulness at work to focus future research efforts and strengthen the success of the application of mindfulness efforts in the workplace.

Measuring Mindfulness at Work. To study mindfulness at work effectively, there needs to be a non-clinical, contextualized conceptualization and measurement for workplace mindfulness that captures the elements described above while also capturing the experience of the workplace itself. Attention and awareness are important, but any discussion of mindfulness at work needs to be contextualized to include work-relevant behaviours like individual tasks and interactions along with organizational climate

elements that can promote collective mindfulness. This approach could be considered applied mindfulness at work, a notion that integrates traditional ideas around mindfulness with the more active, Western approach to mindfulness. A contextualized, integrated conceptualization of applied mindfulness at work with accompanying measurement tool will allow future researchers and practitioners to more directly capture various aspects of mindfulness at work and assess the impact of workplace mindfulness on relevant outcomes like stress, performance, well-being, and others with greater validity. The primary aim of the following set of studies is to do just that.

Task-based mindfulness. Training in mindfulness tends to focus on the physiological experience of the breath as the object of attention. In a work context, however, individual attention is generally focused on the actual work that one is doing as opposed to a passive process like the breath. When doing work tasks, attention falls on one's unique task relevant to one's job and the utilization of one's skills and expertise to complete the task. Mindfulness at work should thus draw on attention to one's individual work tasks while also allowing an attention of the working environment. This approach maintains the integrity of the attention and awareness of the traditional mindfulness construct while contextualizing the object of attention to active work-related behaviours.

Relational/interactional mindfulness. Another important consideration when conceptualizing applied mindfulness at work that needs to be taken into account is the quality of mindfulness in relationship to others, like coworkers, bosses, supervisors, clients/customers, etc. Some scholars argue that understanding interactional mindfulness at work is an important next step in understanding how mindfulness operates in the workplace (Good et al., 2016), Given the importance of quality relationships for strong

communication and collaboration within any workplace (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000), it is important to take into account mindful interactions when discussing applied mindfulness at work. Previous research has shown that mindfulness can lead to greater awareness of others, more effective listening, and stronger relationships between coworkers (Beckman et al., 2012; Reb et al., 2015). In addition, although not directly work-related, ample research has explored how mindfulness can positively impact relationship quality, empathy, and emotional reactivity within intimate relationships (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007; Carson, Carson, Gil, & Baucom, 2006; Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008; Quaglia, Goodman, & Brown, 2015). Some scholars from a "western" point of view argue that the deliberate and rational activity resulting from mindfulness can have a significant impact on effective communication processes across the entire work system (Burgoon et al., 2000). Given the importance of relationships to the workplace and the evident impact of mindfulness on relationship and communication quality, a conceptualization of applied mindfulness at work needs to contain mindful interactions.

Collective/organizational mindfulness. As discussed above, research into the various organizational factors that may impact mindfulness at work is still in the early stages of development (Sutcliffe et al., 2016). One emergent interpretation and measurement approach of collective mindfulness that has recently received some attention in the literature is *organizational mindfulness* (OM, Ray, Baker, & Plowman, 2011). Following Langer's research, this conceptualization contains five factors of organizational mindfulness as they relate to specific organizational practices. The first factor is *reluctance to simplify*, characterized by actively seeking out divergent views and

new information. *Sensitivity to operations* involves an overall situational awareness and attention to details. *Commitment to resilience* is the ability to adapt and correct errors quickly and efficiently to limit their harm. *Deference to expertise* involves using the right people regardless of their power or authority within the organization. Lastly, *preoccupation with failure* is a sensitivity to all failures, no matter how small, reflected in the view that all failures should be reported and openly discussed (Langer, 2014; Vogus & Sutcliffe, 2012). Applying these principles should help an organization and its employees to be more mindful of the current organizational state and adapt accordingly, leading to stronger organizational strategy, decision-making, and outcomes. Given the potential benefits of these collective constructs and the apparent benefits of collective mindfulness, organizational mindfulness should be included with any conceptualization of mindfulness at work.

Criticism of the current measurement of mindfulness at work. Some scholars argue that effective organizational research, to be relevant and meaningful, must be contextualized to the realities of the workplace itself (Rousseau & Fried, 2001). Despite the seeming need to execute research with an eye towards context and specific workplace applications and issues, research on mindfulness at work tends to utilize measurement tools that are non-contextualized, particularly at the individual level, and that are often clinical in nature. A wide range of both trait-based and state-based measures are used measuring mindfulness at the individual level based on both "eastern" and "western" perspectives (Five Facet Mindfulness Questionnaire, Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Mindful Attention Awareness Scale, Brown & Ryan, 2003; Philadelphia Mindfulness Scale, Cardaciotto et al., 2008; Toronto Mindfulness Scale, Lau et al.,

2006). However, these measures do not seem adequate for capturing mindfulness at work. Some focus on the meditation experience, others on just general mindfulness, but none on actual work (Buchheld, Grossman, & Walach, 2001; Lau et al., 2006). None of them are specifically tailored to capture the unique qualities and applications of mindfulness to the workplace discussed above (Cardaciotto et al., 2008; Tanay & Bernstein, 2013). Some measures of collective mindfulness do exist, but they are overly long (Organizational Mindfulness, Ray et al., 2011) or focus only on a specific outcome like safety (Safety Organizing Scale, Vogus & Sutcliffe, 2007)

Because of the current state of available mindfulness assessment tools for the workplace, the majority of workplace studies examining mindfulness employ non-contextualized, trait-based measures of basic individual mindfulness (Choi & Leroy, 2015). Trait-based measures are easier to implement and examine in a work context as they do not require momentary state assessment and can be completed at any time. These measures have often been criticized for their negative wording (Sauer et al., 2013). Two of the most common mindfulness measures used for organizational research include the Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003) and the Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006). The MAAS, while being utilitarian for its short length, captures moments of non-mindfulness instead of moments of being attentive, aware, and present-focused. Items like "I forget a person's name almost as soon as I've heard it for the first time", and "I snack without being aware that I am eating", seem to address a lack of attention and awareness, not a presence of them. As a result of this negative wording, the MAAS is often criticized for being a measure of mind*less*ness as opposed to mindfulness (Hölfling,

Moosbrugger, Schermelleh-Engel, & Heidenreich, 2011). The FFMQ also falls prey to the use of reverse-scored, mindlessness items, and is far less utilitarian than the MAAS given its 39-item length when compared to the MAAS's 15-item structure.

In terms of collective mindfulness, the current measure of organizational mindfulness (Ray et al, 2011) is of a questionable length for practical use within organizations, as it sits at 43 total items. Also, as the following studies will establish, this measure of organizational mindfulness, while proposing a five-dimension structure, generally behaves as a single factor, suggesting that this number of items and dimensions is far from necessary. Another measure of collective mindfulness, the Safety Organizing Scale (Vogus & Sutcliffe, 2007), works well for high-demand situations where safety is key, but might not be relevant to a more general working population. Because a measure of applied mindfulness at work should be practical, simple, and contextual, a short, general measure of collective mindfulness is needed.

Chapter 3: Study 1 - Measure Development and Basic Psychometric Analysis

Study one focused on developing a short, practical measure of mindfulness at work that integrated task-based, interactional, and organizational mindfulness. This process was carried out according to recognized recommendations for scale development theory and application (DeVellis, 2016).

Theoretical Basis for Initial MaW Items

Using previous measures as a foundation (Baer et al., 2008; Brown & Ryan, 2003; Cardaciotto et al., 2008; Lau et al., 2006; Ray et al., 2011), the initial item pool for the Mindfulness at Work (MaW) scale attempted to capture several dimensions of applied mindfulness in a work context. Specifically, the measure aimed to capture workplace mindfulness experiences in relation to general mindfulness, individual task completion at work, interpersonal/social exchanges at work, as well as organizational mindfulness. In line with the proposed integrated theory of mindfulness at work, general mindfulness, task-based mindfulness, and workplace interactions occur at the level of individual behavior, cognition, and affect, while organizational mindfulness acts as an organizational-level construct that taps into a particular collective mindfulness dimension present in the organizational climate. The initial proposition of this project suggested that task-based, interactional, and organizational mindfulness at work would psychometrically behave as three distinct factors given that they operate at micro-, meso-, and macro-levels (individual tasks, interpersonal, and organizational) and theoretically should operate on variations of cognitive, affective, and behavioral forms of mindfulness. However, as explained below, these initial three domains were reduced through analysis down to two factors: individual mindfulness, containing both the proposed task-based and interactional

mindfulness, along with organizational mindfulness. Results for a three-factor (task-based, interactional, and organizational mindfulness) and 2-factor structure (individual and organizational mindfulness) are described in the following analysis and results, even though the 2 factor model was retained for the next study in the series.

Several research concerns contributed to focusing on these three aspects (task-based, interactional, and organizational mindfulness). Task-based mindfulness could be relevant for individual job performance and could impact employee health, safety, and many other possible outcomes. The interactional aspect was a unique contribution to the theory of mindfulness at work as this quality of mindfulness has not been explored directly in any context, particularly a work context where interactions and exchanges are so important for success. Finally, the organizational mindfulness measure was based on previous work in this field and was intended to provide a unidimensional measure of organizational mindfulness, a unique contribution when compared to other measures that are either multidimensional and cumbersome for practical use (Organizational mindfulness scale, Ray, Baker, & Plowman, 2011) or are overly focused on health and safety (Safety Organizing Scale, SOS, Vogus & Sutcliffe, 2007).

Method

Item Pool Generation

The items generated during the initial phase of development for the MaW attempted to capture several distinct aspects of mindfulness across these three dimensions. Some items attempted to capture general attention (e.g. “I am able to pay direct attention to my work”) and overall situational awareness (e.g. “I notice the environment I am working in”) in the workplace. For task-based mindfulness, items

were generated that targeted attention and awareness in several specific experiential domains when engaging in task completion and standard job behaviour. These items targeted the awareness of specific aspects of an employee's experience that they could relate to mindfully when completing specific tasks. These items focused on somatic awareness (e.g. "I pay attention to how I sit or stand when working"), awareness of thoughts/cognitions (e.g. "When working, I experience my thoughts clearly"), and awareness of affect/emotions/feelings (e.g. "When doing a work activity, I experience my feelings and emotions") while engaging in task-based behaviours. The items generated from these three experiential domains (somatosensory, cognitive, and affective awareness) attempted to capture the diversity of human experience, ranging from basic somatosensory experience to direct experience of thoughts and feelings at work. These three "types" of mindfulness were then applied to interactions at work and used similar language as the individual mindfulness items to capture the quality of interactional mindfulness. 25 items were generated for both task-based mindfulness and interactional mindfulness for a total of 50 items.

Items for organizational mindfulness were generated from a different theoretical standpoint. Organizational mindfulness is based on an "active" conceptualization of mindfulness, as opposed to the nonjudgmental, "passive" mindful awareness that is often the foundation for mindfulness conceptualizations (Langer, 1989). In particular, scholars have established organizational mindfulness as a construct that consists of five dimensions of high-reliability organizations, or adaptive organizations: Reluctance to Simplify (RS), Sensitivity to Operations (SO), Commitment to Resilience (CR), Deference to Expertise (DE), and Preoccupation with Failure (PF) (Ray et al., 2011;

Weick et al., 1999). As this conceptualization focuses on organizational mindfulness, items aimed at capturing this dimension needed to be framed very differently from the task-based and interactional mindfulness items. A list of 5 items were generated for each of the five proposed dimensions of mindful organizations (i.e. "My workplace attends to problems directly" and "My workplace values analysis and understanding"), leading to 25 total items for organizational mindfulness, and 75 items in total for the item pool (Appendix A).

SME Feedback and Pilot Study

The initial item pool of 75 items was sent to subject matter experts (SMEs) in mindfulness. Feedback was requested from those who identified as academic/research SMEs as well as those who identified as SMEs with an emphasis on application and practice. Responses to the items were received from 4 practitioners and 5 researchers. Several practitioners were self-identified as teachers of social mindfulness and social meditation, an emergent form of mindfulness practice that emphasizes social interactions as the basis for the mindfulness practice. Collecting feedback from these individuals was especially relevant given the inclusion of interactional mindfulness in the MaW item pool. Feedback was generally positive, particularly from practitioner SMEs, but several suggestions were made. Item-level suggestions were integrated into the initial item pool to change wording and language to improve clarity, while broader suggestions about additions to the item pool helped shape some new items and clarify potential measures for the follow-up study examining convergent/discriminant validity. Specific suggestions included distinguishing between self and other during interactions as well as suggestions to distinguish the measure from other measures helped shape the formation of new items.

This process led to the addition of two items for interactional mindfulness and two items for organizational mindfulness, resulting in 79 total items.

The next phase of development for the item pool involved a pilot study with 4 SMEs in psychological measurement (graduate students in Industrial-Organizational Psychology). This process had the SMEs go through the items in random order, identify them as individual task, social, or organizational mindfulness according to definitions, and provide written comments on any issues with item and construct clarity. The pilot participants then spent time explaining their feedback to the researcher. This feedback was collected and considered for further item refinement. Feedback with item level edits is included in Appendix B. Some item-level concerns expressed during the pilot led to the alteration of the wording of these items. The use of the term "members" in organizational mindfulness was replaced with "workplace" for consistency in referring to the organization itself and not its members. Questions were also raised about the nature of individual performance as a construct, so this construct label was clarified as *task-based mindfulness* at this stage of the process. Of particular note was the feedback provided on the construct of interactional mindfulness. Some items did not specify whether or not this social mindfulness experience occurred before or after interacting or during interactions. As these items were intended to capture an overall assessment of an individual's mindfulness during the actual interaction, items tapping interactional mindfulness were clarified with language that specified in-the-moment interactions (e. g. "When interacting with…" or "When talking with…"). This dimension was also relabeled *interactional mindfulness* at this stage in the process, as this idea was previously labeled social/interpersonal mindfulness. This relabeling maintained the

intention of these items while clarifying the construct as an interactional process instead of simply being a social or interpersonal one. Other questions arose about the nature of organizational mindfulness and its relationship with employees' feeling supported by coworkers both emotionally and in work-related tasks. Three items were added to the organizational mindfulness items that considered these feelings of support from others, resulting in 30 items for this construct, for a total of 82 items for the final item pool (Appendix C).

Participants for Initial Psychometric Analysis

To analyze the behaviour of the finalized item pool, data were collected from participants from Amazon's MTurk worker pool. MTurk is a reliable and helpful tool for social science researchers that are looking for participants quickly and efficiently (Buhrmester, Kwang, & Gosling, 2011). Additionally, the researchers chose to use this pool over a traditional undergraduate population as individuals in the MTurk pool tend to be older than most undergraduate psychology students and thus have more relevant work experience. This additional age and experience was important given the work-based nature of the MaW item pool. MTurk workers were compensated at the rate of 10 cents CAD/minute. As the item pool was expected to take 15 minutes to complete, participants received $1.50 CAD (converted to $1.20 USD) for their participation. In accordance with ethical guidelines for participation in psychological research, all participant information was kept anonymous through the use of TurkPrime, a 3rd party research toolkit that anonymizes any identifying information. As workers can be personally identified through their MTurk ID, TurkPrime removes this ID and replaces it with a unique identifier provided through the service (Litman, Robinson, & Abberbock, 2017).

To be eligible to participate, participants needed to have worked at least a part-time job at some point in the past six months where they regularly interacted with others. To maintain the quality of the data, completed responses that were finished in less than five minutes were discarded. Additionally, the survey design used an attention check question ("To confirm that you are paying attention, please select never as a response to the right."). Responses from participants who failed the attention check question were also discarded. A total of 273 MTurk workers were compensated for their work in order to reach a total number of 200 participants who met these established criteria. This attrition rate (27%) was around average based on previous researchers' experiences using MTurk when using attention checks and time to completion for quality assurance (Zhou & Fishbach, 2016). Based on this attrition, studies 2 and 3 used workers with more experience and higher ratings for in an effort to retain more participants.

Participants provided demographic information on age, biological sex, race, ethnicity, full-time/part-time employment, industry, and hours worked per week. In addition, participants were asked to identify whether or not they actively practiced any form of mindfulness (meditation, yoga, etc.). Demographic information is provided in Table 1. The MTurk worker pool, as expected, included a diverse range of professional backgrounds and industries. The top five industries represented were education, healthcare, sales, manufacturing, and IT.

Table 1

Demographic Characteristics of Participants for the Basic Psychometric Study

Age	*n*	%
20-24	24	12.0%
25-29	44	21.6%
30-34	53	26.0%
35-39	24	11.8%
40-44	20	9.8%
45-49	11	5.4%
50-54	12	5.9%
55-59	7	3.4%
60+	5	2.5%

Sex	*n*	%
Female	78	39.0%
Male	122	61.0%

Race	*n*	%
Asian	14	7.0%
Black	15	7.5%
Two or more races	5	2.5%
White	165	82.5%

Ethnicity	*n*	%
Hispanic	14	7.0%
Non-Hispanic	185	92.5%

Full time/Part time	*n*	%
Full-time	171	85.5%
Part-time	28	14.0%

Mindfulness practice	*n*	%
No	138	69.0%
Yes	62	31.0%

Hours worked per week	*n*	%
<20	13	6.5%
20-25	31	15.5%
26-30	6	3.0%
31-35	21	10.5%
36-40	90	45.0%
41-45	24	12.0%
46-50	13	6.5%
50+	6	3.0%

Materials and Procedure

Participants completed an online survey containing the 82 item pool in random order. The final survey is included in Appendix D. Even though the item pool was created to tap into the three proposed dimensions of task-based, interactional, and organizational mindfulness at work, items were presented to participants in random order to increase the inferences of potential distinctions between these factors. After agreeing to the conditions for eligibility and completing an informed consent form, participants were directed to the online survey which was managed by a secured and encrypted online data collection platform (Qualtrics). Participants were asked to rate each item based on the frequency of experiencing each of these aspects of mindfulness at work. The general instruction for all items stated, "On a scale of 1-7 (1 = never, 7 = always), rate how often you experience the following at work." Each of the 7 levels of the scale included specific descriptions of the frequencies for participants' experiences (1 – never, 2 – rarely, 3 – occasionally, 4 – sometimes, 5 – frequently, 6 – usually, 7 – always). After completion of the survey, participants were thanked for their time and provided with contact information for the research team. The MTurk workers were then asked to submit a unique code to Amazon to receive compensation for their time. Even though 27% of participants' data were removed from the analysis, all 273 workers were compensated to maintain anonymity.

Results

Compiled data were analyzed for basic psychometric properties to narrow down the item pool into a short, simple, straightforward measure.

Principal components analysis. Data for the initial 82-item pool were explored using principal component analysis with both varimax and oblimin rotations. As there was no perceptibly significant difference between these rotations, varimax rotation was used as the basis of the analysis. This decision has some basis in previous research, particularly at the initial exploratory phase, and can help simplify the analysis and interpretation of large sets of items (Kim & Mueller, 1978).

The first stage of the principal component analysis revealed 12 initial significant components ($\lambda > 1$), a number far exceeding the theoretically proposed three dimensions that were expected. To begin to reduce down the number of factors to tap into this proposed three-dimensional quality of mindfulness at work, the principal component analysis was held to a total of 3 possible dimensions. Descriptive statistics and communalities/loadings onto these three rotated components are presented in several tables below. Table 2 includes results for proposed task-based mindfulness items, Table 3 results for interactional mindfulness items, and Table 4 results for organizational mindfulness items. These tables reflect a single principle components analysis and have been organized in this way to illustrate the findings across each of the three expected dimensions and their related item pools.

Table 2

Task-based Mindfulness Item-level Descriptive Statistics and Component Loadings for Initial MaW Item Pool

			Component		
	M	*SD*	1	2	3
I notice sensations of my physical body while at work.	4.35	1.473	0.224	0.102	**0.713**
I feel sensations in my body when doing work tasks.	4.29	1.698	0.179	0.110	**0.735**
I notice when I am distracted by thoughts when working.	4.97	1.433	0.095	0.155	**0.553**
I notice when I am distracted by feelings when working.	5.08	1.333	0.066	0.369	**0.509**
I can focus directly on my work task without being distracted by thoughts.	5.37	1.198	0.323	**0.694**	0.151
I can focus directly on my work without being distracted by feelings.	5.46	1.192	0.218	**0.749**	0.049
I am aware of what is going on around me while working.	5.69	1.056	0.181	0.567	0.433
When engaging in a work task, I notice what I am thinking.	5.35	1.191	0.340	0.414	0.558
When doing a work activity, I experience my feelings and emotions.	4.45	1.556	0.333	0.128	**0.581**
I am aware of how I am holding my body when working.	4.73	1.530	0.222	0.103	**0.721**
I pay attention to how I sit or stand when working.	4.20	1.684	0.088	0.067	0.459
I am able to return to work after losing track because of some distracting thought or feeling.	5.63	1.092	0.112	**0.675**	0.135
I notice the environment that I am working in.	5.67	1.264	0.162	0.585	0.462
I am able to pay direct attention to my work.	5.78	1.145	0.192	**0.782**	0.105
I am aware of what is happening around me when working.	5.55	1.209	0.296	**0.600**	0.291
I feel present when doing work tasks.	5.57	1.152	0.265	**0.686**	0.177
I am aware of what I am doing when working.	5.93	1.121	0.100	**0.564**	0.395
When working, I experience my thoughts clearly.	5.60	1.127	0.182	**0.728**	0.278
When working, I experience my feelings and emotions clearly.	5.01	1.374	0.227	0.434	0.554
I catch myself when daydreaming and return to work.	4.65	1.601	0.231	-0.026	0.536
I am not lost in thoughts when doing work.	4.86	1.533	0.202	**0.563**	0.043
I am able to notice when I'm lost in thought and return to work.	5.25	1.286	0.220	0.316	**0.538**
I am aware of how I feel about my day-to-day work.	5.67	1.210	0.212	0.519	0.464
When working, I notice what is happening around me.	5.55	1.217	0.190	**0.671**	0.378
I am able to attend to my work without being distracted.	5.27	1.339	0.377	**0.550**	0.151

**Note: Items with factors in bold were selected for potential use in final measure. Factor loadings are based on principal component analysis using varimax rotation.*

Table 3
Interactional Mindfulness Item-level Descriptive Statistics and Component Loadings for Initial MaW Item Pool

			Component		
	M	*SD*	1	2	3
I feel my emotions directly when interacting with others at work.	4.91	1.438	0.328	0.414	0.616
I experience how I am feeling when talking to coworkers.	5.33	1.311	0.315	0.501	0.535
I have direct and honest conversations with coworkers.	5.27	1.394	0.533	0.564	0.211
I am able to be honest with my coworkers about how I feel about my workplace.	5.19	1.519	0.473	0.527	0.315
I am able to be honest with my coworkers about what I think about my workplace.	5.08	1.446	0.501	0.479	0.277
I am able to speak with my coworkers about work issues honesty and directly.	5.34	1.436	0.535	0.506	0.254
My interactions with coworkers are genuine.	5.32	1.384	0.458	0.506	0.214
I feel like I can be myself when interacting with others at work.	5.11	1.516	0.490	0.524	0.235
I listen to others at work without being distracted by thoughts.	5.08	1.322	0.366	**0.614**	0.199
I have a clear sense of what I think about my coworkers when I talk to them.	5.43	1.261	0.247	0.497	0.545
When talking to coworkers, I try to understand their needs.	5.45	1.324	0.355	**0.660**	0.331
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.	5.19	1.227	0.385	**0.635**	0.197
When interacting with coworkers, I am able to listen without being distracted by emotions.	5.33	1.223	0.295	**0.699**	0.124
I am in touch with how I feel about my coworkers when interacting with them.	5.26	1.353	0.228	0.482	0.485
I am aware of what I think about my coworkers when interacting with them.	5.38	1.237	0.323	0.476	0.460
I am able to listen to coworkers attentively when interacting.	5.59	1.227	0.367	**0.746**	0.194
When talking to a coworker, I hear what they are saying clearly and directly.	5.66	1.046	0.251	**0.726**	0.153
When talking to a coworker, I feel like they understand what I am trying to say.	5.39	1.237	0.439	0.570	0.315
I notice my thoughts when talking with others at work.	5.25	1.222	0.270	0.424	0.593
I experience my feelings when talking with coworkers.	4.95	1.431	0.320	0.345	**0.599**
I feel heard when talking with my coworkers.	5.29	1.346	0.486	0.556	0.289
I have constructive conversations with others at work.	5.26	1.386	0.563	0.481	0.257
I notice the sensations in my body when interacting with coworkers.	4.35	1.638	0.260	0.126	**0.744**
I feel present when interacting with coworkers.	5.52	1.193	0.375	**0.689**	0.269
I am aware of the environment when interacting with coworkers.	5.40	1.333	0.217	0.335	**0.656**
I am able to distinguish between how I'm feeling about something and how a coworker might feel about something when interacting with others at work.	5.39	1.282	0.294	0.498	0.424
I notice the difference between my own thoughts and the thoughts of a coworker when interacting with others at work.	5.22	1.400	0.160	0.312	0.479

Note: Items with factors in bold were selected for potential use in final measure. Factor loadings are based on principal component analysis using varimax rotation.

Table 4

Organizational Mindfulness Item-level Descriptive Statistics and Component Loadings for Initial MaW Item Pool

			Component		
	M	*SD*	1	2	3
My workplace directly addresses work-related problems as they arise.	5.22	1.500	**0.765**	0.358	0.202
My workplace uses mistakes as an opportunity to improve.	4.85	1.609	**0.810**	0.180	0.294
My workplace actively addresses mistakes as they arise.	5.24	1.415	**0.782**	0.288	0.169
My workplace welcomes a diversity of views and opinions from employees.	5.07	1.644	**0.802**	0.243	0.213
My workplace appreciates employees' perspectives.	4.89	1.562	**0.818**	0.204	0.228
My workplace values analysis and understanding when making decisions.	5.23	1.503	0.664	0.221	0.274
My workplace actively addresses small problems before they become big problems.	4.96	1.578	**0.803**	0.239	0.144
My workplace encourages coworkers to be aware of the needs of others.	4.98	1.665	0.662	0.374	0.292
My workplace expects leaders to be in touch with what is happening.	5.49	1.490	0.736	0.302	0.198
My workplace plans ahead to make sure employees have what they need when they need it.	5.05	1.564	**0.775**	0.191	0.165
My workplace values employee training and development.	5.06	1.621	0.737	0.187	0.218
My workplace attends to problems directly.	5.03	1.489	**0.763**	0.294	0.254
My workplace is able to bounce back from setbacks.	5.34	1.244	0.597	0.386	0.255
My workplace is forward-thinking in its strategy.	4.96	1.648	**0.842**	0.230	0.230
My workplace makes decisions based on appropriate analysis.	5.13	1.551	**0.781**	0.232	0.180
My workplace adapts to meet changing market or customer demands.	5.15	1.497	**0.767**	0.283	0.146
My workplace encourages employees to come up with new ways to solve problems.	4.94	1.694	0.720	0.220	0.231
My workplace uses the best possible information to solve problems.	4.91	1.609	**0.833**	0.283	0.181
My workplace changes its approach to problems when the need arises.	5.07	1.514	**0.786**	0.311	0.189
My workplace acts quickly to solve problems.	5.03	1.499	**0.774**	0.292	0.191
My workplace uses the best experts to solve problems, no matter their position in the company.	4.41	1.643	0.744	0.173	0.223
My workplace encourages employees to strive for their best.	5.51	1.466	0.724	0.370	0.203
My workplace values respect for others.	5.48	1.579	**0.766**	0.289	0.163
My workplace responds appropriately to challenges as they arise.	5.20	1.483	**0.842**	0.269	0.168
My organization uses the right person for the job.	5.02	1.419	**0.812**	0.223	0.140
My workplace is concerned with employees feeling emotionally connected to their coworkers.	4.22	1.804	0.634	0.176	0.347
My workplace views the success of all employees as important for the success of the organization.	5.14	1.627	**0.823**	0.145	0.212
My workplace encourages employees to support each other in work tasks.	5.29	1.455	0.560	0.289	0.282
My workplace encourages employees to support each other emotionally.	4.23	1.832	0.627	0.238	0.359
My workplace wants employees to feel connected to the organization.	5.16	1.468	0.585	0.240	0.332

Note: Items with factors in bold were selected for potential use in final measure. Factor loadings are based on principal component analysis using varimax rotation.

Several criteria were established to narrow down the item pool. In order for an item to move to the next stage of scale development, the item needed to load cleanly onto a single component of the three (i.e. not loading onto multiple dimensions). Loadings for items considered for the next stage of measure development are indicated in bold in Tables 2-4. Communalities were assessed across these three factors to begin narrowing down the item pool.

For task-based and interactional mindfulness, items with loadings that exceeded .4 for at least two of the three proposed components were not carried over to the next stage, while items that expressed loadings of greater than .5 for a single component were retained (Jolliffe, 2002). These distinctions were made as task-based and interactional mindfulness items seemed to be loading onto all three factors, so this choice was made to assist in further clarifying and reducing the dimensions of the items. For organizational mindfulness items, all items loaded cleanly onto the first component, so items with strong loadings (> .75) were retained for the next stage of analysis. This process reduced the item pool to 46 items: 18 for task-based mindfulness, 10 for interactional mindfulness, and 18 for organizational mindfulness.

For the second stage of exploration, these 46 items were then analyzed using the same method described above using principal components analysis with varimax rotation. Means, standard deviations, and component loadings are provided in Table 5. This analysis revealed five significant components ($\lambda > 1$). Items were considered for inclusion in the final measure based on the same criteria as the preliminary analysis. This analysis only led to the exclusion of one item ("I am not lost in thoughts when doing work"). Several items loaded onto a third and fourth component for both task-based and

interactional items, but no items loaded onto the fifth factor, suggesting that this factor was not a significant one to retain given the behaviour of the items.

Table 5
Descriptive Statistics and PCA with Varimax Rotation Following Initial Item Pool Reduction

			Component				
	M	*SD*	1	2	3	4	5
Factor Eigenvalue			21.9	4.43	2.97	1.25	1.05
% of variance			48.64%	9.85%	6.60%	3.00%	2.32%
Task-based mindfulness (N = 18)							
I notice sensations of my physical body while at work.	4.35	1.473	0.200	0.143	**0.810**	0.106	-0.027
I feel sensations in my body when doing work tasks.	4.29	1.698	0.150	0.154	**0.831**	0.127	-0.043
I notice when I am distracted by thoughts when working.	4.97	1.433	0.138	0.084	0.345	**0.637**	0.144
I notice when I am distracted by feelings when working.	5.08	1.333	0.102	0.313	0.310	**0.679**	-0.054
I can focus directly on my work task without being distracted by thoughts.	5.37	1.198	0.295	**0.756**	0.233	-0.121	0.016
I can focus directly on my work without being distracted by feelings.	5.46	1.192	0.198	**0.806**	0.044	0.023	0.106
When doing a work activity, I experience my feelings and emotions.	4.45	1.556	0.317	0.161	**0.616**	-0.024	0.142
I am aware of how I am holding my body when working.	4.73	1.530	0.232	0.135	**0.702**	0.116	0.306
I am able to return to work after losing track because of some distracting thought or feeling.	5.63	1.092	0.146	**0.687**	0.017	0.235	0.072
I am able to pay direct attention to my work.	5.78	1.145	0.195	**0.817**	0.069	0.076	0.190
I am aware of what is happening around me when working.	5.55	1.209	0.272	**0.688**	0.134	0.048	0.319
I feel present when doing work tasks.	5.57	1.152	0.137	**0.564**	0.294	0.178	0.451
I am aware of what I am doing when working.	5.93	1.121	0.206	**0.722**	0.162	0.264	0.146
When working, I experience my thoughts clearly.	5.60	1.127	0.163	**0.625**	0.182	-0.189	-0.217
I am not lost in thoughts when doing work.	4.86	1.533	0.205	0.343	0.460	0.268	0.284
I am able to notice when I'm lost in thought and return to work.	5.25	1.286	0.257	**0.583**	0.213	0.442	0.097
When working, I notice what is happening around me.	5.55	1.217	0.332	**0.651**	0.299	-0.202	0.059
I am able to attend to my work without being distracted.	5.27	1.339	0.337	**0.685**	0.263	-0.027	-0.160
Interactional mindfulness (N = 10)							
I listen to others at work without being distracted by thoughts.	5.08	1.322	0.360	**0.539**	0.262	0.261	-0.274
When talking to coworkers, I try to understand their needs.	5.45	1.324	0.392	**0.635**	0.187	0.131	-0.096
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.	5.19	1.227	0.284	**0.722**	0.143	0.102	-0.172
When interacting with coworkers, I am able to listen without being distracted by emotions.	5.33	1.223	0.398	**0.701**	0.115	0.276	-0.106
I am able to listen to coworkers attentively when interacting.	5.59	1.227	0.298	**0.676**	0.014	0.352	0.086
When talking to a coworker, I hear what they are saying clearly and directly.	5.66	1.046	0.334	0.312	**0.536**	0.267	-0.240
I experience my feelings when talking with coworkers.	4.95	1.431	0.228	0.164	**0.840**	0.161	-0.158
I notice the sensations in my body when interacting with coworkers.	4.35	1.638	0.391	**0.640**	0.216	0.179	0.070
I feel present when interacting with coworkers.	5.52	1.193	0.252	0.285	**0.541**	0.242	0.455
I am aware of the environment when interacting with coworkers.	5.40	1.333	**0.799**	0.341	0.155	0.152	0.022
Organizational mindfulness items (N = 18)							
My workplace directly addresses work-related problems as they arise.	5.22	1.500	**0.799**	0.341	0.155	0.152	0.022
My workplace uses mistakes as an opportunity to improve.	4.85	1.609	**0.816**	0.186	0.258	0.090	0.044
My workplace actively addresses mistakes as they arise.	5.24	1.415	**0.819**	0.244	0.108	0.169	0.062
My workplace welcomes a diversity of views and opinions from employees.	5.07	1.644	**0.788**	0.254	0.208	0.010	0.045
My workplace appreciates employees' perspectives.	4.89	1.562	**0.809**	0.202	0.217	0.005	0.036
My workplace actively addresses small problems before they become big problems.	4.96	1.578	**0.836**	0.218	0.124	0.059	0.008
My workplace plans ahead to make sure employees have what they need when they need it.	5.05	1.564	**0.771**	0.226	0.212	-0.060	-0.108
My workplace attends to problems directly.	5.03	1.489	**0.804**	0.268	0.168	0.131	0.083
My workplace is forward-thinking in its strategy.	4.96	1.648	**0.842**	0.230	0.215	0.071	-0.003
My workplace makes decisions based on appropriate analysis.	5.13	1.551	**0.799**	0.216	0.124	0.067	0.108
My workplace adapts to meet changing market or customer demands.	5.15	1.497	**0.793**	0.252	0.091	0.075	0.053
My workplace uses the best possible information to solve problems.	4.91	1.609	**0.843**	0.283	0.196	0.034	-0.082
My workplace changes its approach to problems when the need arises.	5.07	1.514	**0.830**	0.274	0.120	0.177	0.052
My workplace acts quickly to solve problems.	5.03	1.499	**0.811**	0.270	0.143	0.175	-0.033
My workplace values respect for others.	5.48	1.579	**0.775**	0.249	0.101	0.175	0.018
My workplace responds appropriately to challenges as they arise.	5.20	1.483	**0.877**	0.243	0.128	0.107	0.023
My organization uses the right person for the job.	5.02	1.419	**0.807**	0.223	0.193	-0.045	-0.037
My workplace views the success of all employees as important for the success of the organization.	5.14	1.627	**0.830**	0.142	0.200	-0.043	0.129

To attempt to clarify the dimensions, task-based items that seemingly loaded onto a third or fourth factor were removed from the item pool, resulting in the removal of six task-based items. It was at this stage that the unidimensional nature of individual mindfulness revealed itself, merging both task-based and interactional mindfulness into a single dimension. Additionally, three items were identified as similar to other retained items ("I am able to notice when I'm lost in thought and return to work", "When working, I notice what is happening around me", and "I am able to attend to my work without being distracted"). Similar items with the strongest loadings were retained while those with the lower loading were removed. This process resulted in 8 remaining items for task-based mindfulness.

For interactional mindfulness, one item was removed because of similarity to other items ("I listen to others at work without being distracted by thoughts"). Another item was removed as it was the only item that was not based on organizational mindfulness that loaded onto the first factor ("I am aware of the environment when interacting with coworkers"). One item that loaded strongly onto the third component was removed ("I experience my feelings when talking with coworkers"). Another item was removed as it did not load as strongly onto the second factor as others (<.6, "I listen to others at work without being distracted by thoughts"). This analysis resulted in six remaining items for interactional mindfulness.

For organizational mindfulness, as all items loaded strongly onto the first component (>.75), three items for each of the five proposed dimensions of organizational mindfulness were retained (Ray et al., 2011) based on strong loadings onto the first component. This process led to the elimination of three items ("My workplace responds

appropriately to challenges as they arise", "My workplace acts quickly to solve problems", and "My workplace adapts to meet changing market or customer demands"), resulting in 15 remaining items for organizational mindfulness that strongly loaded onto the first component.

For the third and final stage of exploration, the remaining items (8 task-based, 6 interactional, and 15 organizational) were analyzed using principal components analysis, except for this analysis oblique oblimin rotation with Kaiser normalization was used as it was theoretically expected that these dimensions would be correlated once the initial item pool had been reduced down into a functional set. This analysis revealed two significant components ($\lambda > 1$). Up to this stage in the process, the research had proposed three components to mindfulness at work based on existing theoretical propositions (task-based, interactional, and organizational mindfulness). At this stage, given the seeming bi-dimensional nature of the items, task-based and interpersonal mindfulness were reduced into one dimension, individual mindfulness, while the construct of organizational mindfulness remained as a clear construct even from the first stage of exploration. Table 6 provides means, standard deviations, reliability estimates, and component loadings for this analysis. Reliability estimates were strong for both individual mindfulness at work (α = .95, N = 14) and organizational mindfulness (α = .98, N = 15), although these reliabilities were expected to reduce during the subsequent confirmatory stage, given the undesirability of excessively high alphas and the iterative nature of the scale development process (DeVellis, 2016; Taber, 2017).

Table 6

Initial Mindfulness at Work Scale Item-level Descriptive Statistics, Subscale Reliability Estimates, and Component Loadings

			Component	
	M	*SD*	1	2
Factor Eigenvalue			16.23	3.63
% of variance			55.95%	12.50%
Individual Mindfulness Items (α = .95, N = 14)				
I can focus directly on my work task without being distracted by thoughts.	5.37	1.198	0.092	**0.728**
I can focus directly on my work without being distracted by feelings.	5.46	1.192	-0.079	**0.847**
I am able to return to work after losing track because of some distracting thought or feeling.	5.63	1.092	-0.147	**0.825**
I am able to pay direct attention to my work.	5.78	1.145	-0.121	**0.921**
I am aware of what is happening around me when working.	5.55	1.209	0.185	**0.588**
I feel present when doing work tasks.	5.57	1.152	0.026	**0.765**
I am aware of what I am doing when working.	5.93	1.121	-0.060	**0.724**
When working, I experience my thoughts clearly.	5.60	1.127	-0.057	**0.850**
When talking to coworkers, I try to understand their needs.	5.45	1.324	0.240	**0.542**
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.	5.19	1.227	0.229	**0.610**
When interacting with coworkers, I am able to listen without being distracted by emotions.	5.33	1.223	0.082	**0.721**
I am able to listen to coworkers attentively when interacting.	5.59	1.227	0.181	**0.727**
When talking to a coworker, I hear what they are saying clearly and directly.	5.66	1.046	0.028	**0.786**
I feel present when interacting with coworkers.	5.52	1.193	0.201	**0.681**
Organizational Mindfulness Items (α = .98, N = 15)				
My workplace directly addresses work-related problems as they arise.	5.22	1.500	**0.786**	0.163
My workplace uses mistakes as an opportunity to improve.	4.85	1.609	**0.898**	-0.032
My workplace actively addresses mistakes as they arise.	5.24	1.415	**0.831**	0.061
My workplace welcomes a diversity of views and opinions from employees.	5.07	1.644	**0.837**	0.038
My workplace appreciates employees' perspectives.	4.89	1.562	**0.883**	-0.032
My workplace actively addresses small problems before they become big problems.	4.96	1.578	**0.879**	-0.013
My workplace plans ahead to make sure employees have what they need when they need it.	5.05	1.564	**0.836**	-0.024
My workplace attends to problems directly.	5.03	1.489	**0.817**	0.082
My workplace is forward-thinking in its strategy.	4.96	1.648	**0.905**	-0.002
My workplace makes decisions based on appropriate analysis.	5.13	1.551	**0.850**	-0.002
My workplace uses the best possible information to solve problems.	4.91	1.609	**0.887**	0.043
My workplace changes its approach to problems when the need arises.	5.07	1.514	**0.828**	0.091
My workplace values respect for others.	5.48	1.579	**0.806**	0.059
My workplace uses the right person for the job.	5.02	1.419	**0.878**	-0.038
My workplace views the success of all employees as important for the success of the organization.	5.14	1.627	**0.917**	-0.102

Note: The factor loadings are based on a principal component analysis using oblimin rotation with Kaiser normalization.

Discussion

The results of this study were promising for the next stage of psychometric development, albeit somewhat surprising. Given the fact that three distinct dimensions were expected, representing task-based, interactional, and organizational mindfulness, it was unexpected to find that task-based and interactional mindfulness reduced into a single dimension. This finding was surprising as the cognitive, emotional, and behavioural processes required for task completion vs. interacting with others were thought to be somewhat distinct given the differences in mindful behaviour across these domains. These findings suggest that with mindfulness, or at least in this case mindfulness at work, the attention and awareness needed for mindful experience contribute together to both tasks and interactions to create mindful experiences at the individual level regardless of the type of behaviour. Organizational mindfulness, however, clearly held together very well, which made sense as it operates as an organizational function and is a part of organizational culture and climate, unlike individual mindfulness. However, what was surprising about the organizational mindfulness scale was its single factor structure, given the five-factor organizational mindfulness measure that these items were based on (Ray et al., 2011). As the "western" conceptualization and the resulting conceptualization often deals with the five factors of preoccupation with failure, reluctance to simplify, deference to expertise, commitment to resilience, and sensitivity to operations, this finding contradicts this theoretical basis and points to OM as a single-factor construct.

These two dimensions of individual and organizational mindfulness (IM and OM) both showed good reliability and appeared psychometrically sound from the point of

view of internal consistency. The organizational mindfulness scale, in particular, seemed most strongly unidimensional and internally consistent. This finding is of note as the items developed to tap into organizational mindfulness were based on the five-factor model of organizational mindfulness. The fact that these items seemingly fit together so well and are unidimensional goes against the notion that these are in fact five distinct factors. These findings could also simply be due to method bias, as these items were distinct from the individual focus of the task-based and interactional mindfulness items, perhaps leading to similar responses across these items in particular as they stood out from the rest.

The next study in the sequence attempted to control for these factors present across IM and OM subscales through the use of confirmatory factor analysis methods. Beyond continuing to explore psychometric concerns, the follow-up study provided initial validation for the MaW. Convergent and discriminant validity were examined using a number of non-clinical measures that have been previously established in the literature and that were suggested by other authors as reasonable validation constructs for mindfulness at work. Other work-relevant measures were also included.

Chapter 4: Study 2- Confirmatory Factor Analysis and Validation

Following the narrowing down of the item pool completed for study one, study two attempted to confirm the bi-dimensional structure of the MaW scale through the use of structural equation modeling for confirmatory factor analysis. Further data collection from a different sample was the basis of this second study. The data for study two was analyzed using structural equation modeling to assess the fit of the data with the proposed two-factor structure. Additionally, this study explored initial efforts at validation using various related and unrelated measures. This validation effort drew on a range of measures for convergent, discriminant, and potential future predictive validity purposes. These various measures, reasons for their inclusion, and expected and observed patterns of relationships are described below. Generally speaking, strong relationships with measures would suggest convergent validity, while low or no relationship would suggest discriminant validity. Items with considerable convergent validity despite being theoretically distinct constructs can serve as the basis for future predictive validation.

Method

Participants

Participants were once again recruited using the MTurk worker pool. Criteria for participation were more selective than they were for study one. MTurk approval rating, or percentage of accepted work, was switched from 90%+ to 95%+, and overall number of approved work completed was increased from 100 to 500. This study used the same criteria for eligibility as the first study (at least part time work in past 6 months). Although not necessarily the result of this change in worker criteria, the attrition rate was reduced significantly down to 13.5% from the 27% attrition of Study 1. Only 231

participants were needed to meet the needed 200 participants to complete the study with an adequate sample size. Participants once again completed attention check questions, but this time they were asked to complete two attention check questions due to the length of the survey provided. Responders who failed to respond appropriately to one of both of the attention check questions were removed from the data pool. Responses completed in less than 8 minutes were also removed from the pool.

Procedure

Participants completed an online survey consisting of the 29-item MaW measure as well as the validation measures described below. Participants completed an informed consent form before gaining access to the survey. Participants provided demographic information on age, biological sex, race, ethnicity, full-time/part-time employment, industry, and hours worked per week. In addition, participants were asked to identify whether or not they actively practiced any form of mindfulness (meditation, yoga, etc.). Expanding on the first study, participants also identified how long they have been practicing mindfulness in years and were asked to rate how important mindfulness was to them on a 5-point scale. Demographic information for participants is presented in Table 7. Once participants had completed the validation measurement battery, they were given a unique code that they submitted to MTurk for payment. Participants were compensated at the rate of 10 cents CAD/minute. As the survey was expected to take ~25 Minutes to complete, participants were compensated $2.50 CAD, which at the time of the study converted to $2.03 USD.

Table 7

Demographic Characteristics of Participants for Validation Study

Age	*n*	%
20-24	10	5.0%
25-29	37	18.1%
30-34	52	25.5%
35-39	33	16.2%
40-44	23	11.3%
45-49	17	8.3%
50-54	10	4.9%
55-59	10	4.9%
60+	9	4.4%
Sex	*n*	%
Female	96	48.0%
Male	104	52.0%
Race	*n*	%
Asian	10	5.0%
Black	16	8.0%
Native/Indigenous	1	0.5%
Two or more races	4	2.0%
White	169	84.5%
Ethnicity	*n*	%
Hispanic	7	3.5%
Non-Hispanic	193	96.5%
Full time/Part time	*n*	%
Full-time	169	84.5%
Part-time	31	15.5%
Hours worked per week	*n*	%
<20	4	2.0%
20-25	18	9.0%
26-30	9	4.5%
31-35	13	6.5%
36-40	104	52.0%
41-45	27	13.5%
46-50	10	5.0%
50+	15	7.5%
Mindfulness practice	*n*	%
No	113	56.5%
Yes	87	43.5%
Mindfulness years	*n*	%
1-2	36	18.0%
3-6	26	13.0%
7-10	12	6.0%
11-15	7	3.5%
15+	6	3.0%
Mindfulness importance	*n*	%
1	14	7.0%
2	23	11.5%
3	29	14.5%
4	20	10.0%
5	1	0.5%

Materials

The following measures were used for the purposes of convergent and discriminant validation while providing a basis for possible future predictive validation research. Descriptive statistics for all measures, including skewness and kurtosis, are provided in Table 8.

Table 8

Cronbach's Alpha, Skewness, Kurtosis, and Tests of Non-normality for Validation Measures

					Shapiro-Wilk Test	
Measure	α	N of items	Skewness	Kurtosis	Stat.	Sig.
IM	0.85	6	-0.549	0.192	0.968	0.000
OM	0.94	5	-0.754	-0.121	0.939	0.000
MAAS	0.94	15	-0.586	-0.154	0.963	0.000
AELS	0.89	11	-0.575	0.703	0.975	0.001
ROM	0.97	43	-0.841	0.018	0.933	0.000
PF	0.67	8	-0.643	0.175	0.966	0.000
RS	0.95	12	-0.706	-0.271	0.943	0.000
SO	0.93	8	-0.894	0.289	0.934	0.000
CR	0.86	8	-0.805	0.251	0.947	0.000
DE	0.92	7	-0.869	0.017	0.924	0.000
RelSat	0.93	8	-1.060	1.119	0.925	0.000
SMS	0.78	25	0.305	-0.368	0.983	0.016
OCB	0.91	12	-0.140	-0.385	0.991	**0.288**
OCB-O	0.86	6	-0.064	-0.620	0.987	**0.074**
OCB-P	0.85	6	-0.243	-0.206	0.988	**0.096**
OrgCom	0.98	4	-1.084	0.288	0.863	0.000
Flow	0.85	10	-0.565	0.682	0.978	0.003
FlowAbs	**0.38**	4	-0.318	0.663	0.982	0.012
FlowVal	0.60	3	-0.135	-0.210	0.988	**0.082**
FlowFlu	0.89	6	-0.455	0.253	0.980	0.007
NegAff	0.92	10	1.214	1.998	0.904	0.000
PosAff	0.93	10	-0.292	-0.176	0.989	**0.137**
Consc	0.61	2	-0.817	-0.340	0.877	0.000
EmoStab	0.86	2	-0.954	0.023	0.879	0.000
Extra	0.85	2	0.051	-1.189	0.945	0.000
JobSat	*	1	-1.088	0.037	0.815	0.000
POS	0.95	8	-0.729	-0.112	0.940	0.000
OPS	0.89	7	-0.757	-0.066	0.940	0.000

Note. IM: Individual mindfulness at work. OM: Organizational mindfulness. MAAS: Mindful Attention Awareness Scale. AELS: Active and Empathic Listening Scale. ROM: Ray et al. large organizational mindfulnes measure. PF: Preoccupation with failure. RS: Reluctance to simplify. SO: Sensitivity to operations. CR: Commitment to resilience. DE: Deference to expertise. RelSat: Relationship satisfaction at work. SMS: Self-monitoring scale. OCB: Organizational citizenship behaviors (general). OCB-O: Organizational citizenship behaviors (organization). OCB-P: Organizational citizenship behaviors (person). OrgCom: Organizational commitment. Flow: General flow. FlowAbs: Flow absorption. FlowVal: Flow valence. FlowFlu: Flow fluency. NegAff: Negative affect. PosAff: Positive affect. Consc: Conscientiousness. EmoStab: Emotional stability. Extra: Extraversion. JobSat: General job satisfaction, single item = no alpha estimate. POS: Perceived organizational support. OPS: Organizational psychological safety. Significance levels in bold meet the assumption of normality. Alphas in bold represent unacceptable reliability estimates (< .6), while bold p-values represent normal data (p > .05).

Mindfulness at Work. The 29-item MaW scale was initially used as the basis for this validation study. 14 items tapped into individual mindfulness at work both in task completion, general attention/awareness, and interactions with coworkers. The MaW also contained 15 items that assessed employee perceptions of organizational mindfulness, with 3 items each for the 5 dimensions of organizational mindfulness, described below.

Organizational mindfulness. A modified version of the full five-factor measure for organizational mindfulness (Ray et al., 2011) was used to assess the validity of the organizational mindfulness dimension of the MaW. This measure contains 43 items across five theoretical subscales: preoccupation with failure (PF), reluctance to simplify information (RS), sensitivity to operations (SO), commitment to resilience (CR), and deference to expertise (DE). The measure was assessed both unidimensionally and multidimensionally for the validation analysis. Although the initial measure contained a 5 point scale (1 = extremely inaccurate, 5 = extremely accurate), these levels were expanded to a 7 point scale for consistency in scale across the measures.

Individual mindfulness. The Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003) was used as a validation measure for the individual mindfulness at work dimensions. This measure was chosen because of its prevalent usage in the organizational sciences. Fairly strong associations were expected as the MAAS captures general mindfulness in life, a construct which should relate with how mindful an individual is at work. The initial measure proposed a descending 5-point scale (5 = always, 1 = never). This structure was modified for this study to a 7 point scale in

ascending order (1 = never, 7 = always) to match the scale of the other validation measures.

Active listening. To help validate interactional mindfulness contained within the individual mindfulness subscale, a modified version of the Active-Empathic Listening Scale (Drollinger, Comer, & Warrington, 2006) was used for this unique aspect of the MaW (self-reported modified AELS, Bodie, 2011). This measure contains 11 items with three dimensions: sensing, processing, and responding. However, the author of the modified subscale stated after being contacted by the researcher that the scale is typically analyzed as a single factor (personal communication, Sept. 20, 2017). Therefore, all three dimensions were reported as one dimension when completing the validation analysis.

Workplace relationship satisfaction. Another measure that was included to validate the interactional elements of individual mindfulness at work was the relationship satisfaction scale (RS10, Røysamb, Vittersø, & Tambs, 2014). Given the potential impact of individual-level interactional mindfulness on relationship quality, this construct seemed particularly relevant for validation purposes. This measure was modified to reflect relationships with coworkers (i.e. "I have a close relationship with my spouse/partner" changed to "I have a close relationship with my coworkers"). Items that did not fit the workplace (i.e. children-related questions) were removed, resulting in an 8-item modified measure. Additionally, the initial 6-point scale (1 = strongly disagree, 6 = strongly agree) was changed to a 7-point scale to include a neutral point in line with the other measures used for validation purposes.

Self-monitoring. Self-monitoring involves a hyper-vigilance of one's attitudes and actions, and has been shown to be unrelated to mindfulness in previous research (Brown & Ryan, 2003). Therefore, the self-monitoring scale (SMS, Snyder, 1974) was used for the purposes of discriminant validation. The SMS contains 22 items that are rated as true or false for the individual (i.e. "I guess I put on a show to impress or entertain people"). Responses to these items are then scored as self-monitoring or otherwise and an individual is given a final "score" out of 22. Given the unique method of assessing this scale, the scale of the final SMS score was not changed into the 7-point scale used for the other validation measures. Additionally, the initial scale proposes ranges for high (15-22), intermediate (9-14), and low (0-8) degree of self-monitoring. For the validation analysis, the total final score was used instead of using categorical variables of high, intermediate, and low.

Organizational citizenship behaviours. As mindfulness has been previously linked to organizational citizenship behaviours (OCBs), or voluntary helping behaviours at work (Reb et al., 2015), and given the implications of OCBs for organizational performance and cohesion, OCBs were included in the validation process. This inclusion was intended for traditional convergent/discriminant validation purposes and to indicate the possible predictive validity of mindfulness at work for frequency of OCBs. The measure used to capture OCBs was the Organizational Citizenship Behavior Checklist (OCB-C, Fox, Spector, Goh, Bruursema, & Kessler, 2012), a 20-item measure that captures person-focused OCBs and organization-focused OCBs. The researchers used the measure as both a unidimensional (OCB) and bi-dimensional (OCB-P and OCB-O)

tool to assess any potential differences when validating for person-focused and organization-focused helping behaviours.

Organizational commitment. Organizational commitment was included an organizationally relevant measure begin to assess relationships between organizational and individual mindfulness and how invested in the workplace an employee might feel. A short unidimensional measure of organizational commitment was used for simplicity and because of criticisms about the multidimensional assessment of organizational commitment (KUT, Klein, Cooper, Molloy, & Swanson, 2014). This measure consists of four items that were rated on a 7-point scale (1 = not at all, 7 = completely).

Flow. The experience of flow at work, or the paradoxical experience of loss of time and self-focused awareness that results in increased absorption in an activity (Csikszentmihalyi, 1997), has received significant attention both in positive psychology and the organizational sciences because of the positive states that flow elicits. As flow consists of a seeming loss of time and awareness of one's environment, there has been some disagreement as to whether flow is actually a mindful experience or quite the opposite, given that mindful awareness, being so present-focused, could disrupt this flow state (Bryant & Veroff, 2017; Reid, 2011). Also, paradoxically, flow has been discussed as a creative state, which aligns with the cognitive processes of creativity and novel thinking related to mindfulness.

Because of these seeming paradoxes and questions about the relationships between mindfulness and the flow experiences, flow was included as a construct for the validation process. An English-language versions of the flow short scale (FSS, Rheinberg, Vollmeyer, & Engeser, 2003) was used to assess the flow experience while at

work. This scale contains 13 items with three proposed subscales: fluency of performance (6 items), absorption (4 items), and valence (3 items), or importance of outcomes. Participants were asked to rate the frequency of their experience of these aspects of flow on a 7 point scale (1 = never, 7 = always). The researchers assessed flow as a unidimensional construct including fluency and performance (10 items), and considered both subscales separately, given the relevance of absorption as a contrary construct to mindful, in-the-moment attention and awareness. Flow valence was also analyzed separately as intended by the authors of the FSS.

Positive and negative affect. Given the affective mechanisms of mindfulness related to emotional regulation and the tendency for mindful individuals to experience more consistent positive affective states, positive and negative affect were included in the validation process. The Positive and Negative Affect Schedule was used for this purpose (PANAS, Watson, Clark, & Tellegen, 1988). The initial general extent of feeling used a 5-point scale (1 = very slightly or not at all, 5 = extremely), and this scale was adjusted to a 7-point scale (1 = never, 7 = always). Positive and negative affect were scored independently and used as separate constructs for the validation analysis.

Personality. The "Big Five" of personality are commonly used by social science researchers to assess individual differences. Meta-analysis of previous research around mindfulness and the big five indicates that trait mindfulness is negatively related to neuroticism/positively related to emotional stability and positively related to conscientiousness (Giluk, 2009). Because of these previous findings, and to supplement the validation process with additional individual differences measures, the Big Five were measured using the 10 item personality inventory (TIPI, Gosling, Rentfrow, & Swann,

2003), a short measure that included two descriptors for each of the big five, with one item per construct positively worded and the other negatively worded (i.e. for extraversion, "extraverted, enthusiastic" and "reserved, quiet"). Items were rated on a 7-point scale (1 = strongly disagree, 7 = strongly agree). Despite previous success with this short measure, only three of the five (extraversion, conscientiousness, and emotional stability) presented acceptable internal consistencies ($\alpha > .6$). Therefore, only these three of the big five were included in the validity analysis.

Job satisfaction. Job satisfaction is an organizationally relevant construct that has been previously linked to mindfulness training (Hülsheger et al., 2013), with increases in job satisfaction resulting from this training. Job satisfaction was included in the validation study to examine possible predictive validation measures and to serve as an organizationally relevant construct to use in the validation process. A simple, one item measure for job satisfaction was used (Brayfield & Rothe, 1951). Participants rated the item "All in all, I am satisfied with my job" on a scale of 1-7 (1 = strongly agree, 7 = strongly disagree).

Perceived organizational support. Perceived organizational support is a well-established, organizational-level construct that explores how strongly employees feel that their organization supports employees and recognizes accomplishments. This measure was chosen for validation purposes because of its established importance as an organization-level construct and the organization-level nature of the organizational mindfulness measure. The 8-item Short Perceived Organizational Support measure (SPOS-8, Eisenberger, Huntington, Hutchison, & Sowa, 1986; Rhoades & Eisenberger, 2002) was chosen for its brevity and has been shown to act unidimensionally. Items for

the SPOS-8 were rated on agreement on a 7-point scale (1 = strongly disagree, 7 = strongly agree).

Organizational psychological safety. Another organizational-level construct that has been suggested as a possible validation measure is psychological safety as psychological safety at work can increase an employee's tendency to be direct and honest, a type of behaviour that aligns with the mindful experience. Organization-level psychological safety was therefore included in the validation process. A measure of team psychological safety was modified to change team-based language to organizational language (i.e. "It is difficult to ask other members of this team for help" to "It is difficult to ask other members of my workplace for help"; modified Edmondson, 1999). Seven items were rated on agreement on a 7-point scale (1 = very inaccurate, 7 = very accurate).

Results

Several confirmatory factor analyses, a follow-up exploratory factor analysis, and non-parametric correlations were completed to further refine the psychometric precision of the MaW and begin the process of validation.

Initial Confirmatory Factor Analysis

The 29-item MaW scale was analyzed for confirmatory factor analysis using EQS for structural equation modeling. The IM and OM factors were allowed to covary given their theoretically proposed relationship. Fourteen IM items were loaded onto the IM factor, while 15 OM items were loaded onto the OM factor. Because of the non-normal nature of the data, robust methods were used to assess goodness of fit for the bi-dimensional model (Finney & DiStefano, 2006).

Results for this first CFA are presented in Table 9, while a visual representation of the analysis is provided in Figure 3. Surprisingly, this analysis revealed a poor fit, despite the preliminary exploratory findings in Study 1. The overall Satorra-Bentler chi-square was significant ($S\text{-}B\chi 2$ = 825.2, df = 376, $p < .05$) and the fit indices provided by EQS were poor (*NNFI* = .87, *IFI* = .88). Because of the seemingly poor fit of the 29-item MaW, further exploratory analysis was needed to help improve the fit.

Table 9

Robust Methods Test Statistic, Robust Methods Standard Error, Unstandardized Loading Estimates, Standardized Solution with Coefficient of Determination, and Robust Goodness of Fit Indices for 29-item MaW with IM and OM as Latent Variables

	S-Bχ2	*df*	*NNFI*	*IFI*	
Model fit	825.200	376	0.87	0.88	
	Test stat.	*SE*	*B*	β	R^2
IM1	*	*	1	0.707	0.500
IM2	14.13	0.069	0.981	0.683	0.466
IM3	12.90	0.083	1.064	0.655	0.428
IM4	12.73	0.071	0.904	0.679	0.462
IM5	6.46	0.125	0.807	0.508	0.258
IM6	12.94	0.093	1.206	0.845	0.715
IM7	12.82	0.098	1.253	0.846	0.716
IM8	12.61	0.096	1.206	0.827	0.684
IM9	9.88	0.100	0.994	0.671	0.451
IM10	12.50	0.098	1.225	0.795	0.632
IM11	12.02	0.099	1.184	0.813	0.661
IM12	13.15	0.085	1.120	0.819	0.671
IM13	12.50	0.094	1.171	0.827	0.684
IM14	11.63	0.109	1.262	0.848	0.719
OM1	*	*	1	0.861	0.742
OM2	18.01	0.058	1.047	0.803	0.645
OM3	22.53	0.045	1.017	0.840	0.706
OM4	15.59	0.069	1.072	0.799	0.638
OM5	16.50	0.069	1.134	0.850	0.723
OM6	18.60	0.063	1.177	0.886	0.785
OM7	15.83	0.070	1.115	0.864	0.747
OM8	20.20	0.060	1.213	0.915	0.837
OM9	17.48	0.064	1.123	0.872	0.760
OM10	18.09	0.063	1.133	0.889	0.790
OM11	18.89	0.062	1.178	0.917	0.840
OM12	14.09	0.070	0.986	0.824	0.680
OM13	17.87	0.064	1.142	0.858	0.737
OM14	16.01	0.072	1.150	0.871	0.758
OM15	16.07	0.076	1.220	0.884	0.782
IM <-> IM	6.18	0.097			
OM <-> OM	7.39	0.189			
IM <-> OM	5.21	0.087			

Note. * = p > 0.05. S-Bχ^2 – Satorra-Bentler scaled chi-square; Y-Bχ^2 – Yuan-Bentler residual-based test statistic; RF – Yuan-Bentler residual-based *F*- statistic; NNFI – Bentler-Bonett non-normed fit index (> 0.9 acceptable); IFI – Bollen's fit index (> 0.9 acceptable)

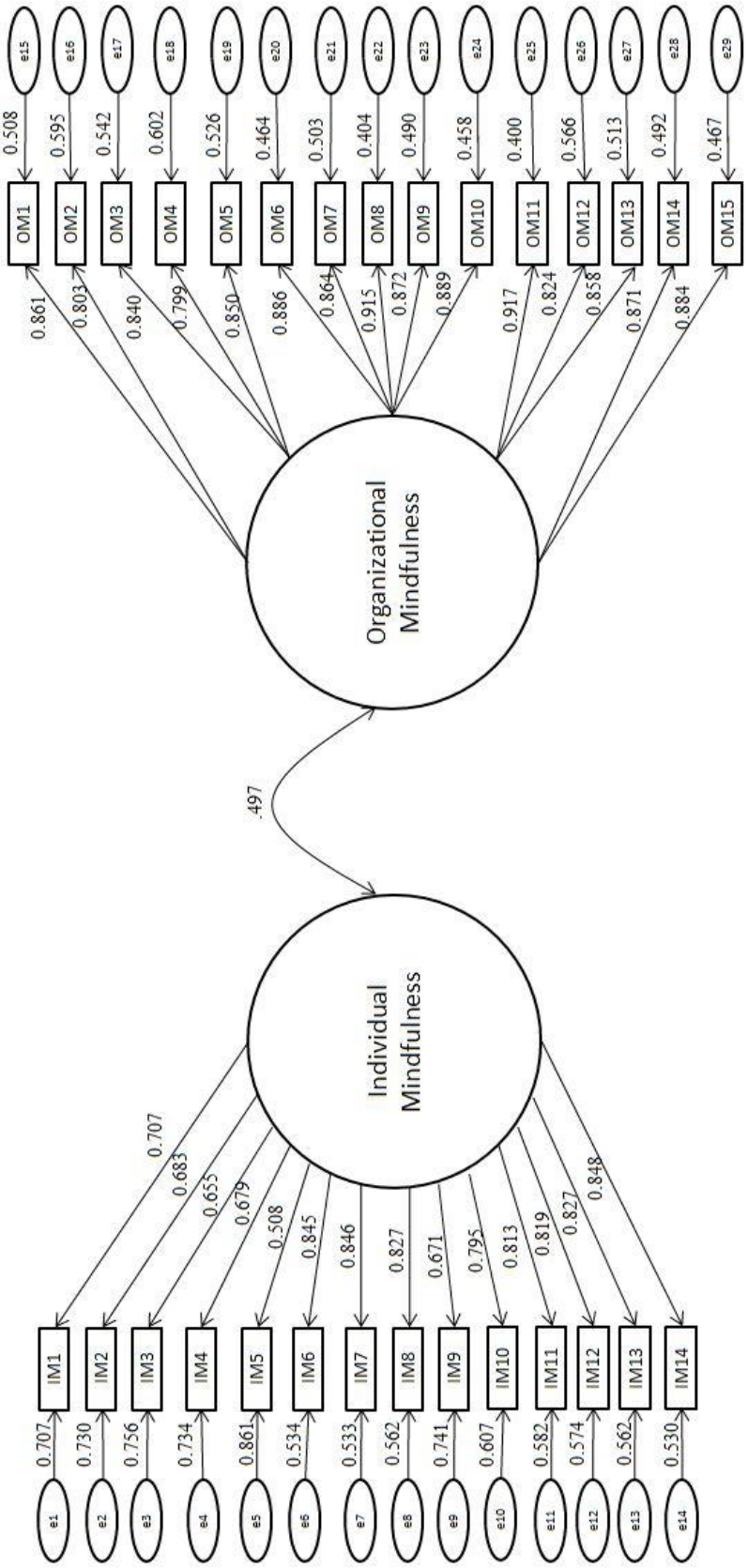

Figure 3. Confirmatory factor analysis with standardized latent variable and error loadings for initial 29-item MaW scale.

Follow-up Exploratory Factor Analysis

To reduce the overall degrees of freedom and to attempt to improve the fit of the model, an additional principal components analysis using oblimin rotation with Kaiser normalization was performed to assess which of the 29 items were contributing to the poor fit and to help reduce the number of items even further. The number of factors was held to two to clarify the analysis. Results of the follow-up analysis are included in Table 10.

To attempt to improve the fit of the proposed bi-dimensional model, any IM that loaded above .36 on the first factor (OM) were removed from the analysis. Additionally, the number of OM items was reduced to 5, with one item retained for each of the five "dimensions" of organizational mindfulness. As all OM items fit well onto the proposed OM factor and had good variability, items were selected based on the judgment of the researcher that best captured each of the five "dimensions" of OM (PS, RS, SO, CR, and DE). Each item was considered, and one item that tapped most directly into each of these five "separate" constructs was retained to preserve the integrity of the five-factor conceptualization at the base of OM.

This process resulted in 6 items for IM and 5 items for OM, and loadings for these items are indicated in bold in Table 11**.** This reduction in total items from 29 to 11 also reduced the number of possible degrees of freedom for the confirmatory factor analysis, increasing the likelihood of a good fit for the bi-dimensional model. Reducing the number of items also increases practicality and usefulness of the scale as an 11-item scale is easier to use as it takes less time to complete.

Table 10
Descriptive Statistics and PCA Following Initial Poor Fit for CFA

	M	*SD*	*Factor* 1	2
Factor Eigenvalue			14.98	4.98
% of variance			51.65%	17.17%
Individual Mindfulness Items (α = .95)				
I can focus directly on my work task without being distracted by thoughts.	5.27	1.092	0.390	0.748
I can focus directly on my work without being distracted by feelings.	5.38	1.110	0.417	0.717
I am able to return to work after losing track because of some distracting thought or feeling.	5.49	1.256	0.257	**0.708**
I am able to pay direct attention to my work.	5.78	1.028	0.342	**0.725**
I am aware of what is happening around me when working.	5.49	1.228	0.296	**0.545**
I feel present when doing work tasks.	5.73	1.102	0.419	0.853
I am aware of what I am doing when working.	5.85	1.143	0.396	0.853
When working, I experience my thoughts clearly.	5.64	1.126	0.437	0.833
When talking to coworkers, I try to understand their needs.	5.51	1.143	0.353	**0.696**
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.	5.48	1.190	0.342	**0.813**
When interacting with coworkers, I am able to listen without being distracted by emotions.	5.53	1.125	0.393	0.829
I am able to listen to coworkers attentively when interacting.	5.67	1.057	0.375	0.826
When talking to a coworker, I hear what they are saying clearly and directly.	5.67	1.094	0.423	0.829
I feel present when interacting with coworkers.	5.76	1.150	0.355	**0.841**
Organizational Mindfulness Items (α = .98)				
My workplace directly addresses work-related problems as they arise.	5.07	1.371	0.786	0.163
My workplace uses mistakes as an opportunity to improve.	4.87	1.539	0.898	-0.032
My workplace actively addresses mistakes as they arise.	5.08	1.430	0.831	0.061
My workplace welcomes a diversity of views and opinions from employees.	5.03	1.585	**0.837**	0.038
My workplace appreciates employees' perspectives.	4.88	1.575	0.883	-0.032
My workplace actively addresses small problems before they become big problems.	4.72	1.570	**0.879**	-0.013
My workplace plans ahead to make sure employees have what they need when they need it.	4.89	1.523	**0.836**	-0.024
My workplace attends to problems directly.	5.02	1.566	**0.817**	0.082
My workplace is forward-thinking in its strategy.	4.92	1.522	0.905	-0.002
My workplace makes decisions based on appropriate analysis.	5.03	1.505	0.850	-0.002
My workplace uses the best possible information to solve problems.	4.96	1.518	0.887	0.043
My workplace changes its approach to problems when the need arises.	5.05	1.413	0.828	0.091
My workplace values respect for others.	5.32	1.572	0.806	0.059
My workplace uses the right person for the job.	4.82	1.560	**0.878**	-0.038
My workplace views the success of all employees as important for the success of the organization.	4.98	1.630	0.917	-0.102

**Note:* The factor loadings are based on a principal component analysis using oblimin rotation with Kaiser normalization. Factor loadings in bold indicate items that were retained for the second round of confirmatory factor analysis.

Table 11

Descriptive Statistics and Factor Loadings of Final MaW scale

	M	*SD*	*Factor* 1	*Factor* 2
Factor Eigenvalue			14.98	4.98
% of variance			51.65%	17.17%
Individual Mindfulness Items (α = .85)				
I am able to return to work after losing track because of some distracting thought or feeling.	5.49	1.256	0.257	**0.708**
I am able to pay direct attention to my work.	5.78	1.028	0.342	**0.725**
I am aware of what is happening around me when working.	5.49	1.228	0.296	**0.545**
When talking to coworkers, I try to understand their needs.	5.51	1.143	0.353	**0.696**
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.	5.48	1.190	0.342	**0.813**
I feel present when interacting with coworkers.	5.76	1.150	0.355	**0.841**
Organizational Mindfulness Items (α = .94)				
My workplace welcomes a diversity of views and opinions from employees.	5.03	1.585	**0.837**	0.038
My workplace actively addresses small problems before they become big problems.	4.72	1.570	**0.879**	-0.013
My workplace plans ahead to make sure employees have what they need when they need it.	4.89	1.523	**0.836**	-0.024
My workplace attends to problems directly.	5.02	1.566	**0.817**	0.082
My workplace uses the right person for the job.	4.82	1.560	**0.878**	-0.038

**Note:* The factor loadings are based on a principal component analysis using oblimin rotation with Kaiser normalization. Factor loadings in bold indicate items that were retained for the validation analysis.

Follow-up Confirmatory Factor Analysis

The 11-item MaW was then assessed for confirmatory factor analysis using structural equation modeling with EQS. Again, IM and OM factors were allowed to covary, and the 6 remaining IM items were loaded onto the IM factor while the 5 remaining OM items were loaded onto the OM factor. Robust methods were again used for assessment purposes because of the non-normality of the data.

Unlike the initial CFA, this follow-up CFA indicated a good fit overall for the bi-dimensional nature of the MaW. The overall model resulted in a non-significant Satorra-Bentler scaled chi-square ($S\text{-}B\chi 2 = 56.82$, $df = 43{,}175$, $p < .05$) with acceptable fit indices for non-normal data (NNFI = .93; IFI = .94) according to previous research (Moss, 2009). Results of this analysis are presented in Table 12 and a visual image with standardized loadings of the items onto the factors including errors is presented in Figure 4. As the 11-item MaW seemed to fit well, this set of items was used for the following validation analysis. However, as the measure was not delivered solely as the 11-item measure and was presented to participants as a 29-item measure, an additional CFA was performed during the third study to further confirm the good fit of this bi-dimensional factor structure.

Table 12

Robust Methods Test Statistic, Robust Methods Standard Error, Unstandardized Loading Estimates, Standardized Solution with Coefficient of Determination, and Robust Goodness of Fit Indices for 11-item MaW with IM and OM as Latent Variables

	Y-Bχ2	*RF*	*df*	*NNFI*	*IFI*
Model fit	56.82*	1.46*	43, 157	0.93	0.94
	Test stat.	*SE*	*B*	*β*	R^2
IM1	*	*	1	0.593	0.351
IM2	9.88	0.82	0.808	0.585	0.343
IM3	6.31	0.13	0.818	0.496	0.246
IM4	8.44	0.13	1.123	0.732	0.535
IM5	9.49	0.13	1.255	0.884	0.781
IM6	9.19	0.14	1.289	0.834	0.696
OM1	*	*	1	0.773	0.598
OM2	15.27	0.075	1.145	0.894	0.799
OM3	14.96	0.072	1.081	0.871	0.756
OM4	18.43	0.065	1.203	0.941	0.886
OM5	14.22	0.076	1.082	0.853	0.723
IM <-> IM	4.74	0.117			
OM <-> OM	6.68	0.225			
IM <-> OM	4.06	0.094			

Note. * = p > 0.05. S-Bχ^2 – Satorra-Bentler scaled chi-square; Y-Bχ^2 – Yuan-Bentler residual-based test statistic; RF – Yuan-Bentler residual-based *F*- statistic; NNFI – Bentler-Bonett non-normed fit index (> 0.9 acceptable); IFI – Bollen's fit index (> 0.9 acceptable)

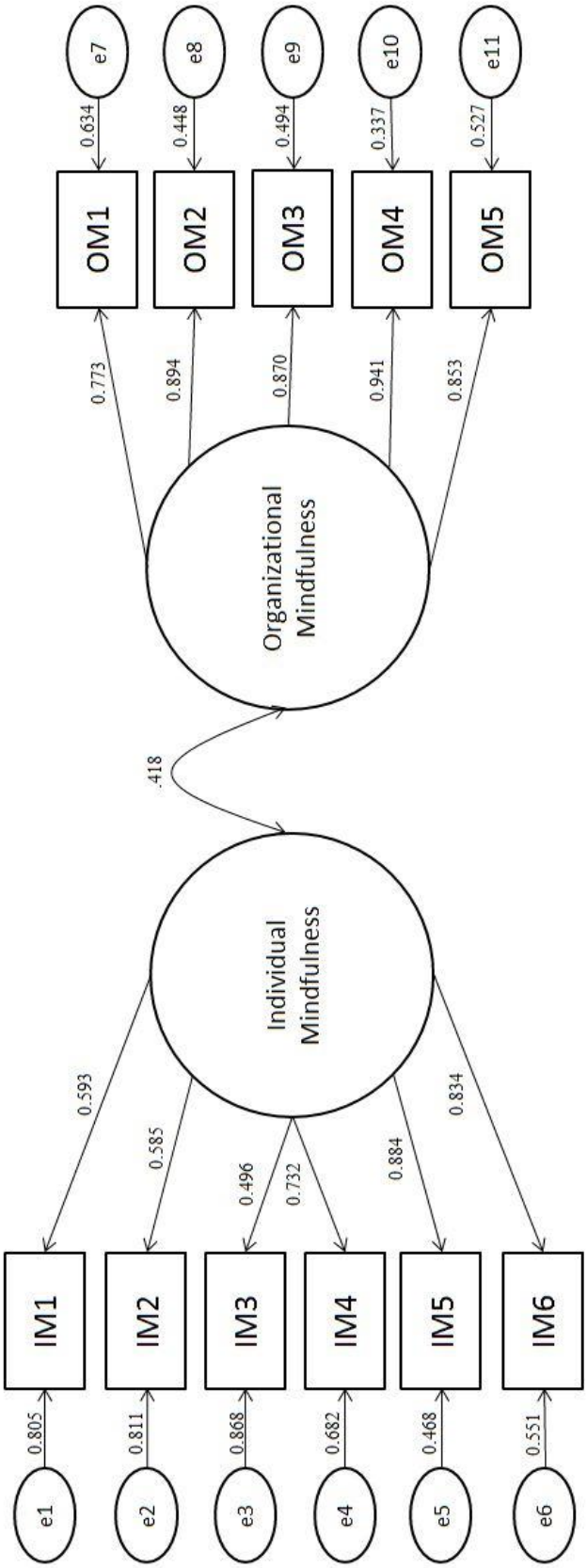

Figure 4. Confirmatory factor analysis with standardized latent variable and error loadings for final 11-item MaW scale.

Validation Analyses

Because of the non-normal nature of much of the data, Spearman's rho was calculated using the 11-item MaW to assess the relationship between IM and OM and the measures described above that were selected for validation. Full correlations across all of the validation measures are presented in Table 13. Due to non-normality, correlations were calculated with Spearman's rho. Some specific relationships and their implications are discussed below.

Several relevant relationships were uncovered between the IM and OM and the selected validation measures. The implications of these relationships will be discussed in detail below. IM and OM had a moderate positive relationship (ρ = .404). MAAS and IM had a strong positive relationship (ρ = .521). The MAAS and OM had a moderate positive relationship (ρ = .405). Active and empathic listening had a strong positive relationship with IM (ρ = .506) and moderate positive relationship with OM (ρ = .361). OM and the preexisting OM measure (Ray et al, 2011) had a very strong positive relationship (ρ = .827). IM and the preexisting OM measure also had a moderate positive relationship (ρ = .395). Relationship satisfaction had a strong positive relationship with OM (ρ = .644) and a moderate positive relationship with IM (ρ = .462). OCBs were moderately positively related to IM (ρ = .336) and OM (ρ = .309). Person-focused OCB relationships had a small positive relationship to OM (ρ = .201) and a moderate positive relationship with IM (ρ = .316). Organization-focused OCBs were moderately positively related with IM (ρ = .309) and OM (ρ = .368). Flow had a strong positive relationships with both IM (ρ = .644) and OM (ρ = .549). Positive affect was moderately positively related to IM (ρ = .434) and OM (ρ = .436). Negative affect was moderately negatively

related to IM (ρ = -.431) and OM (ρ = -.462). Self-monitoring had no significant relationship with IM or OM (ρ = -.006). IM was moderately positively related with emotional stability (ρ = .442) and conscientiousness (ρ = .472), and had a small positive relationship with extraversion (ρ = .212). OM also had a moderate positive relationship with emotional stability (ρ = .456), but had only small positive relationships to conscientiousness (ρ = .227) and extraversion (ρ = .189). Organizational commitment had a moderate positive relationship with IM (ρ = .362) and strong positive relationship with OM (ρ = .647). Job satisfaction had a moderate positive relationship with IM (ρ = .316) and a strong positive relationship with OM (ρ = .651). Organizational psychological safety was moderately positively related with IM (ρ = .359) and strongly positively related with OM (ρ = .725). Perceived organizational support was moderately positively related to IM (ρ = .413) and a strongly positively related with OM (ρ = .787).

Table 13

Correlations Among Study Variables for MaW Validation

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. IM	5.62	0.86	-																											
2. OM	4.90	1.40	.404**	-																										
3. MAAS	5.26	1.04	.521**	.405**	-																									
4. AELS	5.42	0.87	.506**	.361**	.322**	-																								
5. ROM	4.81	1.11	.395**	.827**	.357**	.439**	-																							
6. PF	4.45	0.92	.274**	.676**	.235**	.388**	.837**	-																						
7. RS	4.68	1.33	.315**	.812**	.341**	.404**	.953**	.788**	-																					
8. SO	5.07	1.28	.471**	.786**	.358**	.449**	.925**	.731**	.848**	-																				
9. CR	4.82	1.12	.322**	.701**	.275**	.364**	.899**	.707**	.811**	.801**	-																			
10. DE	5.15	1.31	.427**	.743**	.316**	.338**	.876**	.619**	.775**	.834**	.793**	-																		
11. RelSat	5.41	1.15	.462**	.644**	.376**	.421**	.748**	.594**	.710**	.744**	.612**	.699**	-																	
12. SMS	10.84	4.69	-0.06	-0.06	-0.09	.187**	-0.04	0.05	0.57	-0.02	0.00	-0.08	-0.08	-																
13. OCB	4.57	1.13	.336**	.309**	0.08	.391**	.461**	.392**	.395**	.478**	.466**	.360**	.409**	0.03	-															
14. OCB-O	4.53	1.21	.309**	.368**	0.12	.323**	.498**	.424**	.448**	.500**	.499**	.391**	.422**	0.00	.939**	-														
15. OCB-P	4.62	1.20	.316**	.201**	0.04	.407**	.356**	.304**	.279**	.390**	.369**	.272**	.332**	0.05	.928**	.751**	-													
16. OrgCom	5.19	1.61	.362**	.647**	.282**	.315**	.726**	.586**	.700**	.680**	.642**	.650**	.667**	-0.01	.490**	.547**	.373**	-												
17. Flow	4.69	0.89	.644**	.549**	.464**	.440**	.559**	.408**	.487**	.568**	.487**	.579**	.564**	-0.06	.408**	.437**	.331**	.608**	-											
18. FlowAbs	4.13	0.84	.375**	.470**	.221**	.305**	.514**	.395**	.472**	.498**	.480**	.499**	.430**	0.00	.355**	.396**	.274**	.618**	.800**	-										
19. FlowVal	3.92	1.21	-.162*	0.00	-.280**	0.00	-0.03	-0.07	-0.02	-0.02	-0.04	-0.04	-0.12	0.04	0.12	.163*	0.08	0.06	-0.03	0.05	-									
20. FlowFlu	5.07	1.06	.689**	.503**	.504**	.441**	.492**	.353**	.415**	.512**	.412**	.528**	.547**	-0.08	.362**	.386**	.292**	.510**	.956**	.605**	-0.06	-								
21. NegAff	2.06	0.90	-.431**	-.462**	-.552**	-.247**	-.422**	-.310**	-.423**	-.413**	-.348**	-.392**	-.469**	0.03	-0.13	-.151*	-0.09	-.391**	-.526**	-.371**	.306**	-.515**	-						
22. PosAff	4.66	1.13	.434**	.436**	.257**	.445**	.485**	.374**	.452**	.460**	.443**	.422**	.454**	0.05	.531**	.529**	.459**	.615**	.620**	.527**	0.02	.568**	-.345**	-						
23. Consc	5.85	1.10	.472**	.227**	.460**	.237**	.220**	0.12	.165*	.254**	.195**	.247**	.312**	-0.06	.263**	.287**	.199**	.301**	.508**	.215**	-0.10	.576**	-.383**	.415**	-					
24. EmoStab	5.39	1.54	.442**	.456**	.465**	.369**	.471**	.329**	.463**	.446**	.404**	.411**	.511**	-0.03	.224**	.277**	0.13	.489**	.566**	.416**	-.157*	.552**	-.655**	.514**	.388**	-				
25. Extra	3.90	1.83	.212**	.189**	.246**	.254**	.258**	.286**	.211**	.252**	.255**	.140*	.247**	.284**	.298**	.278**	.290**	.310**	.316**	.313**	-.168*	.281**	-.267**	.458**	.153*	.377**	-			
26. JobSat	5.22	1.78	.319**	.651**	.318**	.247**	.739**	.587**	.725**	.678**	.647**	.672**	.712**	-0.08	.344**	.413**	.222**	.788**	.564**	.590**	-0.03	.469**	-.468**	.501**	.227**	.515**	.225**	-		
27. POS	5.01	1.49	.413**	.787**	.500**	.374**	.804**	.636**	.816**	.762**	.664**	.697**	.733**	-0.07	.276**	.354**	.149*	.721**	.582**	.492**	-0.07	.546**	-.522**	.462**	.356**	.564**	.271**	.749**	-	
28. OPS	5.06	1.34	.359**	.725**	.450**	.323**	.817**	.620**	.829**	.751**	.732**	.722**	.769**	-0.08	.287**	.352**	.170*	.697**	.515**	.465**	-.153*	.466**	-.511**	.422**	.263**	.502**	.265**	.740**	.844**	-

Note. IM: Individual mindfulness at work. OM: Organizational mindfulness. MAAS: Mindful Attention Awareness Scale. AELS: Active and Empathic Listening Scale. ROM: Ray et al. large organizational mindfulnes measure. PF: Preoccupation with failure. RS: Reluctance to simplify. SO: Sensitivity to operations. CR: Commitment to resilience. DE: Deference to expertise. RelSat: Relationship satisfaction at work. SMS: Self-monitoring scale. OCB: Organizational citizenship behaviors (general). OCB-O: Organizational citizenship behaviors (organization). OCB-P: Organizational citizenship behaviors (person). OrgCom: Organizational commitment. Flow: General flow. FlowAbs: Flow absorption. FlowVal: Flow valence. FlowFlu: Flow fluency. NegAff: Negative affect. PosAff: Positive affect. Consc: Conscientiousness. EmoStab: Emotional stability. Extra: Extraversion. JobSat: General job satisfaction. POS: Perceived organizational support. OPS: Organizational psychological safety * = $p < .05$; ** = $p < .01$ using Spearman's rho.

Discussion

Validation Implications

First off, IM and OM had a moderate relationship, suggesting that the "eastern" and "western" conceptualizations are not as separate as researchers might suggest and lending evidence towards an integrated theory. One of the most important relationships for this validation process was the association between IM and OM and the MAAS (Brown & Ryan, 2003), given the popularity of the MAAS for use in organizational science. The MAAS has a strong positive relationship to IM, but this relationship was not so strong to suggest that the MaW fails to capture something unique above and beyond the MAAS. The MAAS also had a moderate positive relationship with OM, which is not surprising given the link between IM and OM. Active and empathic listening had a strong positive relationship with IM, which was appropriate given the potential links between active listening and the interactional mindfulness included within the IM scale, and moderate positive relationship with OM. However, like the connection between IM and the MAAS, the relationship is not so strong to suggest that the MaW fails to add any uniqueness beyond active and empathic listening. A very strong positive relationship existed between the OM subscale of the MaW and the large measure of OM (Ray et al, 2011), suggesting that the 5-item scale effectively captured the measure unidimensionally and across all five "dimensions". The link between OM and IM was further supported by a moderate positive relationship between the long OM measure and the IM subscale of the MaW.

Results for workplace interactions and behaviours also revealed some intriguing relationships. Interestingly, relationship satisfaction positively related more strongly with

OM than IM, which suggests that relationships are potentially driven more by climate than individual behaviour. OCBs had moderate positive relationships to both IM and OM when considered unidimensionally. When taken as sub-dimensions, person-focused OCB relationships were small and positive for OM even though they were moderate and positive for IM, which makes sense given the person-focused behaviour captured in the interactional aspects of the IM subscale. Organization-focused OCBs had moderate positive relationships for IM and OM. This type of OCB had a higher correlation with OM than IM, which is not surprising given the organizational focus of the OM items. Another interesting finding was that flow had strong relationships with both IM and OM, further establishing the paradoxical mystery of whether or not flow and mindfulness can occur simultaneously. Clearly these constructs are related, but the fact that the MaW relates more strongly with flow than another mindfulness measure suggests that the experience of mindfulness at work has different qualities than mindfulness outside of the work context.

In terms of individual differences like affect and personality, results aligned with previous mindfulness research. Positive affect had a moderate positive relationship with IM, which was appropriate given past research on the link between traditional mindfulness and positive affect. However, the similar moderate positive relationship between positive affect and OM was interesting and suggests that organizational mindfulness might play a role in employee well-being in addition to traditional individual-level conceptualizations of mindfulness. Similarly, the MaW showed moderate negative relationships to negative affect for both the IM and OM subscales, with OM, once again, having a stronger negative relationship than IM on negative affect.

This negative relationship was expected for IM, but the OM finding again suggests that OM could contribute to individual well-being along with IM. As a trait characteristic, the self-monitoring scale served as a strong discriminant validator with no correlations for both IM and OM, a finding that lines up with previous research on self-monitoring and mindfulness. Personality findings also aligned with previous research at the IM level, as IM had a moderate positive relationship with emotional stability and conscientiousness, along with a small positive relationship to extraversion. OM had a similar moderate relationship with emotional stability, but had only small relationships to conscientiousness and extraversion.

Lastly, there were some interesting findings in the relationships between the MaW and various workplace attitudes. Organizational commitment was moderately positively related to IM and strongly positively related to OM, a finding which is again not surprising given the organizational nature of the OM subscale. Job satisfaction also had similar results with a moderate positive relationship to IM and a strong positive relationship to OM. Perceived climate factors also aligned more strongly with OM than IM. Organizational psychological safety had a moderate positive relationship to IM and a strong positive relationship to OM, again suggesting that OM can contribute to well-being in the form of psychological safety. Perceived organizational support had similar results with a moderate relationship to IM and a strong relationship to OM.

Additional Discussion

This study served two purposes: confirmation and validation. As a confirmatory effort, the results were initially sub-par. However, after further exploration, the item pool was narrowed down to an 11-item measure while retaining the two subscales of

individual and organizational mindfulness. The final measure can be found in Appendix E. This length is ideal for practical applications, as typically employees, managers, and other busy people are not particularly interested in completing long surveys. In terms of individual mindfulness, the 6-item subscale fulfills the purpose of creating a short, simple, and contextualized way to capture how mindful an individual tends to be when engaging in work behaviour like tasks or interactions with others. This subscale relates with previous measures of mindfulness, but not so strongly as to suggest that it does not add unique value for the organizational sciences. For organizational mindfulness, the 5-item subscale aligns strongly with the larger, 42-item measure on which it was based, fulfilling the goal of constructing a short, simple measure of this construct. Thus, after the first two studies, the overall measure development goals had been completed.

One potential limitation of this study was the fact that the 29-item measure for which data collected needed to be narrowed down further to achieve a good fit in confirmatory factor analysis. There are divergent opinions on whether or not this approach is appropriate given its post-hoc nature (Schreiber et al., 2006). To address these concerns, a confirmatory factor analysis was also completed for study three to further support these decisions and provide confirmation of the behaviour of the subscales when the measure is taken as an 11-item measure instead of as a 29-item measure.

Several interesting implications were discovered during the validation process. Individual and organizational mindfulness seem to be connected, supporting the theory of an integrative framework of mindfulness at work. Many findings, such as the relationship between individual mindfulness and personality, affect, and job satisfaction

were not surprising. However, the complementary nature of organizational mindfulness, particularly in relation to potential well-being outcomes like positive affect, psychological safety and positive psychological properties like flow suggest that organizational mindfulness can be a valuable assessment in the realms of occupational health. Although this set of validation measures was explicitly developed to be non-clinical in nature, as clinical items can change the tone of a survey and by extension the nature of the responses, future validation around anxiety, depression, resilience, and burnout should examine any differential relationships between organizational and individual mindfulness.

Perhaps future research might point to organizational mindfulness as a strong companion to individual mindfulness for promoting and supporting employee well-being. Similarly, relationships of organizational mindfulness to organizationally relevant attitudes like commitment and satisfaction suggest that this higher-order mindfulness can have a stronger impact than individual mindfulness on employee performance, motivation, turnover, and other outcomes relevant to organizational strategy. Taken together, these validation findings begin to paint a picture of related but mutually beneficial constructs that can have positive impacts on a variety of organizationally relevant domains.

Chapter 5: Study 3 - Cross-lagged Panel Design with Supporting Factor Analysis

The final study in the series explored the impact of organizational mindfulness on individual mindfulness at work and vice versa while also considering the impact of contextual factors like leadership and organizational support on these effects. The study utilized a cross-lagged panel design to explore these effects, employing three sampling periods with the same participants. This design was chosen to make longitudinally informed inferences about the various impacts of organizational mindfulness (OM) and individual mindfulness (IM) at work on each other (Finkel, 1995; Williams & Podsakoff, 1989). The research also explored ethical leadership (EL) and perceived organizational support (POS) as possible contextual factors that influence these processes. This research design demanded 400 total observations, or at least ~133 final participants who completed all three stages of the study (Kim & Mueller, 1978).

This study had two goals. The first goal was a continuation of the psychometric analyses of the first two studies, except this time the aim was to assess test-retest reliability of the MaW while again testing the bi-dimensional structure with a CFA using structural equation modeling on the new sample. The second goal of the study was to begin to explore some of the effects of individual mindfulness on organizational mindfulness and vice versa. Because the study was exploratory, and there was reason to believe that there would be reciprocal effects of individual and organizational mindfulness, *I hypothesized that organizational mindfulness would have a positive effect on individual mindfulness over time,* and *that individual mindfulness would have a positive effect on organizational mindfulness.*

In addition to using the 11-item MaW, the study examined the mediating effects of ethical leadership (EL, M. E. Brown, Treviño, & Harrison, 2005) and perceived organizational support (POS, Eisenberger, Huntington, Hutchison, & Sowa, 1986) on the effects of IM on OM and vice versa. Social learning theory suggests that fairness and support on the part of management or leadership in the work environment trickle down and impact behaviours of employees through emulation of leadership behaviours (Bandura, 1971). Perceptions of ethical leadership have been shown to impact multiple levels of group functioning and can increase citizenship behaviours and reduce deviance (Mayer, Kuenzi, Greenbaum, Bardes, & Salvador, 2009). Ethical leadership has also been linked with feelings of psychological safety as well as increased employee voice through seeking opinions from employees about fairness in the workplace and work-related issues (Walumbwa & Schaubroeck, 2009). These connections could be salient and to the presence of interpersonal mindfulness in the workplace because of the importance of openness and direct experience to the mindfulness construct. Similarly, the presence of EL could promote precise, discerning, and contextualized action as suggested by a "western" mindfulness conceptualization (Langer, 1989). Therefore, *I hypothesized that EL would mediate the effect of individual mindfulness at work on organizational mindfulness and vice versa*.

Similarly, organizational support theory states that employees personify the organization and develop unique perceptions about the role of the organization in facilitating work outcomes (Eisenberger et al., 1986). Studies have found that high POS contributes to job satisfaction, work-related affect, and lessened withdrawal behaviours (Rhoades & Eisenberger, 2002). Given the connection between organizational support

and employee cognitions and behaviours, there could be a link between POS and mindfulness at work. Therefore, *I hypothesized that POS would mediate the effect of individual mindfulness at work on organizational mindfulness and vice versa*. The overall model guiding this set of hypothesis is Figure 2, which is included again below.

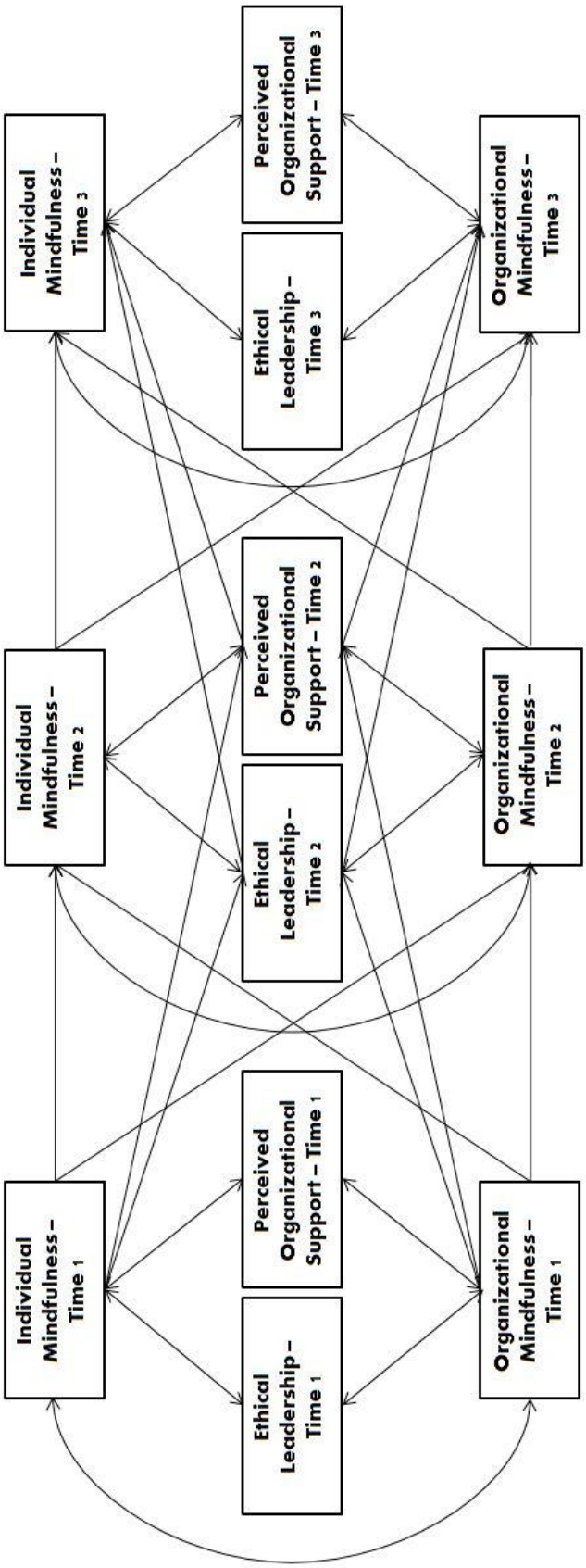

Figure 2. Model for analysis of direct and indirect effects of individual mindfulness and organizational mindfulness with ethical leadership and perceived organizational support as mediators.

Additionally, as the study was exploratory, *several post hoc analyses were completed to test how these various construct impact each other, if at all*. All inferential analyses for study 3 were tested using structural equation modeling. Several models were tested to infer the best-fitting model according to the data.

Results of this study, results of the measure development process of studies one and two, and discussions of the implications of the findings across all three studies are provided in Chapters 3-5. Although discussions are included for each chapter, a general discussion is provided in Chapter 6.

Method

Participants

Participants were once again recruited from Amazon's MTurk worker pool. Because of the attrition to be expected in any longitudinal design, the initial sample contained 312 responses. Participants were informed about the longitudinal nature of the study and final responses used for model testing completed all three phases. Participants needed to meet the same eligibility criteria as the previous two studies (at least part time work in a social work setting in the last six months). Participants from phase one (n = 248) were used for follow-up confirmatory factor analyses.

Responses were scanned for data quality. Participants who provided responses that were completed too quickly (<120 seconds for phase 1, <90 seconds for phases 2 and 3) or that failed the attention check questions ("My boss/supervisor asks me to check neutral to make sure I am paying attention to help this research") were not invited back to the following phase. A total of 232 respondents were invited to complete the second phase, and 180 invited for the third phase, resulting in a total of 152 participants that

successfully completed all three phases with adequate data that met the above criteria for quality.

Procedure

Participants completed an online survey consisting of the 11-item MaW measure as well as the contextual measures described below. Participants completed an informed consent form before gaining access to each phase of the survey. During the first stage of the study, participants provided demographic information on age, biological sex, race, ethnicity, full-time/part-time employment, industry, hours worked per week, whether or not they actively practiced any form of mindfulness, how long they have been practicing mindfulness in years, and how important mindfulness was to them on a 5-point scale. To test effects over time, follow-up surveys were sent out at three and six weeks following the initial survey. Follow-ups contained the same items as the first survey but did not include demographic questions in order to decrease survey completion time. Demographic information for participants is presented in Table 14.

Table 14

Demographic Characteristics of Final Participants for Cross-lagged Study

Age	*n*	%
19-24	11	7.2%
25-29	28	18.4%
30-34	37	24.3%
35-39	22	14.5%
40-44	11	7.2%
45-49	15	9.9%
50-54	9	5.9%
55-59	9	5.9%
60+	10	6.6%

Sex	*n*	%
Female	82	53.9%
Male	70	46.1%

Race	*n*	%
Asian	9	5.9%
Black	6	3.9%
Two or more races	6	3.9%
White	131	86.2%

Ethnicity	*n*	%
Hispanic	7	4.6%
Non-Hispanic	193	127.0%

Full time/Part time	*n*	%
Full-time	118	77.6%
Part-time	34	22.4%

Hours worked per week	*n*	%
20	9	4.5%
21-25	4	2.0%
26-30	12	6.0%
31-35	9	4.5%
36-40	74	37.0%
41-45	21	10.5%
46-50	10	5.0%
50+	13	6.5%

Mindfulness practice	*n*	%
No	100	65.8%
Yes	52	34.2%

Mindfulness years		
Less than one	*n*	%
1-2	17	32.7%
3-6	14	26.9%
7-10	8	15.4%
11-15	1	1.9%
15+	9	17.3%

Mindfulness importance	*n*	%
1	6	11.5%
2	16	30.8%
3	20	38.5%
4	10	19.2%
5	0	0.0%

After completion of the initial study, participants were informed that they would be contacted for the follow-up studies three and six weeks after the initial survey phase. The study was expected to take approximately five minutes to complete, with the first phase taking the most time due to the additional demographic questions. Participants for the first phase of the study were compensated at the rate of 10 cents CAD/minute (~.40 cents USD). To encourage future participation and to limit attrition, incentives for the second and third phase were raised to 15 cents CAD/minute (~60 cents USD) and 20 cents CAD/minute (~.80 cents USD) respectively. To maintain anonymity, participants were contacted for follow-up surveys using TurkPrime (Litman et al., 2017), an independent 3rd party platform that anonymizes MTurk workers and allows for follow-up without any identifying info (names, email addresses, etc.). Only participants with acceptable responses that met the criteria describe above for all three phases were retained for the final analyses. Even so, all participants were compensated for their efforts at each stage.

Materials

Participants completed all three phases of the study using the Qualtrics platform. The following measures were included at all three time points. A copy of the phase one survey is included in Appendix F. Means across all items, standard deviations, reliability estimates, skewness, kurtosis, and tests for normality for each variable at each of the three phases are included in Table 15. As data were once again non-normal, non-parametric correlations (Spearman's rho) between the variables at all three time points are presented in Table 16.

Table 15

Descriptive Statistics, Reliability Estimates, Skewness, Kurtosis, and Tests of Non-normality of Observed Study Variables Across Time.

						Shapiro-Wilk Test	
Measure	*M*	*SD*	*α*	Skewness	Kurtosis	Stat.	Sig.
IM - time 1	5.77	0.76	0.84	-0.506	-0.040	0.968	0.001
IM - time 2	5.70	0.72	0.84	-0.127	-0.011	0.974	0.006
IM - time 3	5.71	0.78	0.86	-0.610	0.937	0.963	0.000
OM - time 1	5.08	1.18	0.92	-0.641	0.052	0.964	0.000
OM - time 2	4.97	1.27	0.93	-0.651	0.066	0.961	0.000
OM - time 3	5.02	1.29	0.94	-0.686	0.155	0.956	0.000
POS - time 1	5.05	1.48	0.96	-0.764	-0.317	0.925	0.000
POS - time 2	5.01	1.58	0.97	-0.705	-0.414	0.928	0.000
POS - time 3	4.96	1.58	0.97	-0.741	-0.328	0.926	0.000
EL - time 1	5.29	1.28	0.95	-1.187	1.040	0.897	0.000
EL -time 2	5.48	1.39	0.96	-1.313	1.371	0.876	0.000
EL - time 3	5.25	1.41	0.96	-1.175	0.697	0.880	0.000

Note. IM: Individual mindfulness at work. OM: Organizational mindfulness. EL: Ethical leadership. POS: Perceived organizational support.

Table 16

Correlations Among Study Variables for Three Phase Cross-lagged Study

	Variable	1	2	3	4	5	6	7	8	9	10	11	11
1.	IM - time 1	-											
2.	IM - time 2	0.67	-										
3.	IM - time 3	0.69	0.73	-									
4.	OM - time 1	0.54	0.51	0.58	-								
5.	OM - time 2	0.50	0.59	0.63	0.79	-							
6.	OM - time 3	0.44	0.55	0.66	0.76	0.85	-						
7.	POS - time 1	0.30	0.39	0.43	0.71	0.74	0.72	-					
8.	POS - time 2	0.32	0.41	0.47	0.66	0.80	0.76	0.85	-				
9.	POS - time 3	0.28	0.42	0.45	0.66	0.77	0.78	0.85	0.90	-			
10.	EL - time 1	0.41	0.44	0.49	0.73	0.69	0.64	0.75	0.71	0.71	-		
11.	EL -time 2	0.34	0.41	0.50	0.68	0.71	0.68	0.72	0.72	0.70	0.84	-	
12.	EL - time 3	0.35	0.41	0.52	0.65	0.68	0.73	0.73	0.73	0.74	0.84	0.83	-

Note. IM: Individual mindfulness at work. OM: Organizational mindfulness. EL: Ethical leadership. POS: Perceived organizational support. All correlations are significant ($p < .01$).

Mindfulness at work. Exploring the MaW scale developed during the previous studies, particularly the effects of OM on IM and vice versa, was the driving force of the final study. The MaW consists of 11 items, 6 of which focus on individual mindfulness at work, while the other 5 examine organizational mindfulness. Participants were asked to rate the frequency of their experience of mindfulness at work on 7-point scale (1 = never, 7 = always).

Contextual factors. Because of the role that context can play in employee perceptions of the work environment, two measures were used to explore how contextual factors impact IM and OM. Ethical leadership (EL) was chosen because of the impact ethical leaders can have on employee perceptions and behaviour. A ten-item Ethical Leadership Scale (ELS, Brown et al., 2005) was used that asked participants to rate their agreement on various ethical leadership behaviours on a 7-point scale (1 = strongly disagree, 7 = strongly agree). Because of the previously established impact of perceptions of support, or feelings that the organization supports employees, on collective mindfulness, the 8-item measure of perceived organization support implemented for the validation study was once again used (SPOS-8, Eisenberger et al., 1986) with the same 7-point measurement scale as the ELS.

Results

The primary analyses completed for this study used MPlus to execute structural equation models that explored the various effects of OM, IM, POS, and EL on each other in an effort to find a model with good fit. Several models tested just the influence of OM on IM perceptions and vice versa using the cross-lagged design, while several other models included the contextual factors to explore other effects. The analytic process of

this study established constructs as both latent factors retaining the unique variance per item as well as observed variables using average scores across all items in the measure. Based on the exploratory hypothesis, EL and POS were tested as multiple mediators of the effects of IM and OM on each other. Additional post hoc analyses exploring moderated mediation and main effects of these contextual factors were also performed.

Intraclass correlation coefficients. Intraclass correlation coefficients (ICC) were computed to determine whether or not the measures, particularly the new MaW, were internally consistent across time. Results of the ICC indicate that all measures displayed good to excellent test-retest reliability across the three phases of the study. The average measure ICC for IM was .87 with a 95% confidence interval of .827-.901 ($F(151,302) = 7.60$, $p < .001$), indicating good test-retest reliability. The average measure ICC for OM was .93 with a 95% confidence interval of .913-.950 ($F(151,302) = 15.04$, $p < .001$), indicating excellent test-retest reliability. Contextual factors also showed excellent test-retest reliability. The average measure ICC for POS was .95 with a 95% confidence interval of .939 to .965 ($F(151,302) = 21.49$, $p < .001$) and .96 for EL with a 95% confidence interval of .95 to .97 ($F(151,302) = 26.05$, $p < .001$).

Follow-up CFA. Because the items of the MaW were reduced after the validation data were collected, a follow-up confirmatory factor analysis was performed to further support the bi-dimensional nature of the MaW scale. To do so, data were taken from the first phase of the study as this phase had the largest sample size due to minimal attrition at the outset of the study ($n = 248$). A confirmatory factor analysis was performed on the first phase data using EQS with robust methods for non-normality. Although the Satorra-Bentler chi-square was significant ($\chi 2\ (43) = 126.5$), fit indices

were at acceptable levels for the NNFI (.93) and the CFI (.94). These fit indices suggest adequate fit for the 11-item bi-dimensional MaW despite the significant chi-square results (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Results of the follow-up CFA are presented in Table 17.

Table 17

Follow-up Two Factor CFA for the 11-item MaW

	Y-Bχ2	*df*	*NNFI*	*IFI*
Model fit	126.5	43	0.93	0.94

	Test stat.	*SE*	*β*
IM1	*	*	0.46
IM2	8.30	0.14	0.62
IM3	7.62	0.14	0.55
IM4	7.79	0.22	0.84
IM5	8.14	0.21	0.92
IM6	7.04	0.14	0.82
OM1	*	*	0.66
OM2	9.41	0.15	0.85
OM3	10.87	0.14	0.92
OM4	9.85	0.15	0.90
OM5	9.89	0.13	0.84
IM <-> IM	4.13	0.073	
OM <-> OM	5.65	0.13	
IM <-> OM	4.98	0.053	

Note. S-Bχ^2 – Satorra-Bentler scaled chi-square; NNFI – Bentler-Bonett non-normed fit index (> 0.9 acceptable); IFI – Bollen's fit index (> 0.9 acceptable)

Additionally, given the strong correlations between some of the variables, a follow-up CFA was completed across all four variables of the study (IM, OM, POS, and EL) to validate that the constructs are unique from each other. A four-factor confirmatory factor analysis using EQS with robust methods for non-normality was created to explore the factor behaviour of the variables used in the study, one factor per variable (IM, OM, POS, and EL). Like the MaW follow-up CFA, this analysis was completed using all acceptable phase one responses to ensure the largest sample size for the analysis. All four constructs were allowed to covary. Like the previous analysis, the Satorra-Bentler chi-square was significant ($\chi 2$ (371) = 678.42), but fit indices were at acceptable levels for the NNFI (.92) and the IFI (.93). These findings suggest relative independence between these measures. Results for this CFA are presented in Table 18.

Table 18

Four Factor CFA for the MaW with Contextual Factors

	Y-Bχ2	*df*	*NNFI*	*IFI*
Model fit	678.42	371	0.92	0.93
	Test stat.	*SE*	*β*	
IM1	*	*	0.414	
IM2	7.71	0.16	0.593	
IM3	6.40	0.17	0.505	
IM4	6.75	0.28	0.836	
IM5	7.10	0.27	0.928	
IM6	6.70	0.26	0.833	
OM1	*	*	0.662	
OM2	11.22	0.12	0.835	
OM3	10.55	0.15	0.914	
OM4	9.37	0.16	0.910	
OM5	9.49	0.14	0.855	
EL1	*	*	0.881	
EL2	8.04	0.081	0.547	
EL3	11.39	0.071	0.759	
EL4	18.85	0.062	0.914	
EL5	17.98	0.066	0.958	
EL6	19.45	0.065	0.941	
EL7	10.35	0.085	0.674	
EL8	12.39	0.088	0.872	
EL9	8.30	0.11	0.731	
EL10	13.31	0.077	0.802	
POS1	*	*	0.888	
POS2	13.19	0.082	0.740	
POS3	14.48	0.071	0.826	
POS4	19.10	0.060	0.908	
POS5	19.50	0.060	0.879	
POS6	19.25	0.059	0.916	
POS7	17.53	0.072	0.905	
POS8	17.95	0.057	0.873	
IM <-> IM	3.66	0.063		
OM <-> OM	5.36	0.14		
POS <-> POS	5.90	0.24		
EL <-> EL	7.60	0.22		
IM <-> OM	4.57	0.049		
IM <-> EL	4.45	0.056		
IM <-> POS	4.40	0.053		
OM <-> EL	6.10	0.13		
OM <-> POS	6.56	0.13		
EL <-> POS	6.49	0.19		

Note. S-Bχ^2 – Satorra-Bentler scaled chi-square; NNFI – Bentler-Bonett non-normed fit index (> 0.9 acceptable); IFI – Bollen's fit index (> 0.9 acceptable)

Structural equation models to explore cross-lagged effects of IM and OM.

The primary purpose of this study was to explore how organizational mindfulness impacts individual mindfulness at work and vice-versa. These processes were analyzed using MPlus to explore overall fit indices of various possible models. Because of the non-normality of the data, all analyses used the MLM estimator, a process of "using maximum likelihood parameter estimates with standard errors and a mean-adjusted chi-square test statistic that are robust to non-normality. The MLM chi-square test statistic is also referred to as the Satorra-Bentler chi-square" (Muthén & Muthén, 2005, p. 533). These models were tested initially with potential latent factors, retaining the unique variance and error of each individual item, and then as observed factors, or factors that used the mean score of each scale, in order to find the model of best fit. A summary of the goodness of fit indices and chi-square results for each of these models is included in Table 19.

Table 19
Summary of Goodness of Fit and Chi-Square Results for Cross-lagged Effects Models

	S-Bχ2	*df*	*CFI*	*TLI*
IM <-> OM / Top-down, bottom-up (dual effects, latent)	1669.260	482	0.69	0.66
OM -> IM / Top-down (latent)	1676.260	484	0.69	0.66
OM -> IM / Top- down (observed)	2.44*	4	1.00	1.01
OM -> IM / Top-down, including main effects of contextual factors	39.11*	30	0.99	0.98

Note. * = $p > 0.05$. S-Bχ^2 – Satorra-Bentler scaled chi-square. CFI - Comparitive fit index. TLI - Tucker-Lewis/non-normed fit index.

It was initially proposed that organizational mindfulness would have a direct effect on individual mindfulness at work and that individual mindfulness at work would have a similar impact on organizational mindfulness. This model was tested first. Because of the theoretical influence of perceived organizational factors on individual mindfulness and vice versa, this model was called the *top-down/bottom-up* model. This model was initially explored using latent constructs where the unique variance and error of each item was included in the analysis. After building the latent variables (IM time 1-3 and OM time 1-3), estimates were calculated within each construct (i.e. IM time 1 on IM time 2, etc.) and cross-lagged across constructs (i.e. IM time 1 on OM time 2, OM time 2 on IM time 3). Additionally, IM and OM were allowed to covary. This model presented poor fit reflected by a significant chi-square ($\chi 2$ (482) = 1669.26, $p > .05$) and poor fit indices (CFI = .69, TLI = .66). Despite the poor fit, some clear trends emerged. As expected, IM and OM predicted themselves over time. In addition to these straightforward estimates, significant standardized cross-lagged estimates from OM to IM suggested that OM a direct positive effect on IM over time. However, no significant effects of IM on OM were observed. Standardized estimates for these parameters are presented in Table 20.

Table 20

Standardized Parameter Estimates for Top-Down/Bottom-up Latent Variable Model

	β	*SE*	*p*
IM time 1 -> IM time 2	0.688	0.048	<.001
IM time 1 -> IM time 3	0.259	0.069	<.001
IM time 2 -> IM time 3	0.398	0.075	<.001
OM time 1 -> OM time 2	0.807	0.030	<.001
OM time 1 -> OM time 3	0.243	0.070	<.001
OM time 2 -> OM time 3	0.684	0.074	<.001
IM time 1 -> OM time 2	0.034	0.031	0.28
IM time 2 -> OM time 3	0.049	0.025	0.05
OM time 1 -> IM time 2	**0.157**	**0.056**	**0.005**
OM time 2 -> IM time 3	**0.336**	**0.038**	**<.001**
IM time 1 <-> OM time 1	0.523	0.038	<.001
IM time 2 <-> OM time 2	0.456	0.076	<.001
IM time 3 <-> OM time 3	0.514	0.102	<.001

Note. Model had poor fit ($\chi 2$ (482) = 1669.26). Significant parameter estimates with causal implications are highlighted in bold.

Because of the seeming influence of OM on IM, the next model tested used only the effect of OM on IM without construct covariance, allowing for within-phase parameter estimates of OM to IM. Because this model focused on the impact of organizational mindfulness on individual mindfulness, this model was called the *top-down* model. This model also used a latent variable approach, and, like the top-down/bottom-up model, the resulting model also showed poor fit ($\chi 2$ (484) = 1669.26). However, the pattern of OM influencing IM remained, as reflected in Table 21. Curiously, phase 2 OM no longer had a significant parameter estimate linked to IM time 3, a pattern which was present in the top-down/bottom-up latent model.

Table 21
Standardized Parameter Estimates for Top-Down Latent Variable Model

	β	*SE*	*p*
IM time 1 -> IM time 2	0.684	0.044	<.001
IM time 1 -> IM time 3	0.183	0.070	0.009
IM time 2 -> IM time 3	0.453	0.076	<.001
OM time 1 -> OM time 2	0.831	0.026	<.001
OM time 1 -> OM time 3	0.176	0.082	0.031
OM time 2 -> OM time 3	0.773	0.078	<.001
OM time 1 -> IM time 2	**0.309**	**0.860**	**<.001**
OM time 2 -> IM time 3	0.190	0.160	0.25
OM time 1 -> IM time 1	**0.530**	**0.380**	**<.001**
OM time 2 -> IM time 2	**0.561**	**0.082**	**<.001**
OM time 3 -> IM time 3	**0.580**	**0.156**	**<.001**

Note. Model had poor fit ($\chi 2$ (484) = 1669.26, p < .001). Significant parameter estimates with causal implications are highlighted in bold.

To further test the model, reduce the number of parameters, lower the degrees of freedom, and, ideally, improve the model fit, an observed variable model was tested. In this model, mean scores across all items for each variable were computed and these mean scores were used in the analysis. Based on model fit suggestions from previous MPlus executions, IM and OM were once again allowed to covary to focus the model on the cross-lagged implications of the impact of OM on IM. This model achieved good fit because of the significant reduction in degrees of freedom resulting from using the mean score instead of individual items across measures in the observed model ($\chi 2$ (4) = 2.44, p > .05). Fit indices for the CFI (1.00) and TLI (1.01) were both acceptable. Standardized parameter estimates for the well-fitting observed model are presented in Table 22. A visual depiction of the observed model with parameter estimates is presented in Figure 5. This model was retained and used to argue that perceptions of OM have a direct effect on IM across time.

Table 22

Standardized Parameter Estimates for Top-Down Observed Variable Model

	β	*SE*	*p*
IM time 1 -> IM time 2	0.529	0.068	<.001
IM time 1 -> IM time 3	0.368	0.068	<.001
IM time 2 -> IM time 3	0.321	0.078	<.001
OM time 1 -> OM time 2	0.857	0.047	<.001
OM time 1 -> OM time 3	0.293	0.079	<.001
OM time 2 -> OM time 3	0.677	0.080	<.001
OM time 1 -> IM time 2	0.126	0.033	<.001
OM time 2 -> IM time 3	0.180	0.050	<.001
IM time 1 <-> OM time 1	0.467	0.073	<.001
IM time 2 <-> OM time 2	0.122	0.043	0.004
IM time 3 <-> OM time 3	0.094	0.028	0.001

Note. Goodness of fit results ($\chi 2$ (4) = 2.44, p > .05). CFI = 1.00, TFI = 1.01.

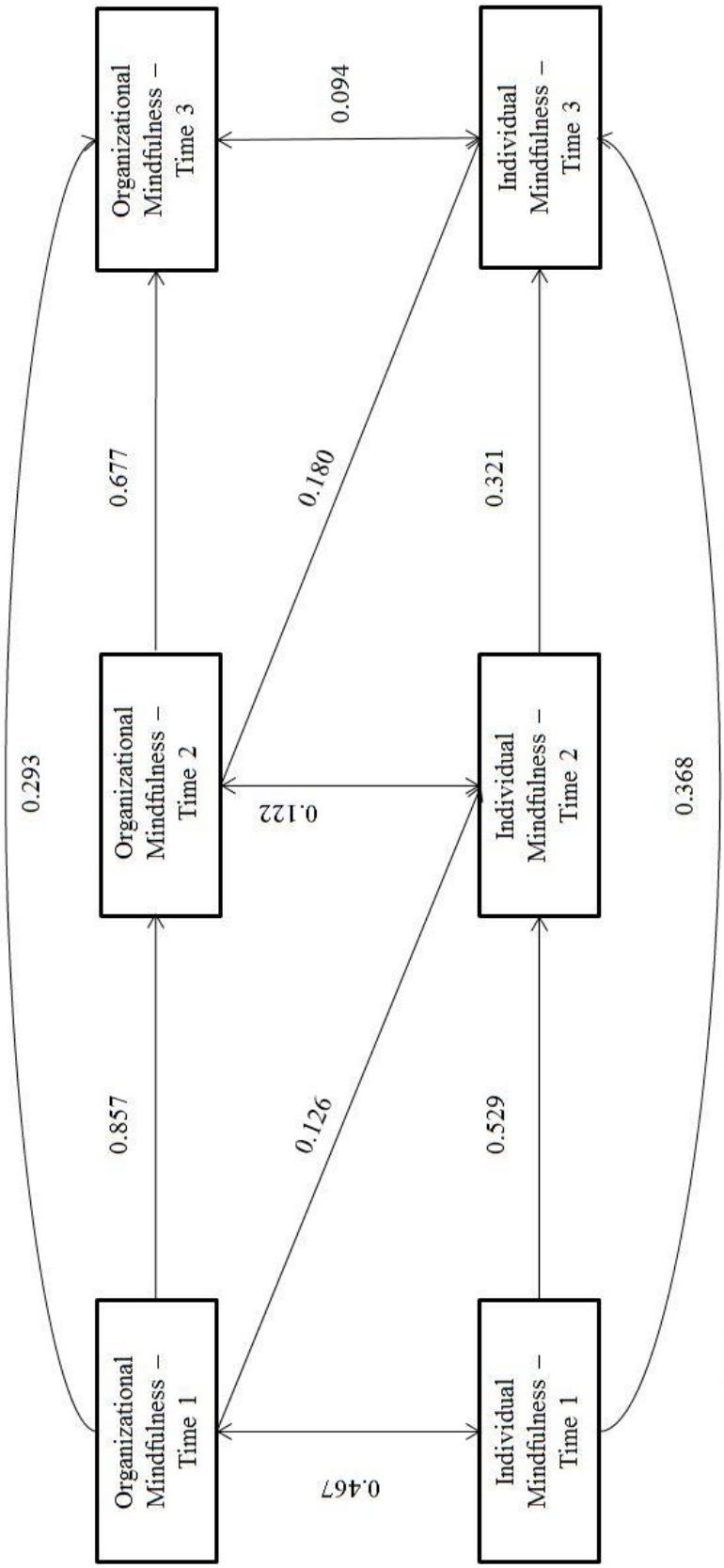

Figure 5. Standardized parameter estimates for cross-lagged effects of organizational mindfulness on individual mindfulness at work. All estimates are significant ($p < .01$).

Contextual factors. The hypothesized contextual factors model proposed that EL and POS would mediate the top-down effects of IM and OM on each other. As the best fitting model from the SEM process indicated, the only significant effects were from OM to IM. Therefore, a model was tested to determine if either of these contextual variables mediated this effect. A structural equation model using MPlus with MLM estimation was used to test for direct and indirect effects with multiple mediators. Like the previous models, estimates were performed within constructs and across time. There were no significant indirect effects of OM on IM through either POS or EL over time. This model presented a significant chi-square ($\chi 2$ (38) = 189.57, p > .05) and goodness of fit indices were unacceptable (CFI = .91, TFI = .84). This model was rejected and the hypothesis of EL and POS acting as multiple mediators was rejected.

However, as the study was inherently exploratory in nature, several post-hoc analyses were performed. A possible interaction between ethical leadership and perceived organizational support was performed, but there were no significant interactions between these constructs across the three phases of the study ($p > .05$). Despite the lack of indirect effects and interactions, there were several direct effects of the context factors on OM that suggested exploring these constructs as main effects.

Therefore, the next post hoc analysis explored POS and EL as main effects on OM. These main effects were tested across all phases (time 1 to time 2, time 2 to time 3) and within the third phase. Previous model parameters were retained (OM impacts IM). Contextual factors were allowed to covary with IM and OM and each other. Parameter estimates were again calculated using the MLM estimator in MPlus. Fit indices for this analysis were acceptable (CFI = .98, TLI = .97), despite a significant chi-square ($\chi 2$ (33)

= 58.12, $p > .05$), suggesting good fit. Parameter estimates indicated main effects of POS on OM from time 1 to time 2, and both EL and POS on OM from time 2 to time 3, in addition to the previously established effects of OM on IM over time. These results are presented in Table 23. Standardized loadings for the post hoc main effects model are presented in Figure 6.

Table 23

Standardized Parameter Estimates for Top-Down Observed Variable Model with Contexual Factors as Main Effects on OM

	β	*SE*	*p*		*β*	*SE*	*p*
Main effects				Covariates			
IM time 2 -> IM time 3	0.338	0.073	<.001	IM time 1 <-> OM time 1	0.467	0.073	<.001
IM time 1 -> IM time 3	0.337	0.062	<.001	IM time 2 <-> OM time 2	0.107	0.030	<.001
OM time 2 -> IM time 3	0.177	0.047	<.001	IM time 3 <-> OM time 3	0.091	0.027	<.001
				POS time 1 <-> OM time 1	0.899	0.130	<.001
IM time 1 -> IM time 2	0.499	0.068	<.001	POS time 1 <-> IM time 1	0.212	0.060	<.001
OM time 1 -> IM time 2	0.131	0.035	<.001	POS time 1 <-> EL time 1	1.047	0.148	<.001
				POS time 2 <-> OM time 2	0.313	0.051	<.001
OM time 2 -> OM time 3	0.518	0.086	<.001	POS time 2 <-> IM time 2	0.028	0.029	0.342
OM time 1 -> OM time 3	0.239	0.066	<.001	POS time 2 <-> EL time 2	0.197	0.068	0.004
POS time 2 -> OM time 3	0.093	0.048	0.048	POS time 3 <-> OM time 3	0.118	0.035	<.001
EL time 2 -> OM time 3	0.084	0.039	0.029	POS time 3 <-> IM time 3	-0.030	0.026	0.246
				POS time 3 <-> EL time 3	0.076	0.037	0.041
OM time 1 -> OM time 2	0.525	0.069	<.001	EL time 1 <-> IM time 1	0.299	0.084	<.001
POS time 1 -> OM time 2	0.515	0.076	<.001	EL time 1 <-> OM time 1	1.071	0.158	<.001
EL time 1 -> OM time 2	0.048	0.062	0.44	EL time 1 <-> POS time 1	1.047	0.149	<.001
				EL time 2 <-> IM time 2	0.005	0.023	0.828
POS time 2 -> POS time 3	0.645	0.074	<.001	EL time 2 <-> OM time 2	0.145	0.046	<.001
POS time 1 -> POS time 3	0.427	0.107	<.001	EL time 3 <-> IM time 3	0.028	0.020	0.163
				EL time 3 <-> OM time 3	0.117	0.030	<.001
POS time 1 -> POS time 2	1.217	0.053	<.001	EL time 3 <-> POS time 3	0.076	0.037	0.04
EL time 2 -> EL time 3	0.619	0.074	<.001				
EL time 1 -> EL time 3	0.361	0.072	<.001				
EL time 1 -> EL time 2	0.948	0.047	<.001				

Note. Goodness of fit results ($\chi 2$ (30) = 39.11, p > .05, CFI = .99, TFI = .98)

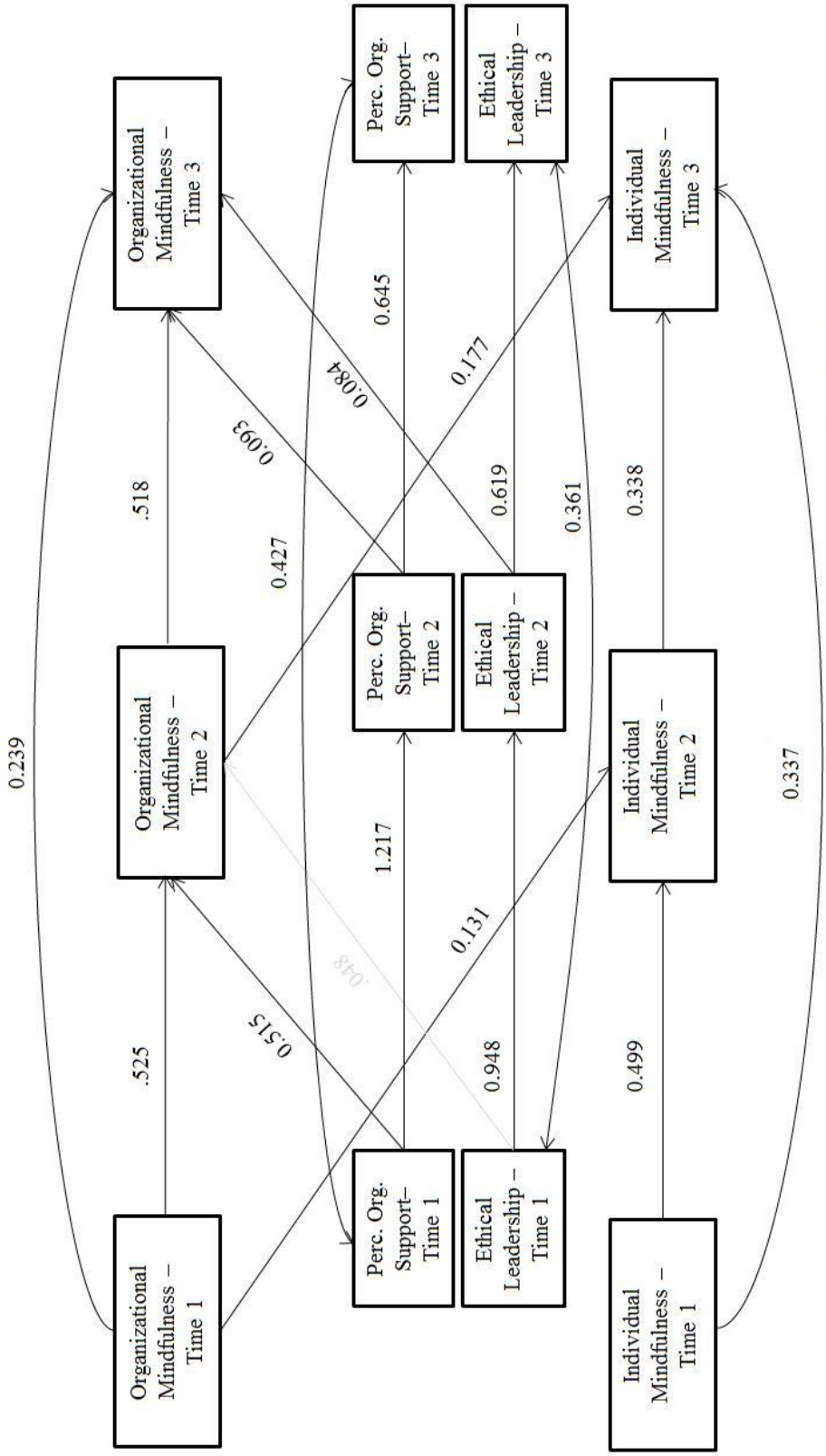

Figure 6. Standardized parameter estimates for cross-lagged effects of organizational mindfulness on individual mindfulness including parameter estimates of contextual factors. Covariates are not included to simplify the figure. Estimates in black are significant ($p < .05$).

Discussion

As this study was exploratory in nature and research of this kind is at its nascent stage, it was no surprise that the proposed hypotheses were not all supported. Looking at the impact of organizational mindfulness on individual mindfulness at work and vice versa was a revealing process. The analysis revealed that while frequency of individual mindfulness at work does not have a consistent impact on perceptions of organizational mindfulness, organizational mindfulness does seem to have positive impact on individual mindfulness at work. These findings are preliminary, but the implications of this discovery are worth exploring.

The results of the study suggest that when employees feel like their workplace makes decisions in line with organizational mindfulness, they tend to experience a more direct and open relationship with their work and their peers in line with individual mindfulness at work. Additionally, exploratory findings revealed that perceived organizational support can promote these perceptions of organizational mindfulness, and that individuals who experience ethical leadership are more likely to feel that the organization acts mindfully. As leadership in this case was phrased as one's immediate boss, these findings suggest that a combination of local and organizational-level perceptions influence how an employee perceives organizational mindfulness and by extension how often they engage in individual mindfulness at work. Even though this study is the first of its kind, these findings suggest that contextual factors do play a role in how individuals perceive organizational mindfulness. Given the impact of organizational mindfulness perceptions on individual mindfulness at work, further contextualized research is needed to clarify the best environment to develop a mindful organization with

mindful employees. Perhaps other forms of leadership (transformational, authentic) will have a more consistent impact on perceptions of organizational mindfulness.

The MaW integrates "eastern" and "western" approaches to mindfulness, and these findings illustrate that these approaches are not separate and that the "western" notion of organizational mindfulness can positively impact its "eastern" counterpart of individual mindfulness at work. It is interesting to see that the construct of organizational mindfulness has such a consistent impact on individual mindfulness at work and that the effect seems to be quite clearly one-way. When taken with the effects of perceived organizational support and ethical leadership, there are clearly organizational factors that influence organizational mindfulness and individual mindfulness as a result.

Practically speaking, these findings suggest that a supportive organization with leaders that make honest decisions using the best information and people possible are the most likely to promote individual mindfulness at work. If the mechanisms of individual mindfulness at work operate similarly to general mindfulness, employees in these types of organizations should be able to manage stress, regulate emotions, and possibly experience higher engagement and performance than non-mindful employees. Future studies should examine the effects of both individual and organizational mindfulness at work on these outcomes, as well as other relevant outcomes resulting from a more mindful workplace.

Chapter 6: General Discussion of the Present Studies

Despite the popularity and prevalence of mindfulness training and practices implemented in the workplace, research into understanding the specifics of how mindfulness at work actually works is still very new. As this is a new frontier of research, exploratory work like the one presented in this dissertation is important to help develop future theory on how mindfulness operates at work. This set of studies integrated "eastern" and "western" conceptualizations of general mindfulness into a single measure that focuses on mindful experience in the workplace and mindful organizational strategy and decision-making. This measure was then applied to early theoretical foundations for how mindfulness operates at work individually and collectively. The Mindfulness at Work measure (MaW) can be a helpful tool for future research of mindfulness at work and how mindfulness impacts relevant outcomes like performance, well-being, communication, etc.

The development of the MaW began with three types of applied mindfulness at work: task-based mindfulness, interactional mindfulness, and organizational mindfulness. Through the measure development process it was shown that task-based and interactional mindfulness are both reflections of individual mindfulness at work, while organizational mindfulness was shown to be both unidimensional and separate from individual mindfulness at work. The development of the MaW also contributed to the empirical understanding of mindfulness at work through illustrating that individual and organizational mindfulness at work are highly related while they seemingly operate separately. This new operationalization of mindfulness, as an applied form of mindfulness, provides a novel conceptual framework for future research that is grounded

in previous mindfulness definitions while providing enough unique value and conceptual uniqueness to warrant its own stream of future application and investigation.

The findings of the current set of studies not only show that individual and organizational mindfulness are related and unique, but also that they are statistically linked. The link between individual and organizational mindfulness at work is not particularly surprising given the overlap present in the constructs. The "eastern" view of individual mindfulness as a skill of maintaining non-judgmental attention and awareness is helpful for stress and well-being as this skill can lead to a state of alert relaxation that has clear benefits to the individual. The "western" view is rational, active, and thoughtful, which can improve creativity, performance, leadership, and organizational strategy. When considered alongside the mindfulness traditions of Hinduism and Buddhism, the experience of the eastern approach is similar to the meditation experience of *shamatha*, or peaceful abiding, while the western approach is more related to the meditative outcome of *prajna*, or discriminating knowledge. Interestingly, the findings of this study suggest that prajna in the form of organizational mindfulness leads to a greater sense of shamatha through a direct and open relationship to the work and coworkers.

Another interesting contribution of these findings is that organizational mindfulness can have an impact on emotional and potentially physical well-being. As the validation results indicate, and because of the impact of organizational mindfulness on individual mindfulness at work, it would seem that organizations that act mindfully according to the principles of "western" mindfulness can create an environment where employees are able to be more mindful at work. Perhaps organizational and individual

mindfulness at work have unique contributions to employee well-being. Additionally, leadership, perceptions of organizational support, and likely many other aspects of the workplace contribute to organizational mindfulness at work. Although findings suggest these factors impact organizational mindfulness, further research is needed to explore what aspects of the workplace contribute to individual mindfulness at work.

The creation of the MaW and the theoretical implications present in the finding of the present studies provide a helpful basis for continuing to research individual and organizational mindfulness at work. Research across a variety of disciplines provides enough empirical support to warrant in-depth explorations of mindfulness at work, its relevant outcomes, and factors that support it. The studies executed for this dissertation should help future scholars contextualize, explore, and understand mindfulness at work.

General Limitations of the Present Studies

The core limitation of this set of studies was the fact that the sample was sourced from Amazon's MTurk. MTurk is a good source of data for the social sciences (Litman et al., 2017), allowing for a sampling of a working adult population instead of sampling from, say, undergraduate populations. However, using this tool to access these worker pools has its downsides. First, it is not possible to explore specific workplaces or group behaviour with MTurk as workers are sourced from various locations and industries. Second, MTurk workers are trained to complete surveys as they have completed many in the past. This "professional" survey experience might result in different responses than a more general population. Future sampling approaches will be needed to support the validity and psychometric properties of the MaW.

Another limitation arises in the exploratory nature of this research. As workplace mindfulness research is in its early stages, this set of studies attempted to integrate various mindfulness conceptualizations and explore the effects of individual and organizational mindfulness on each other. The studies were therefore more theory-building than theory-testing. Now that the potential impact of organizational mindfulness on individual mindfulness at work has been established, future theories of mindfulness at work can be more precise in how they conceptualize the effects of individual and organizational mindfulness on each other. However, the theory-building nature of the studies limited the strength of hypothesis formation and testing outside of initial explorations of individual mindfulness, organizational mindfulness, and contextual factors. Now that the MaW has been developed, more concrete theories and testable hypotheses can be developed and using this measurement tool and the resulting theoretical implications.

A final general limitation of the study is that it was not executed within a single working environment. Any inferences and generalizations drawn from this study are only preliminary, as these relationships and the properties of the MaW will need to be explored within individual workplaces to make strong arguments about the effects of organizational mindfulness on individual mindfulness. Future research around mindfulness at work should focus on collecting data from individual organizations with large sampling populations to fully explore the impact of organizational mindfulness. These types of studies could also integrate group-level collective mindfulness at the departmental or team level. The MaW would need further refinement and development to capture group-level phenomena.

Limitations in the Final MaW

Although research into mindfulness at work is still in its infancy, previous researchers have spent ample time exploring mindfulness in general and therapeutic contexts. Interestingly, the MaW, as well as other related measures, often lead to non-normal data sets. Although manageable through non-parametric testing, non-normal data limits the types of analyses that can be performed. Future measure application should take into account the non-normal nature of this data when planning analyses, or work with a different measurement scale (3 or 5 points) to try to normalize the data. SMEs have suggested that individuals who train in mindfulness could score *lower* on overall mindfulness assessments as these individuals are trained to recognize when they are acting without mindfulness. Descriptive statistics collected from demographic information in the present studies suggest that individuals who have practiced some form of mindfulness in the past (meditation, yoga, etc.) score higher in individual mindfulness at work and organizational mindfulness. Additionally, when grouped according to past experience with mindfulness, data from the present studies suggest *greater* skewness among those with previous mindfulness experience. Clearly normality will continue to be a concern of mindfulness researchers for some time to come.

Another key measurement limitation of the present set of studies was the general measure of mindfulness at work captured by the MaW. This approach was partly due to the limitation of the sample. As MTurk workers all have different workplaces, it would be difficult to track changes in state-based mindfulness as these studies would need to look at employees in the same work environment to make links between mindfulness and its antecedents. Studies within specific work environments could track changes of

mindfulness over time in this type of state-based measurement approach. This approach would allow researchers to explore differences in mindfulness state activation across the day and explore factors that might support or limit mindfulness at work

Future Research

The opportunities for future research in mindfulness at work are vast. Now the MaW has been developed and the relationships between IM and OM have been explored, more research is needed into potential outcomes of mindfulness at work like well-being, performance, flow, creativity. Questions still remain as to how to appropriately and effectively train in mindfulness at work. Additionally, while this study began to explore factors that influence mindfulness at work, more research is need to examine and what other factors to act as antecedents of mindfulness at work. Lastly, the MaW needs further validation using clinical measures like depression and anxiety and should be explored for predictive validity for the outcomes described above and others.

Further validation. Study 2 was the first effort at validating the MaW using a variety of scales. This study intentionally left out more clinically focused measures like anxiety, depression, and burnout in order to keep the tone of the measure non-clinical so as not to shape the responses of participants. Future validation efforts should compare the MaW to clinically focused measures both in outcome of mindfulness and general mindfulness. Given the clear link between mindfulness and well-being, future validation should also consider the MaW in the context of occupational health or clinical constructs like depression, anxiety, burnout, stress perceptions, and engagement. Other future validation efforts should also be helpful to continue assessing the MaW. As the validation study only employed the most commonly used measure for research around

mindfulness at work (MAAS, Brown and Ryan, 2003), future validation efforts should attempt to compare the MaW with other measures of mindfulness (FFMQ, TMS, PHLMS) to see if there are specific measures that converge with it better than others.

Additionally, predictive validity should be explored in specific workplace contexts. Do individual and organizational mindfulness at work differentially predict specific outcomes? Traditionally individual mindfulness has been linked to outcomes like reduced stress and improved well-being, but perhaps organizational mindfulness contributes to these outcomes directly. As organizational mindfulness appears to predict individual mindfulness at work, if organizational mindfulness is linked to health and well-being outcomes, individual mindfulness could be tested as a potential mediator for the possible effects of organizational mindfulness on well-being outcomes. Predictive validation could also be used to explore which of the types of mindfulness, individual or organizational, contributes most directly to performance. Individual mindfulness at work could have a direct effect on individual performance, while perhaps organizational mindfulness at work would lead to stronger measures of organizational performance.

Training in mindfulness at work. Given the eagerness of organizations to apply mindfulness at work, one of the key areas that demands immediate attention in the research is the training of mindfulness at work. As the present studies illustrate, mindfulness at work can be applied to an employee's tasks and interactions with coworkers. Organizations can also behave more mindfully when using the best information with the best people with a willingness to make mistakes and a commitment to bouncing back in the face of challenges. Given these applied forms of mindfulness at work, would a traditional training model based on clinical applications be the most

relevant and helpful? Traditional mindfulness training involves sitting still, noticing sensations in the body, and relating to thoughts. Although this fundamental mindfulness skill might assist with being more mindful in the day-to-day activities of work, training in mindfulness at work should also integrate mindfulness skills in work-based activities. How would one train in mindful task behavior? How would one train in mindful interactions at work? How could you work with local and executive leaders to develop a mindful organization, and would the development of organizational mindfulness have a significant impact on individual mindfulness, as suggested by the findings of Study 3?

Research into the training effectiveness of mindfulness at work should look at the differential impacts of basic mindfulness training, task-based mindfulness training, interactional mindfulness training, and leadership training to support organizational mindfulness. While basic mindfulness training might lead to increases in general mindfulness, which could be captured by a general mindfulness measure, the MaW might more effectively capture the impact of training in work-specific applications given the contextualized nature of the measure and a work-based approach to mindfulness training. Different methods of training could also be explored. Would mindfulness training contextualized to the workplace require face-to-face, in-person training to be effective, or could online, digital training be effective as well?

Different types of mindfulness development and training might also lead to different outcomes. A more general approach to mindfulness might line up with the "calm abiding" experience of shamatha described above, leading to reduced stress and improved well-being, while training in task-based mindfulness could lead to performance improvements in the form of increased attention, less automaticity, creative thinking, and

improved safety behaviours, just to name a few. Similarly, interactional mindfulness training could lead to increases in communication quality, relationship quality, group performance, and possibly helping behaviours. In terms of organizational mindfulness, leaders at local and executive levels of the organization could be trained in the concept of organizational mindfulness and practice how to make strategic organizational decisions based on the principles of this construct. This type of training would encourage leaders to challenge assumptions, consider decisions deeply, and integrate the best possible information and resources into decisions. As is the case for any effective training evaluation, research would need to track organizational members who complete various training modalities over time to determine if there were significant increases in the various forms of mindfulness at work and whether or not these increases had a significant effect on organizationally relevant outcomes.

Group-level collective mindfulness at work. This set of studies focused on collective mindfulness at work as a function of individual perceptions of organizational process in the form of organizational mindfulness. However, collective mindfulness at work could also function at the group, team, or even departmental level. As this set of studies used MTurk for sampling, it was not possible to explore group-level collective mindfulness because MTurk workers all work in different environments. Completing research within a single organization not only addresses the limitations outlined above, but it would also allow for testing of collective mindfulness at the local level. An aggregate of scores at the individual level on the MaW across all members of a group or team could be used to measure group-level collective mindfulness. Additionally, the MaW could be modified to include notions of group and team collective mindfulness

behaviour. Any modified or altered items would need to be tested for psychometric properties and validated using members from specific groups, teams, or departments to fully support any findings around group-level collective mindfulness.

Qualitative research. Although this set of studies was primarily quantitative in nature, there are ample opportunities for strong qualitative research of mindfulness at work. After training in mindfulness, do employees experience more mindfulness at work? Why or why not? Questions like these could provide further ground for exploring antecedents or hindrances to the effective application of mindfulness skills in a work context. Similarly, any state-based approach that tracks mindfulness over time could employ a qualitative assessment of what the employee has been doing in the timeframe between the measurement periods. This approach would allow researchers to link narrative factors in the workplace to increases or decreases in mindfulness at work in an effort to further understand what aspects of the workplace promote or limit the mindful work experience. From the perspective of organizational mindfulness, leaders and decision-makers within organizations can provide narrative assessments of what leads to or limits this type of organizational behaviour. Qualitative data from leaders could provide a model of workplace contexts that support or stymy organizational mindfulness.

Mindful research. Another potential area for future research is the empirical exploration of mindfully executing research itself. Mindfulness researchers should research mindfully, yes? Speaking from experience, often research becomes abstract, overly conceptual, future-focused, and devoid of somatic experience. What would a mindful approach to collecting and analyzing data, assessing and applying theory, and constructing effective reporting of findings look like? Given the rise of intellectual

capital and project-based work, research into mindful research could be used to inform future efforts at training and sustaining workplace mindfulness around work that requires sustained attention of complex, intellectually challenging topics. Often research can be completed with a sense of wanting to get the work done, present the findings, achieve the publication, and increase the meatiness of one's curriculum vitae. But what would a direct, attentive relationship to work that is not driven by future projections or expectations look like? How can researchers, particularly those interested in mindful work, apply the skills of mindfulness to the research process? What would training in mindful research look like, and would the product of mindful research be qualitatively different than research that is completed by a mind that is disembodied, lost in thought, and scatterbrained?

Conclusion

The work contained in this dissertation achieved the goals of integrating various mindfulness conceptualizations, developing a practical measure of mindfulness at work, and completing exploratory research meant to shape theory of collective and individual mindfulness at work. The findings and tools resulting from this research can help shape future studies and serve as a methodological foundation for researching mindfulness at work in the future.

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Appendix A – MaW Initial Item Pool/Proposed Structure

Individual Mindfulness (later changed to task-based mindfulness)
On a scale of 1-7 (1 = never, 7 = almost always), rate how often you experience the following at work.

1. I notice sensations of my physical body while at work.
2. I feel sensations in my body when doing work tasks.
3. I notice when I am distracted by thoughts when working.
4. I notice when I am distracted by feelings when working.
5. I can focus directly on my work task without being distracted by thoughts.
6. I can focus directly on my work without being distracted by feelings.
7. I am aware of what is going on around me while working.
8. When engaging in a work task, I notice what I am thinking.
9. When doing a work activity, I experience my feelings and emotions.
10. I am aware of how I am holding my body when working.
11. I pay attention to how I sit or stand when working.
12. I return to work after losing track because of some distracting thought or feeling.
13. I notice the environment that I am working in.
14. I am able to pay direct attention to my work.
15. I am aware of what is happening around me when working.
16. I feel present when doing work tasks.
17. I am aware of what I am doing when working.
18. When working, I experience my thoughts clearly.
19. When working, I experience my feelings and emotions clearly.
20. I don’t daydream while working.
21. I am not lost in thoughts when doing work.
22. I notice thoughts that I have about my work.
23. I am aware of how I feel about my day-to-day work.
24. When working, I notice what is happening around me.
25. I am able to attend to my work without being distracted.

Social Mindfulness (later changed to interactional mindfulness)

On a scale of 1-7 (1 = never, 7 = almost always), rate how often you experience the following at work.

26. I feel my emotions directly when interacting with others at work.
27. I experience how I am feeling when talking to coworkers.
28. I have direct and honest conversations with coworkers.
29. I am able to be honest with my coworkers about how I feel about my workplace.
30. I am able to be honest with my coworkers about what I think about my workplace.
31. I am able to speak with my coworkers about work issues honesty and directly.
32. My interactions with coworkers are genuine.
33. I feel like I can be myself when interacting with others at work.
34. I listen to others at work without being distracted by thoughts.
35. I am aware of thoughts about my coworkers.
36. When talking to coworkers, I try to understand their needs.
37. When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.
38. I am able to listen to coworkers without being distracted by emotions.
39. I am in touch with how I feel about my coworkers.
40. I am aware of what I think about my coworkers.
41. I am able to listen to coworkers with focused attention.
42. When talking to a coworker, I hear what they are saying clearly and directly.
43. When talking to a coworker, I feel like they understand what I am trying to say.
44. I notice my thoughts when talking with others at work.
45. I experience my feelings when talking with coworkers.
46. I feel heard when talking with my coworkers.
47. I have constructive conversations with others at work.
48. I notice the sensations in my body when interacting with coworkers.
49. I feel present when interacting with coworkers.
50. I am aware of the environment when interacting with coworkers

Organizational Mindfulness

On a scale of 1-7 (1 = never, 7 = almost always), rate how often you experience the following at work.

51. My workplace directly addresses problems as they arise.
52. My workplace uses mistakes as an opportunity to improve.
53. My workplace actively addresses mistakes as they arise.
54. My workplace welcomes a diversity of views and opinions from employees.
55. My workplace appreciates employees' perspectives.
56. My workplace values analysis and understanding.
57. My workplace actively addresses small problems before they become big problems.
58. Members of my workplace are aware of the needs of coworkers.
59. Leaders at my work are in touch with what is happening in the workplace.
60. My workplace plans ahead to make sure employees have what they need when they need it.
61. My workplace values employee training and development.
62. My workplace attends to problems directly.
63. My workplace is able to bounce back from setbacks.
64. My workplace is forward-thinking in its strategy.
65. My workplace does not make decisions automatically.
66. My workplace adapts to meet changing market or customer demands.
67. Members of my workplace come up with new ways to solve problems.
68. My workplace uses the best possible information to solve problems.
69. My workplace changes its approach to problems when the need arises.
70. My workplace acts quickly to solve problems.
71. My workplace uses the best experts to solve problems, no matter their position in the company.
72. Members of my workplace feel connected to their job and want to do well.
73. Members of my workplace treat each other with respect.
74. My workplace responds appropriately to challenges as they arise.
75. My organization uses the right person for the job.

Appendix B: Pilot Study Responses and Feedback

X indicates categorization by one of the participants into one of the three proposed mindfulness at work categories: individual tasks, social/interpersonal, and organizational. Edited items are included in the comments/feedback column. A total of 4 SMEs completed the pilot. Shaded cells are the intended category based on the three factor item development process.

Please categorize the following items into individual, social, or organizational mindfulness. Provide any additional feedback or comments that would be helpful to improve the clarity of the item(s).

	Ind	Org.	Soc.	Comments/Feedback/Action
My workplace does not make decisions reactively without first doing appropriate analysis.		XXXX		Reading level, wordy, double-negative
When doing a work activity, I experience my feelings and emotions.	XXXX			
My workplace appreciates employees' perspectives.		XXXX		
I am able to be honest with my coworkers about what I think about my workplace.			XXXX	
My interactions with coworkers are genuine.			XXXX	
I feel present when doing work tasks.	XXXX			
My workplace welcomes a diversity of views and opinions from employees.		XXXX		
I catch myself when daydreaming and return to work.	XXXX			
I feel like I can be myself when interacting with others at work.			XXXX	

My workplace values employee training and development.		XXXX		
Members of my workplace treat each other with respect.		XX	XXX	Refers to members of workplace, not just workplace. Civility? **Edit: My workplace values respect for others.**
Leaders at my work are in touch with what is happening in the workplace.		XXXX		Vague. Leadership? **Edit: My workplace expects leaders to be in touch with what's happening.**
My workplace is able to bounce back from setbacks.		XXXX		
I am aware of what I am doing when working.	XXXX			What about absorption? Flow?
My workplace realizes that a successful organization comes from employees who are willing to support each other in work tasks.		XX	XXX	My workplace? Managers, CEO, supervisors. Switch from employee support to org support.
I am able to speak with my coworkers about work issues honesty and directly.			XXXX	
I am aware of how I am holding my body when working.	XXXX			.
I have direct and honest conversations with coworkers.			XXXX	
I am in touch with how I feel about my coworkers.	XX		XXXX	Weird wording. bit of ind/soc, possible different factors of task v. social, possible four factors, gets into identity/good worker v. good coworker, thoughts/feelings of interactions instead of actual interactions

I am able to distinguish between how I'm feeling about something and how a coworker might feel about something.	XXX		XXXX	Double-barreled, refer to both, not an exchange per se
My workplace actively addresses mistakes as they arise.		XXXX		
I feel sensations in my body when doing work tasks.	XXXX			
My workplace acts quickly to solve problems.		XXXX		
My workplace uses the best experts to solve problems, no matter their position in the company.		XXXX		
I notice the difference between my own thoughts and the thoughts of a coworker.	XX		XXX	Double-barreled,
I am aware of what I think about my coworkers.	X		XXX	Not interactive, so not social
I feel my emotions directly when interacting with others at work.			XXXX	
I listen to others at work without being distracted by thoughts.			XXXX	
I notice the sensations in my body when interacting with coworkers.	X		XXX	Refer to both ind/soc?
I pay attention to how I sit or stand when working.	XXXX			

I am able to listen to coworkers with focused attention.			XXXX	Change "focused attention" to just "attention"
My workplace values analysis and understanding.		XXXX		Vague. What does this refer to?
I am aware of what is happening around me when working.	XXXX			
I am aware of what is going on around me while working.	XXXX			
I am not lost in thoughts when doing work.	XXXX			Flow. Perhaps something like "notice when lost in thought" and return to work. **Edit: Item deleted due to redundancy.**
I am able to pay direct attention to my work.	XXXX			
My workplace is forward-thinking in its strategy.		XXXX		
I am able to notice when I'm lost in thought and return to work.	XXXX			
I can focus directly on my work task without being distracted by thoughts.	XXXX			
My workplace attends to problems directly.		XXXX		
Members of my workplace are aware of the needs of coworkers.		XXXX	XX	"Members" language here. **Edit: My workplace encourages coworkers to be aware of the needs of others.**
My organization uses the right person for the job.		XXXX		
When talking to a coworker, I feel like they			XXXX	

understand what I am trying to say.				
I am able to return to work after losing track because of some distracting thought or feeling.	XXXX			
I notice the environment that I am working in.	XXXX			
I feel present when interacting with coworkers.			XXXX	
I am able to listen to coworkers without being distracted by emotions.			XXXX	
When talking to coworkers, I try to understand their needs.			XXXX	
My workplace actively addresses small problems before they become big problems.		XXXX		
I feel heard when talking with my coworkers.			XXXX	
When working, I notice what is happening around me.	XXXX			
I notice when I am distracted by thoughts when working.	XXXX			
I notice my thoughts when talking with others at work.			XXXX	
I am aware of thoughts about my coworkers.	XXX		X	No interaction specified.

I am aware of how I feel about my day-to-day work.	XXXX			
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts			XXXX	
I am able to be honest with my coworkers about how I feel about my workplace.			XXXX	
I experience how I am feeling when talking to coworkers.			XXXX	
When talking to a coworker, I hear what they are saying clearly and directly.			XXXX	
I notice when I am distracted by feelings when working	XXXX			
My workplace encourages employees to support each other emotionally.		XXXX	X	
When working, I experience my thoughts clearly.	XXXX			
When working, I experience my feelings and emotions clearly.	XXXX			
My workplace is concerned with employees feeling emotionally connected to their coworkers.		XXXX	XX	
My workplace views the success of all employees as important for the success of the organization.		XXXX		

I can focus directly on my work without being distracted by feelings.	XXXX			
Members of my workplace feel connected to their job and want to do well.		XXXX		"Members" language. Others' mindfulness? Double barreled? (connected and want to do well). **Edit 1: My workplace wants employees to feel connected to the organization. Edit 2: My workplace encourages its employees to strive for their best.**
My workplace responds appropriately to challenges as they arise.		XXXX		
I have constructive conversations with others at work.			XXXX	
When engaging in a work task, I notice what I am thinking.	XXXX			
Members of my workplace come up with new ways to solve problems.		XXXX		
I experience my feelings when talking with coworkers.			XXXX	**Edit: At my workplace employees are encourages to solve problems.**
My workplace uses mistakes as an opportunity to improve.		XXXX		
I notice sensations of my physical body while at work.	XXXX			
My workplace uses the best possible information to solve problems.		XXXX		

I am aware of the environment when interacting with coworkers.			XXXX	
I am able to attend to my work without being distracted.	XXXX			
My workplace changes its approach to problems when the need arises.		XXXX		
My workplace directly addresses work-related problems as they arise.		XXXX		
My workplace plans ahead to make sure employees have what they need when they need it.		XXXX		

Appendix C: Final MaW Item Pool Following Initial Item Development

Measurement scale/instructions:
On a scale of 1-5 (1 = never, 7 = always), rate how often you experience the following at work.

Task mindfulness
Attending directly and non-judgmentally to one's direct experience of physical sensations, thoughts, and emotions while performing the duties of one's work.

1 I notice sensations of my physical body while at work.
2 I feel sensations in my body when doing work tasks.
3 I notice when I am distracted by thoughts when working.
4 I notice when I am distracted by feelings when working
5 I can focus directly on my work task without being distracted by thoughts.
6 I can focus directly on my work without being distracted by feelings.
7 I am aware of what is going on around me while working.
8 When engaging in a work task, I notice what I am thinking.
9 When doing a work activity, I experience my feelings and emotions.
10 I am aware of how I am holding my body when working.
11 I pay attention to how I sit or stand when working.
12 I am able to return to work after losing track because of some distracting thought or feeling.
13 I notice the environment that I am working in.
14 I am able to pay direct attention to my work.
15 I am aware of what is happening around me when working.
16 I feel present when doing work tasks.
17 I am aware of what I am doing when working.
18 When working, I experience my thoughts clearly.
19 When working, I experience my feelings and emotions clearly.
20 I catch myself when daydreaming and return to work.
21 I am not lost in thoughts when doing work.
22 I am able to notice when I'm lost in thought and return to work.
23 I am aware of how I feel about my day-to-day work.
24 When working, I notice what is happening around me.
25 I am able to attend to my work without being distracted.

Social mindfulness

Attending directly and non-judgmentally to one's physical sensations, thoughts, and feelings when interacting with others at work.

1 I feel my emotions directly when interacting with others at work.
2 I experience how I am feeling when talking to coworkers.
3 I have direct and honest conversations with coworkers.
4 I am able to be honest with my coworkers about how I feel about my workplace.
5 I am able to be honest with my coworkers about what I think about my workplace.
6 I am able to speak with my coworkers about work issues honesty and directly.
7 My interactions with coworkers are genuine.
8 I feel like I can be myself when interacting with others at work.
9 I listen to others at work without being distracted by thoughts.
10 I have a clear sense of what I think about my coworkers when I talk to them.
11 When talking to coworkers, I try to understand their needs.
12 When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts.
13 When interacting with coworkers, I am able to listen without being distracted by emotions.
14 I am in touch with how I feel about my coworkers when interacting with them.
15 I am aware of what I think about my coworkers when interacting with them.
16 I am able to listen to coworkers attentively when interacting.
17 When talking to a coworker, I hear what they are saying clearly and directly.
18 When talking to a coworker, I feel like they understand what I am trying to say.
19 I notice my thoughts when talking with others at work.
20 I experience my feelings when talking with coworkers.
21 I feel heard when talking with my coworkers.
22 I have constructive conversations with others at work.
23 I notice the sensations in my body when interacting with coworkers.
24 I feel present when interacting with coworkers.
25 I am aware of the environment when interacting with coworkers.
26 I am able to distinguish between how I'm feeling about something and how a coworker might feel about something when interacting with others at work.
27 I notice the difference between my own thoughts and the thoughts of a coworker when interacting with others at work.

Organizational mindfulness

Qualities of an organization that uses top-down processes to encourage complex thinking and appropriate decision-making based on the best possible information and expertise. Similar to organizational culture.

1 My workplace directly addresses work-related problems as they arise.
2 My workplace uses mistakes as an opportunity to improve.
3 My workplace actively addresses mistakes as they arise.
4 My workplace welcomes a diversity of views and opinions from employees.
5 My workplace appreciates employees' perspectives.
6 My workplace values analysis and understanding when making decisions.
7 My workplace actively addresses small problems before they become big problems.
8 My workplace encourages coworkers to be aware of the needs of others.
9 My workplace expects leaders to be in touch with what is happening.
10 My workplace plans ahead to make sure employees have what they need when they need it.
11 My workplace values employee training and development.
12 My workplace attends to problems directly.
13 My workplace is able to bounce back from setbacks.
14 My workplace is forward-thinking in its strategy.
15 My workplace makes decisions based on appropriate analysis.
16 My workplace adapts to meet changing market or customer demands.
17 My workplace encourages employees to come up with new ways to solve problems.
18 My workplace uses the best possible information to solve problems.
19 My workplace changes its approach to problems when the need arises.
20 My workplace acts quickly to solve problems.
21 My workplace uses the best experts to solve problems, no matter their position in the company.
22 My workplace encourages employees to strive for their best.
23 My workplace values respect for others.
24 My workplace responds appropriately to challenges as they arise.
25 My organization uses the right person for the job.
26 My workplace is concerned with employees feeling emotionally connected to their coworkers.
27 My workplace views the success of all employees as important for the success of the organization.
28 My workplace encourages employees to support each other in work tasks.
29 My workplace encourages employees to support each other emotionally.
30 My workplace wants employees to feel connected to the organization.

Appendix D: Study 1 Survey

Informed Consent for Participation in Psychological Research REB #16-051Thanks you for your interest in participating in our study. Please look over the following information that details the study and your rights as a participant.

Research purpose and procedure. For this study you will complete a short survey consisting of relevant demographic information followed by a variety of psychological measures related to your experience of your thoughts, feelings, and actions while at work. The survey will be used to construct a measure of applied mindfulness at work.

Contact information
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Study Funding provided by: Faculty of Graduate Studies and Research

Potential risks
While there are no foreseeable risks that would result from participation, the consideration of psychological constructs could result in mild discomfort or distress.

Potential benefits
You will have the opportunity to consider your own relationship to mindfulness concepts in a variety of contexts. This consideration could increase your self-awareness and insight into your own psychological profile.

Compensation
In addition to the above benefits, you will be compensated in the amount of $1.50 CAD (adjusted for current USD conversion rate). You must complete the survey to receive compensation, but you can withdraw from the survey at any time. At the end of the

survey you will be given a code to submit to MTurk. Please submit this code after completing the survey to ensure payment for your HIT.

Expected completion time
~15 mins

Eligibility
You must have held at job at some point during the past year where you interacted regularly with coworkers.

Your rights as a participant-
You are under no obligation to participate in this study and can withdraw at any time. If you would like to withdraw, you can exit out of the survey by closing your web browser.-You will be given relevant information on the study based on your decision to participate or withdraw-If you decide to withdraw during the study, the data collected from your participation will be discarded -If you complete the study, all data will be anonymous and the research team will be unable to remove your data from the study at that time

Dissemination of findings
Data collected from participants will be used for analysis and future publications in academic or practitioner journals, as well as other related distribution outlets. You will not be identified in any way in any of the efforts by the researchers in presenting this data to the public. If you would like to find out about the results of the study, feel free to contact any of the researchers listed above.

Data collected and confidentiality
Demographic data and other psychological measures will be collected from participants during the data collection process. Data collected will not contain any identifying information and will only be accessed by the researchers involved with this study. Data will be used for various analyses to inform psychological theory and further research in the field. **This research has been reviewed and approved by the Saint Mary's University Research Ethics Boards. If you have any questions or concerns about ethical matters, you may contact the Chair of the Saint Mary's University Research Ethics Board at ethics@smu.ca or (902) 420-5728.**

○ I consent

Please tell us a bit about yourself.

Have you worked in a job where you interacted with coworkers regularly during the past year?

- ○ Yes
- ○ No

What is your age?

_____

What is your biological sex?

- ○ Female
- ○ Male

What is your race?

- ○ White
- ○ Black
- ○ Native/Indigenous
- ○ Asian
- ○ Native Hawaiian or Other Pacific Islander
- ○ Two or More Races
- ○ Arabic/Middle Eastern

What is your ethnicity?

- ○ Non-Hispanic
- ○ Hispanic

Are you employed full-time or part-time?

- ○ Full-time
- ○ Part-time

What field or industry do you work in?

_____

How many hours per week do you work on average?

_____

Do you currently do any type of mindfulness practice (meditation, yoga, etc.) regularly?

- ○ Yes
- ○ No

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
My workplace encourages employees to support each other in work tasks.							
My workplace is able to bounce back from setbacks.							
I am able to attend to my work without being distracted.							
I listen to others at work without being distracted by thoughts.							
My workplace plans ahead to make sure employees have what they need when they need it.							
I pay attention to how I sit or stand when working.							
My workplace wants employees to feel connected to the organization.							
When doing a work activity, I experience my feelings and emotions.							

My workplace values analysis and understanding when making decisions.	○	○	○	○	○
When talking to coworkers, I am able to hear what they are saying without being distracted by thoughts	○	○	○	○	○
My workplace appreciates employees' perspectives.	○	○	○	○	○
I am aware of what I think about my coworkers when interacting with them.	○	○	○	○	○

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I am able to return to work after losing track because of some distracting thought or feeling.			○	○	○	(	(
My workplace uses the best experts to solve problems, no matter their position in the company.			○	○	○	(	(
My interactions with coworkers are genuine.			○	○	○	(	(
I can focus directly on my work without being distracted by feelings.			○	○	○	(	(
I am in touch with how I feel about my coworkers when interacting with them.			○	○	○	(	(
I feel present when doing work tasks.			○	○	○	(	(
I notice when I am distracted by thoughts when working.			○	○	○	(	(
My workplace acts quickly to solve problems.			○	○	○	(	(

My workplace values employee training and development.	○	○	○	○	○
When talking to a coworker, I hear what they are saying clearly and directly.	○	○	○	○	○
My workplace actively addresses mistakes as they arise.	○	○	○	○	○
I am aware of how I feel about my day-to-day work.	○	○	○	○	○

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I notice when I am distracted by feelings when working			○	○	○	○	
My workplace attends to problems directly.			○	○	○	○	
I have a clear sense of what I think about my coworkers when I talk to them.			○	○	○	○	
When working, I experience my thoughts clearly.			○	○	○	○	
My organization uses the right person for the job.			○	○	○	○	
I am aware of what is happening around me when working.			○	○	○	○	
My workplace encourages coworkers to be aware of the needs of others.			○	○	○	○	
I am able to speak with my coworkers about work issues honesty and directly.			○	○	○	○	
I notice the environment that I am working in.			○	○	○	○	

My workplace is concerned with employees feeling emotionally connected to their coworkers.	○	○	○	○	○
My workplace uses mistakes as an opportunity to improve.	○	○	○	○	○
My workplace encourages employees to support each other emotionally.	○	○	○	○	○

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I notice the difference between my own thoughts and the thoughts of a coworker when interacting with others at work.	(	(	○	○	○	(	(
I am able to pay direct attention to my work.	(	(	○	○	○	(	(
My workplace directly addresses work-related problems as they arise.	(	(	○	○	○	(	(
I am able to be honest with my coworkers about what I think about my workplace.	(	(	○	○	○	(	(
I am aware of what I am doing when working.	(	(	○	○	○	(	(
My workplace makes decisions based on appropriate analysis.	(	(	○	○	○	(	(
I experience how I am feeling when talking to coworkers.	(	(	○	○	○	(	(

When talking to a coworker, I feel like they understand what I am trying to say.	(	(	○	○	○	(	(
My workplace values respect for others.	(	(	○	○	○	(	(
My workplace encourages employees to come up with new ways to solve problems.	(	(	○	○	○	(	(
When working, I notice what is happening around me.	(	(	○	○	○	(	(
I am able to listen to coworkers attentively when interacting.	(	(	○	○	○	(	(
To confirm that you are paying attention, please select never as a response to the right.	(	(	○	○	○	(	(

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I can focus directly on my work task without being distracted by thoughts.	(	(	○	○	○	(	(
My workplace encourages employees to strive for their best.	(	(	○	○	○	(	(
I am able to distinguish between how I'm feeling about something and how a coworker might feel about something when interacting with others at work.	(	(	○	○	○	(	(
I notice my thoughts when talking with others at work.	(	(	○	○	○	(	(
I catch myself when daydreaming and return to work.	(	(	○	○	○	(	(
I am aware of what is going on around me while working.	(	(	○	○	○	(	(

I notice the sensations in my body when interacting with coworkers.	(	(	○	○	○	(	(
When engaging in a work task, I notice what I am thinking.	(	(	○	○	○	(	(
My workplace adapts to meet changing market or customer demands.	(	(	○	○	○	(	(
My workplace actively addresses small problems before they become big problems.	(	(	○	○	○	(	(
My workplace responds appropriately to challenges as they arise.	(	(	○	○	○	(	(
I have direct and honest conversations with coworkers.	(	(	○	○	○	(	(

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I feel present when interacting with coworkers.	(	(	○	○	○	(	(
I feel sensations in my body when doing work tasks.	(	(	○	○	○	(	(
My workplace changes its approach to problems when the need arises.	(	(	○	○	○	(	(
When talking to coworkers, I try to understand their needs.	(	(	○	○	○	(	(
I am able to be honest with my coworkers about how I feel about my workplace.	(	(	○	○	○	(	(
I am aware of how I am holding my body when working.	(	(	○	○	○	(	(

When interacting with coworkers, I am able to listen without being distracted by emotions.	○	○	○	○	○	○	○
My workplace uses the best possible information to solve problems.	○	○	○	○	○	○	○
I am aware of the environment when interacting with coworkers.	○	○	○	○	○	○	○
My workplace expects leaders to be in touch with what is happening.	○	○	○	○	○	○	○
I experience my feelings when talking with coworkers.	○	○	○	○	○	○	○
I feel heard when talking with my coworkers.	○	○	○	○	○	○	○

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I feel like I can be myself when interacting with others at work.	(	(	○	○	○	(	(
I am able to notice when I'm lost in thought and return to work.	(	(	○	○	○	(	(
My workplace welcomes a diversity of views and opinions from employees.	(	(	○	○	○	(	(
I am not lost in thoughts when doing work.	(	(	○	○	○	(	(
When working, I experience my feelings and emotions clearly.	(	(	○	○	○	(	(
My workplace views the success of all employees as important for the success of the organization.	(	(	○	○	○	(	(
I have constructive conversations with others at work.	(	(	○	○	○	(	(

I notice sensations of my physical body while at work.	(	(	○	○	○	(	(
My workplace is forward-thinking in its strategy.	(	(	○	○	○	(	(
I feel my emotions directly when interacting with others at work.	(	(	○	○	○	(	(

Thanks for your help with this study! Please submit the following code to MTurk to receive payment for your work:

TYVMMTRX

Appendix E: Final Mindfulness at Work Measure

The Mindfulness at Work (MaW) Measure

On a scale of 1-7, rate how often you experience the following at work.
1 – never
2 – rarely
3 – occasionally
4 – sometimes
5 – frequently
6 – usually
7 – always

Individual Mindfulness
I return to work after losing track because of some distracting thought or feeling.
I pay direct attention to my work.
I am aware of what is happening around me when working.
When talking to coworkers, I try to understand their needs.
When talking to coworkers, I hear what they are saying without being distracted by thoughts.
I feel present when interacting with coworkers.

Organizational mindfulness
My workplace welcomes a diversity of views and opinions from employees.
My workplace actively addresses small problems before they become big problems.
My workplace plans ahead to make sure employees have what they need when they need it.
My workplace attends to problems directly.
My workplace uses the right person for the job.

Scoring: Take the mean score across all 6 individual mindfulness items, then take the mean score across all 5 organizational mindfulness items. The measure is bi-dimensional, but subscales can be used individually to address specific research questions.

Appendix F: Study 3 Survey

Informed Consent for Participation in Psychological Research
REB #16-051
Thanks you for your interest in participating in our study. Please look over the following information that details the study and your rights as a participant.

Research purpose and procedure
For this study you will complete a short survey consisting of relevant demographic information followed by a variety of psychological measures related to your experience of your thoughts, feelings, and actions while at work. The survey will be used to construct a measure of applied mindfulness at work. This is the first of three surveys which will be completed over a 6 week period. Participation in the second and third study is required for your survey to be used in this study.

Contact information
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Lori Francis
Faculty Sponsor
Lori.Francis@smu.ca

Potential risks
While there are no foreseeable risks that would result from participation, the consideration of psychological constructs could result in mild discomfort or distress.

Potential benefits
You will have the opportunity to consider your own relationship to mindfulness concepts in a variety of contexts. This consideration could increase your self-awareness and insight into your own psychological profile.

Compensation
In addition to the above benefits, you will be compensated in the amount of $0.50 CAD (adjusted for current USD conversion rate). You must complete the survey to receive compensation, but you can withdraw from the survey at any time. At the end of the survey you will be given a code to submit to MTurk. Please submit this code after completing the survey to ensure payment for your HIT. You will receive a follow up to this survey in two weeks' time asking for you to complete a second survey. After

completing this survey, you will receive another email two weeks later for the third and final survey. Compensation will increase each time.

Expected completion time~5 mins

Eligibility You must have held at job at some point during the past year where you interacted regularly with coworkers and a supervisor/boss.
You must be willing to complete a second and third survey in two and four weeks following the completion of this survey.

Your rights as a participant-You are under no obligation to participate in this study and can withdraw at any time. If you would like to withdraw, you can exit out of the survey by closing your web browser.-You will be given relevant information on the study based on your decision to participate or withdraw-If you decide to withdraw during the study, the data collected from your participation will be discarded -If you complete the study, all data will be anonymous and the research team will be unable to remove your data from the study at that time

Dissemination of findings
Data collected from participants will be used for analysis and future publications in academic or practitioner journals, as well as other related distribution outlets. You will not be identified in any way in any of the efforts by the researchers in presenting this data to the public. If you would like to find out about the results of the study, feel free to contact any of the researchers listed above.

Data collected and confidentiality
Demographic data and other psychological measures will be collected from participants during the data collection process. Data collected will not contain any identifying information and will only be accessed by the researchers involved with this study. Data will be used for various analyses to inform psychological theory and further research in the field.

**This research has been reviewed and approved by the Saint Mary's University Research Ethics Boards. If you have any questions or concerns about ethical matters, you may contact the Chair of the Saint Mary's University Research Ethics Board at ethics@smu.ca or (902) 420-
5728.**

○ I consent

Please tell us a bit about yourself.

Have you worked at least part-time in a job where you interacted with coworkers and a boss/supervisor regularly during the past year?

- ○ Yes
- ○ No

What is your age?

_____

What is your biological sex?

- ○ Female
- ○ Male

What is your race?

- ○ White
- ○ Black
- ○ Native/Indigenous
- ○ Asian
- ○ Native Hawaiian or Other Pacific Islander
- ○ Two or More Races
- ○ Arabic/Middle Eastern

What is your ethnicity?

- ○ Non-Hispanic
- ○ Hispanic

Are you employed full-time or part-time?

- ○ Full-time
- ○ Part-time

What field or industry do you work in?

_____

How many hours per week do you work on average?

_____

Do you currently do any type of mindfulness practice (meditation, yoga, etc.) regularly?

- ○ Yes
- ○ No

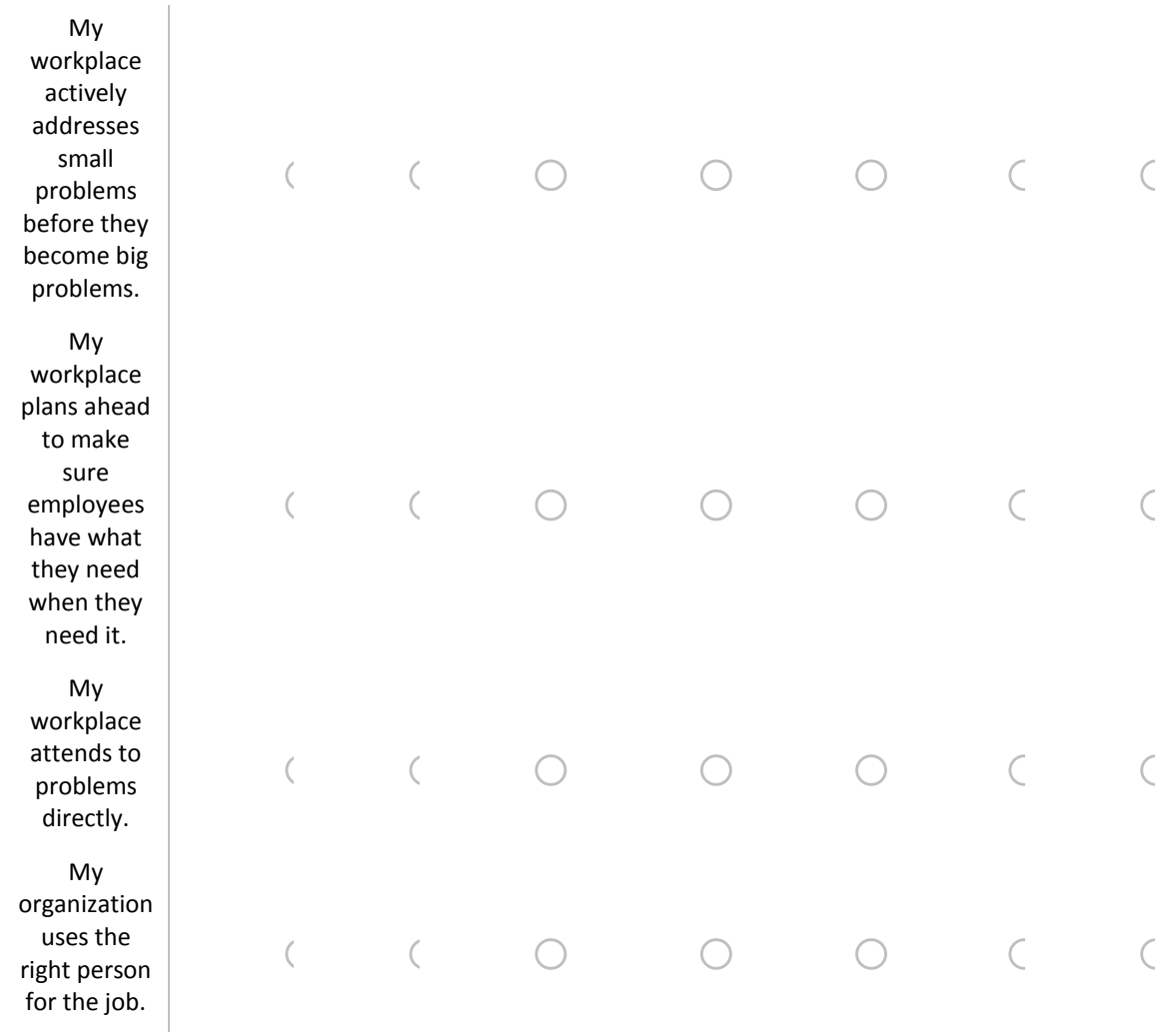
Approximately how many years have you been doing some form of mindfulness practice?

_____

How much would you say your mindfulness practice carries over into your daily life?

- ○ A great deal
- ○ A lot
- ○ A moderate amount
- ○ A little
- ○ None at all

	1 - Never	2- Rarely	3- Occasionally	4- Sometimes	5- Frequently	6- Usually	7- Always
I am able to return to work after losing track because of some distracting thought or feeling.	(	(	○	○	○	(	(
I am able to pay direct attention to my work.	(	(	○	○	○	(	(
I am aware of what is happening around me when working.	(	(	○	○	○	(	(
When talking to coworkers, I try to understand their needs.	(	(	○	○	○	(	(
I am able to listen to coworkers attentively when interacting.	(	(	○	○	○	(	(
I feel present when interacting with coworkers.	(	(	○	○	○	(	(
My workplace welcomes a diversity of views and opinions from employees.	(	(	○	○	○	(	(



Items for ethical leadership (ELS, Brown et al., 2005) and perceived organizational support (SPOS-8, Eisenberger et al., 1986) have not been included to honor proprietary ownership and copyright law.