

DO YOU MIND THE WAY I MIND?
MINDFULNESS CONTAGION IN LEADER-MEMBER EXCHANGE RELATIONSHIPS

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ABSTRACT

Mindfulness has captured the attention of organizational scholars and practitioners alike, in large part due to the positive effects it can have for employees. Recently, researchers have begun to look beyond the personal benefits of mindfulness at work, investigating its interpersonal consequences in leader-follower relationships. While this line of research has generated promising findings suggesting the benefits of leader mindfulness for followers, it is not well understood how mindful leaders exert this positive influence. Using dyadic data collected from supervisors and subordinates working in a Canadian public sector organization, this study examines whether mindful leaders can improve follower well-being and performance by nurturing high-quality leader-member exchange relationships and promoting follower mindfulness. The results indicate that both the size and direction of the effects of leader mindfulness on follower mindfulness and well-being are contingent upon the quality of LMX relationships nurtured by group members and their leaders.

Keywords: leader mindfulness; dispositional mindfulness; leader-member exchange; subjective well-being; in-role performance.

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INTRODUCTION

Background

The topic of mindfulness has received substantial attention in recent decades, with a large body of research demonstrating the benefits of mindfulness for mental and physical health outcomes (for a review, see Creswell, 2017). Mindfulness-based interventions have expanded into many workplace settings, as illustrated by the adoption of mindfulness-based workforce training programs among Fortune 500 companies such as Google, Intel, and General Mills (Hafenbrack, 2017). So far, these initiatives have been supported by organizational research showing considerable evidence for the beneficial effects of mindfulness on key workplace outcomes, most notably employee performance and well-being (Good et al., 2016).

Whereas organizational research on mindfulness offers strong evidence for the beneficial connection between mindfulness and important employee outcomes, there remains a need for research exploring a wider range of outcomes that are associated with employee mindfulness. Moreover, there is a concomitant need to identify a more complete range of possible mechanisms that can facilitate mindfulness development in the workplace. In particular, one area of organizational research that has not been studied extensively in the context of mindfulness is interpersonal relationships. Little is known about how an employee's mindfulness can influence important outcomes for his or her colleagues. Furthermore, it is not well-understood whether interpersonal relationships in the workplace can play a role in facilitating or hindering employee mindfulness. Workplace relationships play an integral role in both organizational science and practice, impacting many core areas such as teamwork, communication, coordination, and conflict (Ferris et al., 2009). In terms of specific relationships, leader-follower relationships are among the most influential we have at work (Dienesch & Liden, 1986). Prominent theories in organizational

behavior and social psychology suggest that leaders can play an inordinate role in shaping the behaviors, attitudes, identities, and emotional states of followers (e.g., Bandura, 1977; Turner & Tajfel, 1986; Hatfield, 1993; Ibarra, 1999). Accordingly, leader-follower relationships may be an important aspect of work-life for understanding the determinants and outcomes of mindfulness in organizations.

In recent years, researchers have begun to investigate the interpersonal correlates of mindfulness in the context of leader-follower relationships, pointing to a possible connection between leader mindfulness and positive outcomes for direct followers (Reb et al., 2014). Some of these investigations have drawn upon well-known leadership concepts such as transformational leadership (Carleton et al., 2018; Pinck & Sonnentag, 2018) and procedural justice enactment (Schuh et al., 2019) to build an understanding of the positive effects of leader mindfulness for followers. While these studies find support for a connection between leader mindfulness and positive expressions of leadership, this line of research has not thoroughly explored the possibility that mindful leaders can exert a positive influence by fostering mindfulness development among their followers.

In her review of the status of research on mindfulness development in organizations, Ute Hülshager (2015) called for research on a wider range of mindfulness antecedents. She proposed that there may be a range of viable mechanisms that organizations can leverage to promote mindfulness and that these could function at various levels of analysis. Drilling down on this proposal, Hülshager poses the question: “Does leader mindfulness spill over to team members such that, for example, more visionary and mindful leaders have more mindful followers?” (p. 678). Considering the influential role played by leaders in their relationships with followers, the possibility that leader behaviors and characteristics (e.g., mindfulness) exert a top-down influence

on the mindfulness of followers naturally presents itself as an important line of inquiry within a multi-level, holistic approach to research on employee mindfulness development. As Hülsheger concludes, “Addressing these questions would signalize that organizations can do more than offering mindfulness trainings in that they can contribute to promoting mindfulness by implementing corresponding organizational- and team-related policies and practices.” (p. 678). Hence, the question of whether (or not) leaders can facilitate follower mindfulness warrants further investigation.

To lay the groundwork for such an investigation, this study will review the relevant concepts and theories that provide a framework for understanding the possible role of leaders in fostering follower mindfulness. It contributes to the burgeoning line of organizational scholarship in mindfulness and leadership by examining a possible outcome of leader mindfulness that has received little attention in the literature: follower mindfulness. This thesis also contributes to research on the antecedents of employee mindfulness by proposing that interpersonal relationships play an important role in facilitating mindfulness development in the workplace. In addition to these contributions to scholarship, this research makes an important contribution to management practice. Given that mindfulness has been shown to have positive impacts on employee performance and well-being (Good et al., 2016), organizations should be acutely concerned with understanding the full range of effective mechanisms for cultivating mindfulness among their employees. This study proposes that organizations can leverage leaders as a possible mechanism for promoting employee mindfulness, which in turn can improve employee performance and well-being. Furthermore, it contributes to a more complete understanding of the benefits of leader mindfulness, which may inform organizational efforts to promote mindfulness as a positive attribute of leaders.

Thesis Outline

This study will begin by introducing the concept of mindfulness. It will then review the organizational research on mindfulness in terms of its implications for employee performance and well-being. Moving beyond these general implications, the study will then focus more directly on the consequences of leader mindfulness for followers. The antecedents of mindfulness in the workplace will then be reviewed. Building on this research, the study will draw upon theories in organizational behavior and psychology to examine the following research questions: (a) does leader mindfulness influence follower in-role performance and subjective well-being through higher levels of follower mindfulness; and (b) does this influence depend on the quality of the leader-follower relationship? Based on this framework, four hypotheses will be offered regarding the role that mindful leaders are proposed to play in facilitating follower performance and well-being through follower mindfulness, and the conditions under which they may do so. The hypotheses are tested empirically using data collected from a matched sample of supervisors and subordinates. The results of the study are then discussed with a focus on their theoretical and practical implications.

LITERATURE REVIEW

The Concept of Mindfulness

The emergence of mindfulness in western scholarship can be traced back to a practice that is at the foundation of Buddhist teachings—mindfulness meditation. Mindfulness practice typically involves directing attention to the present by focusing on one’s breathing or scanning the body for physical sensations and can also take form in a variety of exercises that promote greater awareness and attention in everyday life (Creswell, 2017). In recent decades, mindfulness practice has achieved increased popularity in many countries throughout the world, beyond its Eastern origins (Mitchell, 2008). As mindfulness practice has grown in popularity, the topic has attracted substantial attention from Western scholars across various disciplines, such as clinical psychology, neuroscience, and medicine. Furthermore, as group-based and internet-based mindfulness programs are more frequently introduced in the workplace, the topic has attracted the attention of researchers in the organizational sciences (Good et al., 2016). While one area of organizational research on mindfulness has focused on the efficacy of employee mindfulness interventions, another line of inquiry has examined mindfulness as a measurable state of consciousness or as a dispositional characteristic of employees (Jamieson & Tuckey, 2017). This body of research has demonstrated that, as an underlying psychological process, higher levels of mindfulness can improve multiple aspects of employee functioning and may be facilitated or hindered by a variety of workplace experiences and conditions (Good et al., 2016; Reb et al., 2015; Lawrie et al., 2018).

Although conceptually distinct, mindfulness as a practice and mindfulness as a quality of consciousness are closely connected. The practice of mindfulness meditation is fundamentally geared toward improving one’s predisposition to be mindful in everyday life. Improvements in one’s tendency toward mindfulness are achieved by eliciting heightened and more frequent states

of mindfulness during meditative practice (Kiken et al., 2015). What does it mean to experience mindfulness as a form of consciousness? From the state- and trait-based perspective, mindfulness is defined as a quality of human consciousness that is characterized by “a receptive attention to and awareness of present events and experience” (Brown & Ryan, 2003, p. 212). Central to many traditional and contemporary conceptualizations of mindfulness is the delineation of attention and awareness as the two core components of mindfulness (Quaglia et al., 2015). Awareness refers to the conscious apprehension of physical stimuli and thoughts. Attention refers to the process of noticing or being engaged by an immediate stimulus. Together, these components are considered fundamental to mindfulness in conscious experience and activity (Brown et al., 2007). Apart from these features, some have argued that additional dimensions of mindfulness should be included in its definition. For example, the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) conceptualizes mindfulness as encompassing five distinct components: observing (perceiving internal/external stimuli); describing (articulating/labeling experience); acting with awareness (not running on “automatic pilot”); nonreactivity (detachment from thoughts/emotions); and nonjudging (accepting attitude toward experience). Other measures are even more expansive, such as the 8-dimensional Comprehensive Inventory of Mindfulness Experience (CHIME; Bergomi et al., 2013). Although mindfulness in its most expansive conceptualization can be understood as an amalgamation of many dispositional subdimensions, the main focus of this research will be on the commonly distilled definition of mindfulness as the coupling of attention and awareness, which is understood and measured as an underlying global characteristic of individuals.

The integration of attention and awareness is considered a key distinguishing feature of mindfulness (Dreyfus, 2011). In other words, mindfulness entails that attention toward an activity or experience must be coupled with a lucid awareness that serves to monitor each experience in its

wider context (Creswell, 2017). The integration of attention with meta-awareness represents an important theoretical divergence between mindfulness and other closely related forms of consciousness. In particular, the concept of attentional control overlaps with mindfulness, since both entail stable and continued attention toward a focal experience or activity (Quaglia et al., 2015). However, mindfulness distinguishes itself from attentional control in the coupling of attention with a broader awareness of ongoing experience. While attentional control may enable one to sustain concentrated attention on an activity for extended periods, this attentiveness must be monitored through an awareness of one's surroundings and current state of mind for consciousness to be considered mindful (Goodman et al., 2015).

The conceptualization of mindfulness as enhanced attention and awareness implies that mindfulness, at its core, represents a state of consciousness. When experiencing mindfulness states, individuals are highly attuned to present reality through enhanced attention to and awareness of ongoing events. In less mindful states, consciousness may be blunted by distracting thoughts and anxieties that draw one's attention away from the present-moment experience (Brown & Ryan, 2003).

While many individuals can experience mindfulness states from time to time, there is variation between individuals in terms of the strength and frequency with which these states occur (Glomb et al., 2011). An individual's tendency toward states of mindfulness is referred to as "dispositional mindfulness" (Brown & Cordon, 2009). Dispositional mindfulness has been shown to have important implications for human functioning. Individuals who tend toward mindfulness can benefit from heightened and more frequent mindfulness states in their daily experiences (Brown et al., 2007). Moreover, as will be discussed in this paper, a substantial body of research has demonstrated the importance of dispositional mindfulness for employee functioning (Good et

al., 2016). In particular, research on mindfulness in organizations has explored the relationship between mindfulness and two important employee outcomes: performance and well-being. The following section will review this research to highlight the implications of mindfulness for employees and organizations. A summary of research findings can be found in Table 1.

INSERT TABLE 1 HERE

Mindfulness and Employee Performance

Several studies have demonstrated substantial support for the positive effects that dispositional mindfulness can have on employee performance (Good et al., 2016). This area of research has investigated the relationship between employee mindfulness and performance across a variety of performance measures and in various organizational contexts. For example, Dane and Brummel (2014) found a positive relationship between restaurant servers' self-reported ratings of dispositional mindfulness and supervisor-rated job performance. Similar findings were reported by Beach et al. (2013), who demonstrated a positive relationship between the mindfulness of health care workers and patient satisfaction ratings. Examining this connection in an entirely different context, Zhang et al. (2013) found a positive association between dispositional mindfulness of nuclear power plant employees and safety performance. Together, these findings point to the important role played by mindfulness in promoting employee performance and demonstrate that the relationship can occur across different workplace contexts and using various indicators of in-role performance.

Researchers have also examined the relationship between employee mindfulness and extra-role performance. In a study of Singaporean employees working across various industries and job levels, Reb et al. (2015) found a positive association between dispositional mindfulness and

organizational citizenship behaviors and a negative relationship with workplace deviance. Examining altogether different categories of extra-role performance, Krishnakumar and Robinson (2015) found an inverse relationship between dispositional mindfulness and hostile tendencies as well as counterproductive work behaviors, as reported by college students working in part-time roles. In addition to findings supporting the positive effects of mindfulness for in-role performance, these studies indicate that mindful employees are more likely to go above and beyond the formal requirements of the job in ways that contribute positively to the overall functioning of their organizations.

While survey research has demonstrated a positive connection between dispositional mindfulness and employee performance, the combined results of controlled experiments involving mindfulness training interventions are ambivalent. In a meta-analysis of randomized controlled trials, Bartlett et al. (2019) reported inconclusive results regarding the effects of training interventions on employee performance due to insufficient data. The authors explain that more suitable techniques for assessing performance are needed to support the connection between mindfulness and performance in the context of workplace interventions. Thus, whether mindfulness training programs can be considered an effective tool for triggering improvements in employee performance remains an open question.

In sum, multiple studies have demonstrated support for the positive influence of dispositional mindfulness on employee performance. Moreover, these findings have been demonstrated across diverse workplace contexts using various measures of in-role and extra-role performance. More experimental evidence is needed to confirm the efficacy of workplace mindfulness interventions for these outcomes. However, evidence for the beneficial role played by

dispositional mindfulness in improving performance highlights the importance of cultivating mindfulness in the workplace for both organizations and employees.

Mindfulness and Employee Well-being

Employee well-being encompasses a broad range of concepts related to the psychological experience and functioning of workers (Sonnetag, 2015) and is a crucial area of concern in management practice and scholarship due to its implications for important outcomes including employee productivity, quality of decision-making, and absenteeism (Danna & Griffin, 1999). Organizational research on mindfulness has demonstrated the beneficial effects of mindfulness and mindfulness training on various dimensions of employee well-being. In a meta-analysis of 23 separate studies, Bartlett et al. (2019) found overall support for the positive effects of mindfulness training on multiple dimensions of employee well-being, including lower levels of stress, anxiety, and psychological distress. These findings offer strong support for the effectiveness of mindfulness training for promoting improvements in important indicators of employee well-being.

In addition to findings from Bartlett et al.'s (2019) meta-analysis on a subset of employee well-being indicators, individual studies have also found a connection between mindfulness and other dimensions of well-being. For example, Slutsky et al. (2019) demonstrated improvements in attentional focus, work-life conflict, and job satisfaction following participation in a six-week mindfulness training program compared to a control group. Comparable findings were reported by Malinowski and Lim (2015), who demonstrated a positive association between dispositional mindfulness and both mental well-being and job engagement. Examining the effects of dispositional mindfulness and mindfulness training, Hülshager et al. (2013) found that both were associated with improvements in employee job satisfaction and emotional exhaustion. Together,

these studies suggest that dispositional mindfulness and mindfulness training can have a positive influence on a wide range of dimensions of employee well-being.

Overall, organizational research provides strong combined evidence for the salutary effects of mindfulness concerning key indicators of well-being, including stress, anxiety, and psychological distress. Findings of individual studies also suggest a relationship between mindfulness and a range of other important aspects of well-being, such as job engagement and emotional exhaustion. Given the importance of employee well-being and the evidence suggesting its close relation to mindfulness, the question of how mindfulness can be cultivated at work represents an important area of research that is of interest to both employees and organizations.

Mindfulness and Leadership

While a large body of research on mindfulness in organizations has focused on intra-individual outcomes such as employee well-being and performance, comparatively less research has explored the interpersonal consequences of mindfulness in the workplace (Reb et al., 2019). Outside of workplace settings, clinical research has provided strong evidence for the connection between mindfulness and positive relationship outcomes. For example, participation in a mindfulness training program (Carson et al., 2004) and dispositional mindfulness (Quaglia et al., 2015) have both been associated with improved relationship quality among intimate partners. Recently, researchers have begun to investigate the interpersonal correlates of mindfulness in workplace relationships. Although it has not been studied extensively, leadership is one important area of management research that is inherently relational and has begun to receive attention from mindfulness researchers (Good et al., 2016). This burgeoning line of research has demonstrated support for the connection between leader mindfulness and positive outcomes for subordinates.

Followers in dyadic relationships with mindful leaders have been found to perform better (Schuh et al., 2019) and demonstrate more organizational citizenship behaviors (Reb et al., 2014; Reb et al., 2019). Leader mindfulness has also been positively associated with various dimensions of follower well-being, including positive affect, job satisfaction, and work-life balance, and negatively associated with emotional exhaustion (Reb et al., 2014; Pinck & Sonnentag, 2018). In addition to demonstrating the benefits of leader mindfulness for a range of follower outcomes, researchers have drawn upon various mechanisms to explain these relationships. For example, Pinck and Sonnentag (2018) found that self-rated transformational leadership style mediated the relationship between leader mindfulness and follower well-being. Carleton et al. (2018) reported similar findings with respect to leader mindfulness and transformational leadership (as rated by followers) and found that the relationship is mediated by leader positive affect and self-efficacy beliefs. Other mechanisms that have been found to explain the connection between leader mindfulness and follower outcomes include higher levels of procedural justice enactment (Schuh et al., 2019), psychological need satisfaction (Reb et al., 2014), and leader-member exchange quality (Reb et al., 2019).

Overall, in addition to research showing the benefits of employee mindfulness for intra-individual outcomes, research on leader mindfulness suggests that there can also be positive interpersonal implications of mindfulness when demonstrated by leaders. Studies on leader mindfulness have suggested that beneficial follower outcomes can be explained by well-known positive styles and behaviors of leaders. However, this line of research has not considered the possibility that mindful leaders might also facilitate positive outcomes by fostering mindfulness development among their followers. The current research addresses this gap by proposing leader mindfulness as an antecedent of follower mindfulness. The next section will outline the findings

of research on the antecedents of mindfulness in the workplace, leading to a theoretical discussion regarding the role of leaders in facilitating mindfulness among followers.

Antecedents of Mindfulness

As outlined above, some studies have explored the consequences of mindfulness in terms of leader and follower outcomes. On the other hand, a search of published research on leadership and mindfulness (Reb et al., 2014; Carleton et al. 2018; Pinck & Sonnentag, 2018; Reb et al., 2019; Schuh et al., 2019) indicates that less attention has been directed to the possible antecedents of mindfulness in the context of leader-follower relationships. This apparent gap in the leadership literature on mindfulness stands in contrast to the growing body of organizational research that has investigated other experiences in the workplace as possible antecedents of employee mindfulness. In particular, a large number of studies (e.g., Manotas et al., 2014; van Berkel et al., 2014; Grégoire & Lachance, 2015) have explored the influence of workplace mindfulness training interventions on the development of employee mindfulness. Recent studies have also explored the role played by key job and workplace characteristics.

In a meta-analysis combining the results of 12 randomized controlled trials, Bartlett et al. (2019) report an overall positive pooled effect of mindfulness training programs on employee mindfulness, as measured by four commonly used instruments. Moreover, the positive effects were found to hold across a variety of mindfulness training protocols and were strongest when measuring mindfulness using the unidimensional Mindful Attention and Awareness Scale (MAAS). These combined findings offer strong support for the efficacy of structured and extended mindfulness training programs in terms of their ability to influence dispositional mindfulness development among employees.

In addition to experimental studies on mindfulness-based interventions, it has also been demonstrated that psychological demands in the workplace are negatively related to daily employee mindfulness, and that job control is positively associated with mindfulness, especially in the presence of a high psychosocial safety climate (Lawrie et al., 2018). Reb et al. (2015) demonstrated the role that the organizational environment can play in fostering employee mindfulness, reporting a positive association between organizational support and mindfulness, and a negative relationship between organizational constraints and mindfulness. More recently, Reina and Kudesia (2020) proposed a theoretical framework in which mindfulness is elicited in the workplace via a combination of individual and situational factors that contribute to on-task attentional pull and off-task demands. In a series of empirical studies, they find that mental fatigue is associated with lower mindfulness and that mindfulness is heightened when the individual is motivated to allocate cognitive resources toward self-regulation. They also show that mindfulness increases in situations where attention is pulled toward tasks (e.g., when tasks balance skill and challenge), but decreases when attention is pushed away from tasks (e.g., completing “busy work” or distractions from technology).

These findings point to the important role played by key experiences in the workplace related to training, motivation, job design, and perceptions of organizational characteristics, offering some insight into how organizations can cultivate mindfulness among employees. However, within the growing body of research on workplace mindfulness antecedents, the question of whether influential workplace relationships can play a role in the development of employee mindfulness has not been thoroughly addressed. While employees may develop many important connections at work, relationships with immediate supervisors are likely to be among the most influential due to the hierarchical structure of most workplaces (Dienesch & Liden, 1986).

Thus, the issue of whether leaders can facilitate or hinder mindfulness among followers, and the conditions under which they may do so, is an important unanswered question. The following section will review the relevant concepts and theories for understanding the role of leaders in facilitating follower mindfulness and will develop four specific hypotheses that will be tested regarding the nature of this relationship.

THEORETICAL FRAMEWORK

The Relationship Between Leader and Follower Mindfulness

According to social learning theory (Bandura, 1977; Bandura, 1986), individuals develop new patterns of behavior either through their direct experiences via reward and punishment, or by observing and modeling the behavior of influential role models. In the first mode of learning, people acquire behavioral patterns by evaluating the success of their strategies when confronted with new situations. Over time this process of exploration enables individuals to retain a repertoire of successful behaviors, while ineffectual behaviors are discarded. The second and more efficient form of learning involves picking up behaviors by observing role models closely, developing an internal representation of their behavior, reproducing the behavior, and then evaluating the success of the matching attempt. Accordingly, an individual will develop new patterns of behavior when exposed to a model who demonstrates the behavior repeatedly, prompts the individual to reproduce the behavior, and strongly rewards the behavior when it occurs (Bandura, 1977).

The learning processes outlined by social learning theory offer an important perspective on how leaders might influence follower mindfulness within organizational settings. According to the theory, individuals who occupy a high position within the “prestige hierarchy” and have control over reward and punishment are more likely to be an effective source of behavioral modeling (Bandura, 1986, p. 207). Consequently, leaders are likely to serve as a key reference for modeling among their subordinates by virtue of their status, level of achievement, and organizationally sanctioned power over reward and punishment. This theoretical argument is not uncommon in the leadership literature. For example, in ethical leadership research, social learning is frequently cited as a key theoretical mechanism for understanding how ethical leaders influence the ethical standards and normative behaviors of their subordinates (Den Hartog, 2015).

As previously discussed, research on leader mindfulness has typically investigated whether mindful leaders have a positive impact on the well-being and performance of their subordinates. However, social learning theory offers a basis for how mindful leaders may be viewed as role models and objects of imitation for learned mindfulness among followers. Given their high status and control over reward and punishment, mindful leaders are likely to both model and set expectations for mindfulness in the workplace in terms of its behavioral expression. For example, high levels of dispositional mindfulness have been associated with more positive tenor and reduced emotional reactions during conflict, more active listening, less evaluative judgment of others when communicating, and greater expressions of empathy and compassion (Good et al., 2016). When exhibited by leaders, these possible behavioral manifestations of mindfulness may serve as demonstrations of appropriate styles of workplace communication and teamwork, which can be reinforced by mindful leaders through the organizationally sanctioned use of reward and punishment.

Aside from prestige and power, the social identity theory of leadership (Hogg, 2001) offers an alternative basis for why leaders may be viewed as model group members who influence the behavior and identities of followers. The original more general social identity theory (Turner & Tajfel, 1986) describes three cognitive processes that individuals follow when determining their group membership: social categorization, social identification, and social comparison. The cognitive process of social identification leads group members to develop an internal representation of the group's normative properties, which facilitates their efforts to embody these collective attributes. Hogg (2001) extended this theory by applying it to an analysis of leader influence in groups. The resulting "social identity theory of leadership" posited that leaders may be viewed as highly prototypical group members and are thus important sources of information

regarding group social norms. Therefore, prototypical leaders will be disproportionately influential in determining the identity and behaviors of other group members (Hogg et al., 2012).

In this regard, mindful leaders may foster mindfulness under their inordinate influence in shaping the group's collective identity. Due to the cognitive processes involved in social identification, followers may look to mindful leaders as prototypes for appropriate behaviors and identities for workgroup members. Followers who are low in mindfulness may need to redefine themselves to embody the normative properties of the group, as largely demonstrated by the leader. Thus, the social identity theory of leadership offers a possible explanation for how leader mindfulness may be emulated by followers because of the social pressures associated with workgroup membership.

Organizational research on professional identity development may also offer some insight into how leaders can facilitate mindfulness as part of workplace socialization. Based on her qualitative research on professional adaptation among junior professionals, Herminia Ibarra (1999) describes the process of experimentation undertaken by employees when being socialized into new roles. According to Ibarra, people form professional identities when adapting to new positions via three basic processes: identifying possible identities by observing role models, experimenting with provisional selves, and evaluating the results based on internal and external feedback. Key to the author's framework for workplace identity development is the process involved in building a repertoire of possible selves, which is accomplished through close observation of prototypical role models. This framework for learning and socialization in the workplace is consistent with the models of observation and experimentation described by social learning theory (Bandura, 1977), as well as the identity prototyping processes predicted by social identity theory (Turner & Tajfel, 1986).

Ibarra's research on professional adaptation may have important implications for how employees can develop mindfulness when entering new professional roles. As career transitions often demand the acquisition of new skills, behaviors, and interaction patterns, they can lead to marked changes in an employee's self-definition and professional identity (Ibarra, 1999). During the early stages of role adaptation, employees are likely to look to their direct supervisors for information regarding effective skills, attitudes, professional styles, and routines that can eventually be integrated into their own professional identities and self-concepts. Therefore, as part of their efforts to socialize new team members, mindful leaders may send influential signals to employees regarding the importance of cultivating mindfulness at work. At the same time, new employees may observe and imitate mindful leaders in their efforts to construct well-adapted professional identities when entering new roles.

Apart from the more effortful cognitive processes associated with observation and imitation in the workplace, emotions may also play an important role in terms of how leaders can influence mindfulness development among followers. Research on mindfulness training interventions suggests that dispositional changes in mindfulness occur by evoking heightened and more frequent mindfulness states (Kiken et al., 2015). Similarly, theoretical frameworks for trait development in adulthood have posited that long-term personality development occurs through repeated situational processes that produce trait-relevant states (Wrzus & Roberts, 2017). This research suggests the possibility that leaders can cultivate follower mindfulness by fostering emotional conditions in the workplace that are more conducive to follower mindfulness states.

The phenomenon of emotional contagion stands out as being relevant for understanding how mindful leaders might influence the emotional states of followers. Emotional contagion describes the tendency for individuals to synchronize their emotions with those around them

through automatic mimicry of expressions, vocalizations, and movements (Hatfield et al., 1993). Research has indicated that emotional contagion can be particularly powerful in leader-follower relationships. For example, an experiment conducted by Sy et al. (2005) demonstrated that when leaders were in a positive mood, group members experienced a more positive and less negative mood and that groups collectively had a more positive and less negative emotional tone. The authors also found that groups exhibited more coordination and less effort when leaders were in a positive mood. Similarly, Johnson (2008) reported that leader positive affect and negative affect at work predicted follower positive affect at work, as moderated by follower susceptibility to emotional contagion. The author demonstrated similar findings in a controlled laboratory experiment, in which followers demonstrated higher levels of positive emotions when exposed to a speech from leaders who had received a positive mood induction versus a negative mood induction (Johnson, 2009).

Emotional contagion may have important implications for how mindful leaders can create conditions that are conducive to follower mindfulness for two main reasons. First, mindfulness has been associated with a more positive and less negative emotional tone. This finding has been demonstrated by a meta-analysis (Sedlmeier et al., 2012), and it has also been theorized that the attentional presence associated with mindfulness may prevent persistent negative thoughts about past experiences and anticipated futures (Good et al., 2016). This research suggests that mindful leaders are more likely to experience positively toned emotions and less likely to experience negative emotions in the workplace. Accordingly, followers may “catch” these positive emotions through emotional contagion in their interactions with mindful leaders. This claim is supported by recent research demonstrating a positive association between leader mindfulness and follower positive emotions (Pinck & Sonnentag, 2018).

The second implication of mindfulness for emotional contagion is related to emotional reactivity. Some studies have indicated that mindfulness is associated with reduced reactivity to emotional stimuli (Good et al., 2016). Specifically, dispositional mindfulness has been associated with lowered negative affect after exposure to stressors (Arch & Craske, 2010), and neurological studies have demonstrated that mindful individuals show less threat-related neural activity after exposure to negative facial expressions (Creswell et al., 2007). These findings suggest that mindful leaders may be able to maintain more neutral emotional states when faced with stressful stimuli in the workplace. Accordingly, they will be less likely to spread negative emotions to followers through emotional contagion when confronted by negative stressors at work, which may help to nurture conditions that are supportive of follower mindfulness states.

One might contend that more neutral responses to emotional stimuli might also prevent leaders from spreading positively toned emotions to followers. Indeed, neurological studies have shown that mindfulness reduces reactions to positive emotional stimuli (Brown et al., 2013). Furthermore, emotional contagion is more likely to occur with high arousal moods such as elation or distress (Hatfield et al., 1994). It is possible that mindful leaders miss out on opportunities to spread strong positive emotions to followers due to dampened reactions to positive stimuli. However, when it comes to creating conditions that are conducive to follower mindfulness, a leader's emotional stability and overall emotional tone are likely more relevant. When leaders are low in mindfulness, they may be more susceptible to emotional peaks and troughs as positive and negative emotional stimuli emerge unpredictably at work. Followers will be susceptible to this emotional volatility via emotional contagion through their interactions with low-mindfulness leaders, which may create conditions that hinder mindfulness development.

On the other hand, mindful leaders may be able to reduce emotional contagion by maintaining more stable and generally positive emotional states when confronted by emotional stimuli in the workplace (Good et al., 2016). For low-mindfulness followers, emotional contagion via interactions with mindful leaders may help them to maintain more stability and positive emotionality at work, which may facilitate their mindfulness development over time. At the same time, the emotional stability of mindful leaders may render them less susceptible to upward emotional contagion from exposure to low-mindfulness followers. Followers who are high in mindfulness may be less susceptible to emotional volatility from non-mindful leaders. However, it may be difficult for followers to maintain this stability under prolonged conditions of high emotional volatility from leaders.

In sum, leaders are likely to be highly influential role-senders for their followers given the hierarchical structure of most workplaces (Dienesch & Liden, 1986). This section of the study has offered a theoretical framework for how mindful leaders can facilitate mindfulness among their followers by serving as role models for social learning, shaping group social identities, acting as prototypes for professional adaptation, and nurturing more positive and stable emotional conditions. Given their prominent role in workgroups, it is also possible that leaders can cultivate mindfulness through their direct influence on key work-related experiences that have been shown to impact employee mindfulness, such as job design (Lawrie et al., 2018) and climate perceptions (Reb et al., 2015). Furthermore, it is conceivable that mindful leaders might even be skilled practitioners of mindfulness themselves, and actively incorporate mindful practices into their approach to managing and training their teams. These practices could facilitate the adoption of mindful habits among followers in their day-to-day behavior at work. Based on the rationale outlined thus far, the following hypothesis is offered:

Hypothesis 1: Leader mindfulness is positively related to follower mindfulness.

The Role of Leader-Member Exchange

Leader-member exchange (LMX) is a theory that focuses on the quality of relationships between leaders and their subordinates. In its original form, the theory was referred to as “vertical dyadic linkage” (VDL), which posited that supervisors develop differentiated relationships with their subordinates due to time and resource limitations. The process of differentiating between followers entails the establishment of distinct subordinate in-groups and out-groups (Dansereau Jr et al., 1975; Graen & Cashman, 1975; Graen et al., 1982). In-group leader-follower exchange relationships are considered high quality because they go beyond what is required by the employment contract and are distinguished by higher levels of mutual trust, respect, liking, and reciprocal influence (Dansereau Jr et al., 1975). By contrast, out-group LMX relationships are guided primarily by contractual obligations and are characterized by lower levels of trust, support, interaction, and rewards (Dienesch & Liden, 1986). By differentiating between individual leader-follower relationships within the workgroup, the VDL approach departed from earlier leadership theories that were based on the “average leadership style” (ALS) approach, which assumes that the workgroup should always be treated as a singular entity and are thus managed uniformly by leaders (Dansereau Jr et al., 1975). In support of the VDL perspective, research has indicated that the vast majority of workgroups demonstrate within-group differences in the quality of leader-follower relationships (Liden & Graen, 1980).

Beyond the original VDL focus on dyads within workgroups, LMX research has evolved to explore the dynamics and implications of leader-follower relationships across multiple levels of analysis, including individuals, dyads, and groups (Mayer, 2004). In the leadership-making model of LMX, the focus was shifted from the development of differentiated relationships to the process

and implications of building high-quality relationships with all followers (Graen & Uhl-Bien, 1995). Researchers applying the leadership-making framework found that leaders could improve average levels of subordinate retention and performance by pursuing high-quality LMX relationships with all group members rather than giving preferential treatment to a select few (Graen et al., 1982; Graen et al., 1986). These findings contrasted with the VDL assumption that within-group differentiation is the best approach to managing teams and highlighted the theoretical and practical importance of considering the group-level effects of LMX. Indeed, evidence supporting both VDL and ALS perspectives has led LMX researchers to advocate for a “multiplexed approach” to studying leader-follower relationships, examining within- and between-group LMX effects when relevant (Schriesheim et al., 1998).

Past research has shown the quality of leader-follower relationships to be a significant predictor of important subordinate attitudes and behaviors. Numerous studies have reported a positive relationship between LMX quality and subordinate attitudinal outcomes such as job satisfaction (e.g. Bhal & Ansari, 2007), organizational commitment (e.g. Eisenberger et al., 2010), as well as a negative relationship with turnover intentions (e.g. Ansari et al., 2007). LMX quality has also been positively linked to important subordinate behavioral outcomes such as performance (e.g. Dunegan et al., 2002), organizational citizenship behaviors (e.g. Sun et al., 2013), and negatively with counterproductive work behaviors (e.g. Thiel et al., 2018). A meta-analysis of 290 independent samples provided overall support for these findings and demonstrated a strong connection between LMX and other important subordinate attitudes and behaviors such as higher levels of follower satisfaction with their supervisor, perceptions of procedural justice, and reduced role ambiguity and employee turnover (Dulebohn et al., 2012). Overall, research on LMX has

demonstrated substantial evidence for the importance of the quality of leader-follower relationships in determining key outcomes for subordinates.

When considering the possible connection between leader mindfulness and follower mindfulness, the quality of LMX relationships between group members and their leader may be an important condition for determining its strength. One implication of LMX is that high-quality leader-follower relationships can increase workgroup salience. Research has shown that higher levels of LMX are related to greater social identification with the workgroup (Herman et al., 2012). As employees identify more strongly with their workgroups, group membership should become more psychologically salient concerning their attitudes and behaviors, following social identity theory (Turner & Tajfel, 1986). Moreover, LMX has been positively associated with follower ratings of leader satisfaction (Dulebohn et al., 2012) and perceptions of leader effectiveness (Deluga, 1998), both of which may be related to increased workgroup salience among followers (Hogg et al., 2005). Accordingly, followers in high-quality relationships with their supervisor may be more likely to derive a larger component of their social identities from workgroup membership. Furthermore, research has also demonstrated a connection between LMX and higher levels of relational identification with leaders (Gu et al., 2015; Niu et al., 2018), which can be associated with increased perceptions of leader group prototypicality (Yoshida et al., 2014). With these findings in mind, followers should be more likely to view leaders as prototypical models for effective workgroup membership when they are in high-quality LMX relationships.

Thus, social identity theory offers a basis for why LMX should strengthen the association between leader mindfulness and follower mindfulness. Employees who perceive themselves as having high-quality leader-follower relationships will be more likely to look to workgroups as an important influence for shaping their self-conceptions, and mindful leaders will serve as an even

more influential source of normative information in terms of prototyping appropriate workgroup attitudes and behaviors. Furthermore, the increased prototypicality of high-quality LMX leaders may have implications for follower professional identity development, following Ibarra's (1999) model of professional adaptation. When followers are in high-quality LMX relationships they may be more likely to consider leaders as suitable role models for effective skills and professional styles while adapting to new roles. Accordingly, mindful leaders may be more effective role models for cultivating mindfulness at work when fostering high-quality LMX relationships during follower socialization.

Social exchange theory (Blau, 1964) offers an additional basis for why stronger relationships may facilitate the connection between leader and follower mindfulness. In a social exchange conceptualization of LMX, high-quality leader-follower relationships are nurtured through a mutual sense of trust regarding the reciprocation of valued behaviors (Bernerth et al., 2007; Liden & Graen, 1980). In the case of mindful leaders, demonstrations of workplace mindfulness among followers may be offered as a valued commodity that reflects competence and appropriate normative conduct. Followers may choose to incorporate mindfulness into their behaviors and attitudes at work to fulfil their obligations for mutual reciprocation, thereby facilitating the development and maintenance of high-quality LMX relationships with leaders. As a result, followers in high-quality LMX relationships should be more likely to incorporate mindfulness into their behavior and interactions with mindful leaders, which may help them cultivate greater mindfulness over time.

The above arguments suggest that follower perceptions should play a central role in determining how LMX influences the relationship between leader and follower mindfulness. While supervisors may have positive views of their LMX relationships, if followers do not share

the same views, they would not be expected to derive a large component of their social and professional identities from those relationships. In line with the research cited above (Herman et al., 2012; Dulebohn et al., 2012; Gu et al., 2015; Niu et al., 2018), follower LMX perceptions should correspond most closely with how strongly followers identify with workgroup relationships and whether they will view leaders as prototypical group members or models of successful workplace behavior.

As follower perceptions of LMX have been conceptualized as both a property of individuals within groups (Henderson et al., 2008) and as a shared property of groups (Mayer, 2004), the idea that LMX can strengthen the top-down effect of leader mindfulness on follower mindfulness introduces the possibility of two distinct interaction effects. The mathematical structure of the corresponding levels of analysis will be described in detail in the analytical strategy section. Conceptually, a within-group interaction concerns a differential effect based on the individual's relative LMX standing within the group but does not say anything about the strength of the overall effect of the leader's mindfulness on followers. By contrast, a positive between-group interaction would indicate that a leader's mindfulness "spills over" to followers in groups with higher-quality LMX overall. This relationship corresponds to the primary objective of this research and is consistent with a social identity theory framework, in which group members assess the suitability of leaders as prototypes for group social identities via consensual, group-based attributions of liking and attractiveness (Hogg, 2001; Hogg & van Knippenberg, 2003). Hence, the following hypothesis is proposed:

Hypothesis 2: Follower perceptions of LMX moderate the relationship between leader mindfulness and follower mindfulness at the group level, such that the relationship is stronger when LMX quality is high compared to when it is low.

Follower Outcomes of Mindfulness

As outlined previously, recent studies have demonstrated a beneficial relationship between leader mindfulness and follower performance and well-being outcomes (e.g., Reb et al., 2014). While there is some evidence for the connection between higher levels of leader mindfulness and beneficial follower outcomes, there remains a shortage of empirical research investigating these relationships and a limited understanding of how mindful leaders exert a positive influence on their followers. To explain how mindful leaders impact followers, some studies have examined the mediating role of specific leadership constructs, such as transformational leadership (Pinck & Sonnentag, 2018) or procedural justice enactment (Schuh et al., 2019). Based on the theorizing that has been presented in this paper thus far, another possibility is that mindful leaders facilitate follower performance and well-being indirectly by cultivating mindfulness among followers. Considering the growing body of evidence showing the positive intra-individual connection between dispositional mindfulness and employee performance and well-being (Good et al., 2016; Lomas et al., 2017), the theorized connection between leader mindfulness and follower mindfulness may have downstream implications for important follower outcomes in these domains. The following section will examine two specific dimensions of employee performance and well-being that may be indirectly influenced by leader mindfulness via follower mindfulness: in-role performance and subjective well-being.

In-role Performance

In-role performance is the core set of behaviors that an employee is expected to fulfill in his or her formal work role, as typically reflected in the job description. As previously discussed, multiple studies have found a positive connection between dispositional mindfulness and in-role performance (e.g., Dane & Brummel 2014; Beach et al., 2013). In terms of how this occurs, authors

have theorized that mindfulness can impact employee performance through many cognitive and affective processes. For example, Glomb et al. (2011) outlined several mindfulness-based processes that could influence workplace performance, such as greater response flexibility, decreased rumination, improved affective regulation, and increased working memory. These authors argued that such features of mindfulness should improve workplace performance by facilitating improved decision making, communication, concentration, creativity, and ability to perform under stress.

Some researchers have argued that the connection between mindfulness and performance may be contextually dependent. Focusing on one feature of mindfulness – widened internal and external attentional breadth – Dane (2011) developed a contingency theory predicting that the direction of the relationship between mindfulness and task performance should depend on the work context. The author claimed that widened attention to external phenomena would only be helpful when performing tasks that require the individual to be attuned to a large number of stimuli. Regarding widened internal attentional breadth, it was argued that mindfulness would foster performance only when individuals have accurate intuitions that are rooted in sufficiently complex domain-relevant schemas. Accordingly, Dane’s theory posited that mindfulness should have a positive relationship with task performance when one is performing in a dynamic work environment and has a high level of task-relevant expertise. Conversely, mindfulness would be negatively related to task performance in static environments, and when expertise is low.

While acknowledging that widened attentional breadth may enhance performance to a greater degree in complex and dynamic work environments, Good et al. (2016) contended that the benefits of mindfulness for employee performance could be generalized more broadly even to include routine contexts due to other features of mindfulness that were left out by Dane’s theory.

Specifically, the authors argued that mindfulness should benefit performance more generally due to the features of enhanced attentional stability, control, and efficiency. For example, the authors posited that greater attentional control and stability should reduce errors in routine jobs where individuals may be susceptible to lapses in concentration. In addition to improving mean performance levels, it was argued that mindfulness could attenuate within-person performance variability due to heightened attentional stability and behavioral regulation. Furthermore, they explained that the greater attentional control and cognitive flexibility of mindful individuals should buffer performance levels during periods of stress and emotional intensity.

Overall, while mindfulness may be more valuable for performance in certain types of roles and work environments, there is theoretical and empirical support for the positive relationship between mindfulness and in-role performance across various contexts. As discussed previously, in addition to this intra-individual association, there is also some recent empirical support for the interpersonal connection between leader mindfulness and follower in-role performance (Reb et al., 2014; Reb et al., 2019; Schuh et al., 2019). In attempting to explain this relationship, authors have examined the role of a variety of mediating mechanisms, including psychological need satisfaction (Reb et al., 2014), interpersonal justice (Reb et al., 2019), and procedural justice enactment (Schuh et al., 2019). Given the direct connection between dispositional mindfulness and performance, the theorizing in this paper suggests another possible pathway that may explain the association between leader mindfulness and follower performance. Specifically, mindful leaders may indirectly facilitate follower in-role performance through their direct role in promoting follower mindfulness, as moderated by LMX. Thus, the following hypothesis is offered:

Hypothesis 3: Follower mindfulness mediates the positive indirect effect of leader mindfulness on follower in-role performance as moderated at the group level by follower LMX, such that the

indirect effect of leader mindfulness on follower in-role performance is stronger when LMX quality is high compared to when it is low.

Subjective Well-being

In broad terms, the concept of well-being refers to feelings of satisfaction with life and “optimal psychological functioning and experience” (Ryan & Deci, 2001, p. 142). Well-being research typically focuses on two distinct perspectives: hedonic and eudaimonic well-being. From the eudaimonic view, well-being is thought of prescriptively in terms of what constitutes a positive and meaningful life, including experiences such as self-realization, growth, authenticity, and the pursuit of meaning (Sonnentag, 2015). The hedonic perspective is commonly referred to as “subjective well-being,” which views well-being in terms of the affective and cognitive judgements that people make regarding their personal happiness and life satisfaction. These can be global judgements concerning one’s overall experience of pleasant emotions and general feelings of life satisfaction, or domain-specific assessments, such as satisfaction with work or relationships (Diener, 2000). The current study examines employee well-being from the hedonic perspective, with the goal of examining how mindfulness can relate to one’s subjective feelings about their global psychological functioning and experiences.

There may be multiple features of mindfulness that can promote employee subjective well-being. For example, mindfulness is thought to influence emotions through its impact on the types of stimuli that receive attention and how they are evaluated (Good et al., 2016). Mindful states can enable a “decentred perspective” (Bishop et al., 2004), in which stressful stimuli will be observed with an attitude of acceptance and an open and non-judgemental awareness (Brown et al., 2007). Correspondingly, studies have demonstrated that mindfulness is associated with reduced reactivity to negative stressors (Arch & Craske, 2010) as well as faster recovery from negative affective

states (Keng et al., 2013). These aspects of mindfulness may have implications for how individuals respond to stressful situations at work. As a result of accelerated emotional lifecycles and reduced emotional reactivity, mindfulness should reduce the amount of regulation and self-control that is required to handle emotionally demanding situations. Thus, mindfulness may improve well-being by equipping employees with greater mental and emotional resources to help them cope and be more resilient in the face of challenging workplace demands.

An additional feature of mindfulness that may promote subjective well-being is higher levels of autonomous self-regulation. Research has shown that mindful individuals are more likely to regulate their behavior in a manner that is congruent with their personal needs, values, and interests (Brown & Ryan, 2003). In contrast to more automatic and controlled forms of self-regulation, autonomous regulatory behavior requires less effortful inhibition and leads to reduced ego depletion and greater vitality (Ryan & Deci, 2008). Accordingly, as argued by Hülshager et al. (2013), individuals who are high in mindfulness should be better able to conserve mental and emotional resources by engaging in more volitional and autonomous forms of self-regulation when confronted by stressors at work, thereby reducing the employee's likelihood of becoming exhausted emotionally and protecting their affective well-being. In support of these arguments, multiple empirical studies have demonstrated a strong positive relationship between mindfulness and subjective well-being (e.g., Schutte & Malouff, 2011; Bajaj & Pande, 2016; Jin et al., 2020).

As mentioned previously, recent studies have begun to investigate follower well-being as a potential interpersonal correlate of leader mindfulness (Reb et al., 2014; Pinck & Sonnentag, 2018; Schuh et al., 2019). To explain this connection, Pinck and Sonnentag (2018) argued that mindful leaders may promote follower well-being through higher levels of transformational leadership behaviours. The authors demonstrated empirical support for this claim, with

transformational leadership mediating the effect of leader mindfulness on multiple measures of follower well-being. Schuh et al. (2019) found that higher levels of leader procedural justice enactment mediated the negative relationship between leader mindfulness and follower emotional exhaustion, a condition that is closely related to and has been shown to impair subjective well-being (Lee et al., 2020). Similar findings were reported by Reb et al. (2014) who found a negative relationship between leader mindfulness and follower emotional exhaustion, as well as Reb et al. (2019), who found a direct negative association between leader mindfulness and follower stress. Considering the proposed role of leaders for promoting follower mindfulness, together with strong evidence for the intra-individual connection between mindfulness and well-being, another possible explanation for the association between leader mindfulness and follower well-being is through the leader's role in facilitating follower mindfulness. In other words, mindful leaders may indirectly promote the subjective well-being of followers by fostering higher levels of follower mindfulness, as moderated by LMX. Accordingly, the following hypothesis is proposed:

Hypothesis 4: Follower mindfulness mediates the positive indirect effect of leader mindfulness on follower subjective well-being as moderated at the group level by follower LMX, such that the indirect effect of leader mindfulness on follower subjective well-being is stronger when LMX quality is high compared to when it is low.

METHOD

Procedure

Data were collected from administrative staff working for a medium-sized public sector organization in a western Canadian city. Contact information of employees and their direct supervisors was provided to the primary researcher by the Human Resources Manager of the organization. Prior to the delivery of survey invitations, employees were informed of the study via email communication sent by the City's Human Resources Department (see Appendix A for communication template). Two days after the initial communication, supervisors received email invitations from the Qualtrics survey platform with a personal link to the leader questionnaire. The invitations contained a list of the supervisor's direct subordinates with a unique confidential reference code for each. To facilitate matching leader and follower responses, supervisors were instructed to refer to the list of codes while completing the subordinate assessment, without requiring names to be entered directly in the questionnaire. Followers were sent personal links to the follower questionnaire, and their unique reference codes were embedded within the link. Before beginning the questionnaire, all participants completed informed consent explaining the purpose of the study, that participation was voluntary, and that answers will be kept confidential. Participants were also informed that there were no direct incentives being offered for completing the study. Data collection took place over 3 weeks, with reminders being sent out each week. Before collecting data, approval for the study was granted by the University of Lethbridge research ethics committee.

Participants

A total of 312 followers and 79 leaders who were employed by the partner organization and were at least 18 years of age were invited to participate in the study. Out of the pool of eligible participants, 197 follower survey responses (63% participation) and 58 leader survey responses (73% participation) were collected. By the partner organization's request, the follower questionnaire was delivered to all workers in the employer's Work-From-Home program, including some who worked part-time and had low tenure. For analyzing the relationship between leader and follower mindfulness, the results exclude followers who indicated they had less than 3 months of dyadic tenure (4 followers; 2.0%) or who worked part-time (7 followers; 3.5%) or did not provide this datum (2 followers; 1.0%).¹ The analysis also excluded one extreme outlier (0.5%).² This yielded a usable sample of 183 followers and 58 leaders (94.5%).

In terms of demographics, 56.8% of follower questionnaire participants were female, and the average age was 42.8 years ($SD = 11.5$). On average, followers had 9.5 years of organizational tenure ($SD = 7.9$) and 18.3 years of total work experience ($SD = 9.0$). The majority of followers occupied the position level of Entry-level/Clerk/Line employee (24.6%) or Analyst/Associate (58.1%). Most followers had obtained a bachelor's degree or higher (58.6%). Among leaders, 34.5% were female and the average age was 47.5 years ($SD = 8.7$). On average, leaders had 11.5 years of organizational tenure and 23.2 years of total work experience. The majority of leaders

¹ The 3-month tenure/full-time condition was imposed to ensure that stable leader-follower relationships had been formed (Graen & Scandura, 1987) and to give comparable opportunity for supervisor influence and group clustering to take effect.

² This participant reported uniquely low mindfulness (1.15 on scale of 1-6; 3.7 SD s below mean), as well as a subjective well-being score at the bottom of the scale (1.0 on a scale of 1-6; 3.3 SD s below mean). To avoid having the results skewed by a single outlier, this case was excluded from the analysis. Note that the outlier case had no impact on the study's conclusions; however, some bias was apparent in aggregate estimates of within-group variance.

indicated that their position level was Manager (58.6%) or Senior Manager (20.7%). Most leaders had obtained a bachelor's degree or higher (65.5%).

The issue of missing data was addressed using pairwise deletion, employing all cases with complete data on the relevant test variables at each stage of testing (also known as the available-case method; Kim & Curry, 1977). Multi-level testing restricted the usable set of data to those followers who were members of groups in which the supervisor plus two or more group members completed their questionnaire and answered the relevant questions, per the recommendation of Nezlek (2012). A total of 41 supervisors who submitted their mindfulness scores were matched with 2 or more of their followers who provided mindfulness scores (136 matched pairs; average group size = 3.3). For tests that required at least two matched ratings on LMX, mindfulness, and complete data on leader and follower control variables, the restricted set comprised a total of 31 supervisors and 104 matched pairs (average group size = 3.4).

Dropout analysis on the restricted dataset used in multi-level testing showed that the excluded followers were not significantly different in terms of key demographics such as age, sex, education, organizational tenure, or work experience. There was also no significant difference in terms of follower mindfulness ($M = 4.43$, $SD = .79$ for included, $M = 4.49$, $SD = .85$ for excluded) or LMX ($M = 5.56$, $SD = 1.06$ for included, $M = 5.52$, $SD = 1.07$ for excluded). Dropout analysis for leaders indicated that the excluded leaders were not significantly different in terms of their age, sex, education, organizational tenure, or work experience. There was also no significant difference in terms of leader mindfulness ($M = 4.16$, $SD = .79$ for included; $M = 4.24$, $SD = .65$ for excluded). These results provide confidence that attrition did not impact the results.

Measures

Mindfulness. Leader and follower mindfulness were measured using 13 items from the Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003), which allows for concise measurement of mindfulness for individuals without prior meditation experience (Bergomi et al., 2013). MAAS has been used widely in prior research examining mindfulness as a unidimensional construct. Multidimensional scales such as the Five Facet Mindfulness Questionnaire (Baer et al., 2006) were not employed because my theorizing does not entail differential effects of possible sub-dimensions of mindfulness. Although MAAS and the self-rated approach to mindfulness research have been criticized (e.g., Grossman, 2008, 2011), prior validation studies have found this instrument to be an appropriate measure of mindfulness (Carlson & Brown, 2005; MacKillop & Anderson, 2007). Two items from the original 15-item scale were dropped, as confirmatory factor analysis demonstrated factor loadings below .50 (item 6: “I forget a person’s name almost as soon as I have been told it for the first time”, and item 15: “I snack without being aware that I am eating”; $\lambda = .33$ and $\lambda = .46$, respectively). Sample items from the 13-item scale include “I find it difficult to stay focused on what’s happening in the present” and “I drive places on “automatic pilot and then wonder why I went there.” Leaders and followers rated each item on a 6-point scale (1 = *almost always*, 6 = *almost never*), with low scores indicating a lack of mindfulness. Cronbach’s alpha of this scale reached acceptable reliability at .91. Reliability did not improve via the elimination of any items.

Leader-Member Exchange (LMX). The quality of the leader-member exchange relationship was measured from the follower’s perspective using the 12-item LMX-MDM scale from Liden and Maslyn (1998). Although the LMX-MDM consists of 4 subcategories (affect, loyalty, professional respect, and perceived contribution), it is commonly employed as a global measure

of LMX when theorizing does not concern relationship subdimensions (Joseph et al., 2011). Furthermore, validation studies have demonstrated support for using this scale to measure LMX as a higher-order construct, and found that it improves upon other commonly used scales (e.g., LMX-7; Scandura & Graen, 1984; see also Graen & Uhl-Bien, 1995) in capturing the complete theoretical domain of LMX (Liden et al., 2015). LMX scores were computed as a linear composite containing all four subcategories, following Greguras and Ford (2006). Sample items include “My supervisor is a lot of fun to work with” and “I am impressed with my supervisor’s knowledge of their job.” Participants were asked to indicate their agreement/disagreement with each item about their relationship with the current immediate supervisor. Item responses ranged from 1 = *strongly disagree* to 7 = *strongly agree*, with low scores indicating poor LMX quality. Cronbach’s alpha for this scale reached acceptable reliability at .93. Although reliability improved slightly ($\alpha = .94$) when eliminating item 7, all items were retained to preserve comparability with supervisor LMX ratings.

Supervisor Leader-Member Exchange (SLMX). As LMX involves the perspectives of two members in a dyadic relationship, the quality of LMX was also measured from the leader’s standpoint. To capture the leader’s LMX perceptions, the leader questionnaire included the 12-item SLMX scale developed and validated by Greguras and Ford (2006). The SLMX scale is a parallel measure to Liden and Maslyn’s (1998) LMX scale, reframing the same items to capture the leader’s perceptions. For example, “I like my supervisor very much as a person” is translated to “I like my subordinate very much as a person.” Participants were asked to indicate their agreement/disagreement with each item about their relationship with the respective subordinate. Item responses ranged from 1 = *strongly disagree* to 7 = *strongly agree*, with low scores indicating

low supervisor LMX. Cronbach's alpha for this scale reached acceptable reliability at .91, and reliability did not improve via the elimination of any items.

Subjective Well-being. Both leaders and followers were asked to rate their subjective well-being using the 6-item short version of the 22-item Psychological General Well-Being Index (Dupuy, 1984). The shortened 6-item scale (PGWBI-S) was tested by Grossi et al. (2006) and found to have appropriate validity and reliability. Sample items include "I felt downhearted and blue during the past month" and "I felt cheerful, lighthearted during the past month." Responses options covered a 6-point scale (e.g., 1 = *none of the time* to 6 = *all of the time*), with low subjective well-being indicated by low scores for items 1, 4, and 5 and low subjective well-being indicated by high scores for the reverse-coded items 2, 3, and 6. Cronbach's alpha for this scale reached acceptable reliability at .89, and reliability did not improve by eliminating any items.

In-role Performance. Leaders assessed follower performance using the scale developed and validated by Williams and Anderson (1991). The authors created this 7-item scale by introducing an additional four items to the measure developed by O'Reilly and Chatman (1986) and demonstrated that in-role performance could be distinguished from other extra-role performance behaviors (i.e., organizational citizenship behavior; Williams & Anderson, 1991). Sample items include "This particular employee fulfils all the responsibilities specified in his/her job description" and "This particular employee adequately completes all assigned duties." Items were assessed using a 7-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*, with higher scores indicating better performance. Two scale items that were worded as negative indicators of performance were reverse-coded, with lower scores indicating better follower performance. Cronbach's alpha for this scale showed acceptable reliability at .95, and reliability did not improve when eliminating any items.

Control variables. Positive affect and negative affect were included as control variables because prior research suggested their close association with study variables (e.g., Giluk, 2009), constituting a plausible threat to construct validity (Becker et al., 2016), and because participant mood states have been shown to introduce systematic error in survey responses (Podsakoff et al., 2003). Affect was measured using the 10-item, short-form Positive and Negative Affect Scale (PANAS) shortened and validated by Thompson (2007). Participants were asked to indicate how they have been feeling over the past couple of weeks with respect to each of the 5 positive items and 5 negative items. Coefficient alphas were .86 and .82 for negative and positive affect subscales, respectively. Age and sex were also included as demographic control variables in line with previous related studies (Pinck & Sonnentag, 2018; Zhang et al., 2020) and because of demonstrated associations with study variables (Gutierrez et al., 2005; Zhu et al., 2020; Mahlo & Windsor, 2021).

Work-from-Home Data. As the partner organization had recently transitioned its workforce to remote work following the onset of the COVID-19 pandemic, additional data were collected to help with the organization's efforts to understand how the organization can support employees in the work-from-home setting. These data facilitated an examination of how the frequency, mode, and topic of remote leader-follower interactions impacted followers and their perceptions of leader effectiveness. Leaders were asked to provide information on the types and frequency of interactions with their groups as a whole. Followers were asked to provide information on their one-on-one interactions with leaders. Participants were also asked about their level of satisfaction

with the work-from-home arrangements and their preferences with respect to working from home in the future.³ Findings related to work-from-home data are included in Appendix C.

DATA ANALYSIS

Analytical Strategy

To accommodate the nested structure of the data (followers nested under leaders), tests were performed using Hierarchical Linear Modelling (HLM) via the lme4 package in RStudio (Bates et al., 2015). Tests for cross-level direct and mediated effects follow the unconfounded 2-1-1 design described by Preacher et al. (2011), and tests involving multilevel moderation follow the procedures outlined by Aguinis et al. (2013). Tests of the full hypothesized model reflect Edwards and Lambert's (2007) first-stage moderated mediation model. Figure 1 illustrates the decoupling of within and between components in the unconfounded cross-level research model. The unmoderated effects of leader mindfulness (H1) are represented by the horizontal solid arrows. Because the predictor variable (leader mindfulness) is a global unit property (i.e., originates at Level 2), it cannot on its own account for within-group variance in Level-1 outcomes (Preacher et al., 2011).

INSERT FIGURE 1 HERE

As depicted by the vertical solid arrow in Figure 1, LMX is aggregated to the between-group level (mean group-level LMX) to test its interaction with leader mindfulness. This model corresponds to my theoretical framework and primary research focus on how leaders can facilitate

³ Other supplementary measures that were collected to support the project include Perceived Social Support (Morgeson & Humphrey, 2006), Work-Family Conflict (Carlson et al., 2000), Remote Leader Communication Effectiveness (Kayworth & Leidner, 2002), Leader Effectiveness (Yukl et al., 2013), and Social Desirability (Strahan & Gerbasi, 1972).

mindfulness among all their followers, rather than differential effects on particular followers within their groups.

The dashed arrows in Figure 1 illustrate how the introduction of a moderator that originates at the individual level presents the mathematical possibility of a cross-level effect moderated by a Level-1 variable, as noted by Kozlowski and Klein (2000);⁴ in this case, the possibility that leader mindfulness could influence follower mindfulness differentially within groups based on the follower's relative LMX standing compared to workgroup peers. As LMX researchers have recommended using a “multiplexed” approach by directly testing for both within- and between-group effects (Schriesheim et al., 1998), I also test for the possibility of this cross-level interaction.

Whereas ordinary least squares (OLS) regression conflates within- and between-group effects and error terms, HLM can represent the hypothesized cross-level direct effect, between-group interaction effect, and within-group interaction effect in separate terms, as illustrated by the model equations below. In step 1, the slope (β_{1j}) and intercept (β_{0j}) terms are generated for each group separately using an OLS equation regressing follower mindfulness onto LMX. In step 2, group intercept terms are modeled as a function of group-level LMX, leader mindfulness (cross-level direct effect; grand-mean centered), and the product of group-level LMX and leader

⁴Preacher et al. (2016, p. 193) state that interpretation of the gamma coefficient (γ_{11} in my model equations) representing the within-group component of the $1 \times 2 \rightarrow 1$ cross-level interaction effect assumes a reversal of roles for predictor and moderator variables, such that the level-1 variable becomes predictor and the level-2 variable becomes moderator, “rendering the research question substantively different.” However, there is no meaningful mathematical ordering to multiplicative terms: the roles of moderator and predictor in an interactive term can only be determined by theory. Andersson et al. (2014, p. 1068) identify the possibility of a reverse interaction effect in cross-level moderation models whereby the level-1 variable moderates the level-2 direct effect, but argue that “multilevel modeling can help identify the directionality of the interaction effects in that it is logical that the contextual variable moderates the relationship between lower-level variables.” Nonetheless, there could also be theoretically sound research models whereby a level-1 variable moderates the strength and/or direction of a top-down effect within groups. For example, when a leader exerts a certain style of leadership, measurable individual characteristics may shape how different followers are influenced by that behavior. For research questions of this nature, a cross-level (within-group) interaction model could be developed and tested to examine whether a certain leadership style (level 2) predicts follower outcomes (level 1) differentially within groups depending on some follower characteristic (level-1 moderator).

mindfulness (group-level interaction; grand-mean centered). Hypotheses 1 and 2 are tested via the direction and significance of gamma terms associated with the direct effect of leader mindfulness (γ_{02}) and its group-level interaction with LMX (γ_{03}). Testing for cross-level interaction (second equation in step 2) employs a random intercept and slope model to calculate the direction and significance of γ_{11} . To produce standardized coefficients, the models were re-run using z-transformed variables because the simpler equations relating standardized and unstandardized coefficients do not apply to interactive terms (Friedrich, 1982).

Variables:

x = leader mindfulness;

z = leader-member exchange;

y = follower mindfulness

j = group #; i = group member #; t represents “total” (grand mean)

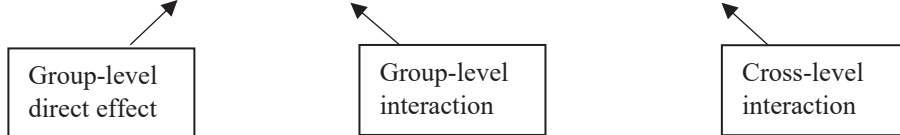
Step 1: $y_{ij} = \beta_{0j} + \beta_{1j} (z_{ij} - \bar{z}_j) + r_{ij}$

Step 2: $\beta_{0j} = \gamma_{00} + \gamma_{01} (\bar{z}_j - \bar{z}_t) + \gamma_{02} (x_j - \bar{x}_t) + \gamma_{03} (x_j - \bar{x}_t) (\bar{z}_j - \bar{z}_t) + u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11} (x_j - \bar{x}_t) + u_{1j}$

Reduced:

$Y_{ij} = \gamma_{00} + \gamma_{01} (\bar{z}_j - \bar{z}_t) + \gamma_{02} (x_j - \bar{x}_t) + \gamma_{03} (\bar{z}_j - \bar{z}_t) (x_j - \bar{x}_t) + \gamma_{10} (z_{ij} - \bar{z}_j) + \gamma_{11} (z_{ij} - \bar{z}_j) (x_j - \bar{x}_t) + u_{0j} + u_{1j} z_{ij} + r_{ij}$



The second stage of the hypothesized mediation (direct effect of follower mindfulness on subjective well-being and performance) is tested on its own via OLS regression and Within-and-Between-Analysis (WABA; Dansereau et al., 1984). First, direct relationships are tested in a

multivariate OLS model using the raw scores to determine whether there is a significant effect of mindfulness on outcome variables after controls, irrespective of the level of analysis. Next, groups of two or more followers are selected for a within-and-between-analysis using the WABA package in RStudio (O'Connor, 2019). In WABA I, the raw variable scores are separated into their within- and between-groups components, which are then correlated with raw scores to generate etas for each component. The within- and between-group etas are tested against each other to determine whether variables measured at the individual level vary primarily between groups (wholes), within groups (parts), or both within and between groups (equivocal) via the geometric *E*-test of practical significance and an *F*-test of statistical significance.

In WABA II, individual-level relationships are partitioned into their within- and between-group correlations, which are tested by themselves for practical (*R*-test) and statistical significance (*t*-test). Differences between the correlations are also tested via an *A*-test of practical significance and a *Z*-test of statistical significance. The correlation components are then calculated by weighting the correlations by the etas generated in WABA I. These components are tested in relation to each other via the *A*-test of practical significance and the *F*-test of statistical significance. The results of WABA II are taken together to determine the locus of covariance between study variables (parts, equivocal, wholes), which – in combination with the results of Hypothesis 1 and 2 – can be used to assess whether there is support for testing the full moderated mediation model at the focal level of analysis.

The full multilevel moderated mediation model is tested via the Mediation package in RStudio (Tingley et al., 2014), with lme4 mixed-effects model inputs. Estimates of indirect effects are generated using Quasi-Bayesian Confidence Intervals with 10,000 simulations. Because indirect effects at different moderator strata (e.g., +/- 1 *SD* of LMX) could not be explicitly tested

against each other (test.modmed function does not currently support lme4 model types), differences between them could not be established empirically via simulated comparisons. Instead, the indirect effects are reported separately at varying levels of LMX (+/- 1 & 2 *SD*) and estimates are provided for the precise levels of LMX at which the indirect effects become significantly different from zero at $p < .05$. Differences between indirect effects are illustrated separately at high and low levels of leader mindfulness by testing for the significance of the marginal effect of LMX at each of those fixed levels.

As leaders and followers may vary somewhat in their LMX perceptions (Gooty & Yammarino, 2011), and LMX researchers have recommended examining the perspectives of both parties (Liden et al., 2015), the interaction between leader mindfulness and LMX on follower mindfulness is also tested using the supervisor's LMX perceptions for comparison. First, WABA I procedures are used to measure the degree of within and between-dyad agreement on LMX. Then, groups of 2 or more with complete data on SLMX, mindfulness, and controls are selected for testing the interaction between leader mindfulness and SLMX, and the gamma term representing the group-level interaction is reported along with its level of statistical significance.

Results

Measurement model. To verify the independence of study variables, a confirmatory factor analysis (CFA) was completed using the lavaan package in RStudio (Rosseel, 2012) whereby a four-factor model comprising mindfulness, LMX, subjective well-being, and performance was tested against other competing models. CFA statistics for all models are summarized in Table 2. LMX items were parcelled by their four subcategorizations (affect, loyalty, respect, contribution). The full four-factor model suggested adequate fit ($\chi^2(399) = 638.27$ ($p < .001$), TLI = .89, CFI = .90, RMSEA = .07, SRMR = .07). Furthermore, the complete model fit the data better than a 3-

factor model constraining mindfulness and LMX to a single factor ($\Delta\chi^2 = 238.63, p < .001$), LMX and performance to a single factor ($\Delta\chi^2 = 217.87, p < .001$), mindfulness and subjective well-being to a single factor ($\Delta\chi^2 = 203.88, p < .001$), and a one-factor model ($\Delta\chi^2 = 1285.06, p < .001$). The superiority of the complete 4-factor model provides evidence for the discriminant validity of the measures and is an indication against the presence of common method bias (Podsakoff et al., 2003). Overall, the findings from CFA along with estimates of reliability (Cronbach's alphas between .82 and .95) provide confidence that the measures are psychometrically sound.

INSERT TABLE 2 HERE

Aggregation statistics. Because my hypotheses involve testing effects at the between-group level, aggregation statistics (ICC1 and r_{wg}) were computed to estimate the amount of within-group clustering for Level-1 measures. ICC1 provides an estimate of the proportion of a measure's total variance that is accounted for by group membership, and r_{wg} compares the observed within-group variance to an expected random variance based on a rectangular distribution of scale responses (Klein & Kozlowski, 2000). Aggregation statistics indicated the presence of some clustering on all variables: LMX (ICC1 = .16; median r_{wg} = .88), mindfulness (ICC1 = .06, median r_{wg} = .87), in-role performance (ICC1 = .22; median r_{wg} = .96), and subjective well-being (ICC1 = .11; median r_{wg} = .88).

Correlations. Descriptive statistics and intercorrelations for the leader and follower surveys are displayed in Tables 3 and 4, respectively. As shown in Table 3, there was a strong positive correlation between mindfulness and subjective well-being among leaders ($r = .71, p < .001$). There was also a significant positive correlation between leader mindfulness and positive affect ($r = .36, p < .01$) and a negative correlation with negative affect ($r = -.53, p < .001$). A surprisingly strong negative correlation was found between leader sex (female) and leader

mindfulness ($r = -.42, p < .01$). In the follower sample (see Table 4), mindfulness was closely related to subjective well-being ($r = .55, p < .001$), positive affect ($r = .44, p < .001$), and negative affect ($r = -.50, p < .001$). Follower mindfulness was positively correlated with age ($r = .33, p < .001$). There was no significant bivariate relationship between follower mindfulness and supervisor-rated performance. There was significant positive correlation between LMX and performance ($r = .28, p < .01$) and supervisor LMX and performance ($r = .78, p < .001$), which is consistent with prior LMX research (Martin et al., 2016).

INSERT TABLE 3 HERE

INSERT TABLE 4 HERE

Notably, the strong negative relationship between sex (female) and mindfulness in the leader sample was not replicated in the follower sample. ANOVA calculations with Scheffé comparisons of leaders and followers confirmed that female leaders rated themselves significantly lower in mindfulness ($M = 3.79, SD = .72$) relative to all other comparison groups: female followers ($M = 4.40, SD = .79, p < .05$), male leaders ($M = 4.42, SD = .63, p < .05$), and male followers ($M = 4.53, SD = .84, p < .01$). Given this unexpected difference, I tested whether the result from bivariate correlations would hold up in a multivariate analysis predicting leader mindfulness that controlled for the effects of positive affect, negative affect, and sex simultaneously. Linear modeling including these individual effects together did reproduce the same significant negative effect of leader sex on mindfulness ($\beta = -.43, p < .05$). Comparison with the previous literature suggested this was likely a measurement artifact, rather than a substantive deficit in the mindfulness of female leaders [Reb, 2014; Schuh 2019 (Studies 1 & 2); and Zhang,

2020].⁵ Accordingly, tests specifying leader mindfulness as a predictor variable of follower mindfulness remove this potential bias by employing the residual from this model. I also repeated the calculations without this strategy, to monitor its impact.

Hypothesis tests. HLM models showing the cross-level direct effect of leader mindfulness and its interaction with LMX on follower mindfulness are displayed in Table 5. As shown under model 1 in Table 5, there was no significant cross-level direct effect of leader mindfulness on follower mindfulness ($H_1: \gamma = -0.03, ns$). Thus, no support was found for Hypothesis 1. In Model 2 in Table 5, there was a significant positive group-level interaction between leader mindfulness and LMX on follower mindfulness ($H_2: \gamma = 0.40, p < .05$), and the interaction effect predicted significant incremental variance in follower mindfulness ($\Delta Pseudo R^2 = 0.04., p < .05$). I also tested the model without removing the potentially biasing effect of leader sex, and the interaction term remained significant ($\gamma = 0.32, p < .05$). These results provide support for Hypothesis 2.

INSERT TABLE 5 HERE

The significant interaction between leader mindfulness and LMX is illustrated in Figure 2. As shown in the interaction plot, the two curves have noticeably different slopes at low ($-1 SD$) and high ($+1 SD$) values of LMX, with the slope increasing as LMX increases. The curves intersect below the mean value of leader mindfulness ($-0.6 SD$), and diverge at higher values, with the high-

⁵ This discrepancy suggests that female leaders in the current study context may have reported lower mindfulness than they would have otherwise, perhaps in part related to disruptions caused by the work-from-home arrangement during COVID-19. Results from the work-from-home data provide support for this interpretation. Compared to male leaders, female leaders reported greater disagreement that they can effectively lead their teams while working from home, that the time required to support their teams while working from home was manageable, and that communication with subordinates was as easy while working from home as it was in the office. It is possible that female leaders experienced greater difficulty with the transition to remote work due to differences in preferred communication styles. It is also plausible that female leaders faced a greater challenge in balancing job and family demands during the pandemic compared to other workers. One indication is that female leaders reported higher levels of work-family conflict compared to any other group (male leaders, female followers, and male followers). Leaders—both male and female—were also more likely than followers to be living with children and/or adult dependants (approximately three-quarters versus one-half).

LMX curve moving sharply above the low-LMX curve. That the two slopes are roughly centered on zero (horizontal) follows from the results of the test for Hypothesis 1, which showed that the direct effect of leader mindfulness was near zero. Whereas follower mindfulness levels in groups with low leader mindfulness are relatively insensitive to LMX, those with highly mindful leaders have higher follower mindfulness at high versus low LMX; as hypothesized, the conditional effect at high LMX is significantly higher than at low LMX ($p < .05$). Because the slopes of the two curves shown have opposite signs, the difference from zero of each conditional effect at $\pm 1 SD$ LMX is less significant (both $p < 0.1$). A region of significance analysis was performed (see Bauer & Curran, 2005) to calculate the range of values for LMX in which leader mindfulness becomes a significant predictor of follower mindfulness at $p < .05$ (with the covariance between the coefficients for leader mindfulness and the interaction term calculated at 0.0020). Leader mindfulness became a negative predictor of follower mindfulness at the $p = .05$ level of significance when $LMX = -0.73$ ($-1.10 SD$), and a significant positive predictor when $LMX = 0.89$ ($+1.33 SD$), respectively (unstandardized and centered values). Both values are within the meaningful and observed range for LMX.

INSERT FIGURE 2 HERE

Following the recommendation of Schriesheim et al. (1998) to use a “multiplexed” approach when relevant, I also tested for the possibility of cross-level interaction between leader mindfulness and within-group LMX on follower mindfulness. The cross-level interaction term did not reach its significance level ($\gamma = 0.002$, *ns*), indicating that the findings in Hypothesis 2 are not homologous across levels of analysis.

As discussed in the analytical strategy, the model tested above for Hypothesis 2 constitutes the first stage of hypothesized moderated mediation models for indirect effects on performance

and subjective well-being. As a preliminary test for the second stage, direct relationships between mindfulness and well-being and performance were tested via raw score OLS regression models and WABA procedures. The results of multivariate regression with mindfulness predicting subjective well-being and in-role performance are displayed in Tables 6 and 7, respectively. The first two models in both tables include two successive sets of control variables as predictors, and the third model includes mindfulness in addition to the controls. As shown in Table 6, mindfulness had a significant positive effect on subjective well-being when adding it to the model with all control variables ($\beta = 0.25, p < .001$), and predicted significant variance over controls ($\Delta R^2 = 0.04, p < .001$). With respect to in-role performance, Table 7 shows that mindfulness had no significant effect after adding it to the model with controls ($\beta = -0.01, ns$). Hence, follower mindfulness remains a significant predictor of subjective well-being after including controls, and the relationship with performance remains non-significant.

INSERT TABLE 6 HERE

INSERT TABLE 7 HERE

The results of WABA I and WABA II for mindfulness and subjective well-being are displayed in Table 8. Both within-group correlation and between-group correlation for mindfulness and subjective well-being reached statistical significance by the *R*-test of practical significance and *t*-test of statistical significance (within: $r = .54, \theta^\circ > 30^\circ, p < .001$; between: $r = .71, \theta^\circ > 30^\circ, p < .001$). The *A* and *Z*-tests indicate no practically or statistically significant difference between these two correlations ($A = 0.22, ns; Z = 1.45, ns$). In WABA I, mindfulness was found to reside weakly at the within-group level by the *E*-test (*E* ratio = 0.72, $\theta^\circ > 15^\circ$), and at both the within- and between-group level by the *F*-test (*F* ratio = 0.81, *ns*). Subjective well-being was found to reside at both the within- and between-group levels by the *E*-test (*E* ratio =

0.77, *ns*), and by the *F*-test (*F* ratio = 0.71, *ns*). Tests for differences between the within and between components after weighting variables by their WABA I etas also showed no practically or statistically significant differences (*A* = -0.10, *ns*; *Z* = -0.52, *ns*). Overall, these results suggest that both the within- and between-group relationships contribute significantly to the total relationship (equivocal). In conclusion, WABA tests indicate that the relationship between mindfulness and subjective well-being can be examined at both levels of analysis, providing support for testing the full level-2 moderated mediation model in Hypothesis 4.

INSERT TABLE 8 HERE

Detailed WABA results are not reported here for the mindfulness–performance relationship because there was no significant raw-score correlation to be partitioned and compared. Nevertheless, WABA was undertaken to address the possibility that within- and between-level correlations could be directionally opposed (also known as a “Simpson’s Paradox”) in such a way as to mask the level-specific relationships in the raw score OLS model. That possibility was ruled out, as the within- and between-level correlations were both tested separately and both were found to be nonsignificant (within: $r = .02$, *ns*; between: $r = -.05$, *ns*). Thus, the second stage of the moderated mediation model predicting a positive relationship between mindfulness and performance was not supported, and therefore no support was found for Hypothesis 3.

Table 9 presents the results from moderated mediation models estimating the conditional indirect effects of leader mindfulness on follower subjective well-being at different levels of LMX. The estimated indirect effect was weakly positive at +1 *SD* of LMX (.19, $p = .07$), and weakly negative at -1 *SD* of LMX (-.17, $p = .06$). The indirect effect was significantly positive at +2 *SD* of LMX (.37, $p < .05$) and significantly negative at -2 *SD* of LMX (-.36, $p < .05$). To obtain an estimate for the value of LMX required to reach an indirect effect significantly different from zero

at the $p = .05$ level, I tested the moderated mediation models iteratively at higher and lower levels of LMX. The negative indirect effect reached statistical significance when LMX = $-.77$ ($-1.15 SD$) and the positive indirect effect reached significance when LMX = $.87$ ($+1.30 SD$) (unstandardized and centered values). Both values are within the meaningful and observed range for LMX.

INSERT TABLE 9 HERE

Although the indirect effects at LMX = $\pm 1SD$ were each relatively weak regarding tests for nonzero effect, they are opposite in sign with similar magnitudes, so the p -values provide a strong indication that the two effects are significantly different from each other. Based on the nature of the interaction shown in Figure 2, a significant difference between positive and negative indirect effects at low versus high LMX would be expected when leader mindfulness is high, but not when leader mindfulness is low. To examine these expectations explicitly, moderated mediations for the indirect marginal effect of LMX at low and high leader mindfulness were carried out (see lower section of Table 8). As expected, the indirect effect was significant at high leader mindfulness (0.32 , $p < .05$) but not at low leader mindfulness (-0.08 , ns). This result indicates that the indirect impact of high leader mindfulness on follower subjective well-being is significantly more positive when LMX is high ($+ 1 SD$), compared to when LMX is low ($-1 SD$). Together these results lend support for Hypothesis 4. The overall results for the hypothesis tests are summarized in Table 10.

INSERT TABLE 10 HERE

Supervisor LMX Ratings

Following the recommendation to examine LMX relationships from the perspectives of both supervisors and subordinates (Liden et al., 2015), I tested the interaction between leader mindfulness and LMX using the leader's LMX ratings (SLMX), to compare with the results found using follower ratings of LMX. In terms of how closely leaders and followers agreed on their LMX perceptions, Table 3 shows there was a significant positive correlation between LMX and SLMX ($r = .27, p < .01$). ICC1 for dyads (LMX matched with SLMX ratings) revealed that a substantial proportion of variance occurred at the between-dyad level (ICC1 = .24). In WABA I for within- versus between-dyads, the within-dyad eta was 0.62 and the between-dyad eta was 0.79. This yielded an E -ratio of 1.27 (ns) and an F -ratio of 1.64 ($p < .01$), suggesting that LMX resides at both levels of analysis, within- and between-dyads. These results are consistent with prior analyses of LMX and SLMX agreement (e.g., Schriesheim et al., 1998; Gooty & Yammarino, 2016), and indicate a reasonable level of agreement between leaders and followers on LMX, although differences in their perceptions of LMX were evident.

To test the interaction effect of leader mindfulness and SLMX on follower mindfulness, groups of two or more with complete data for leader mindfulness, SLMX, follower mindfulness, and control variables were selected, yielding a sample of 122 followers in 37 groups. Group-level aggregation statistics for SLMX indicated substantial within-group clustering (ICC1 = .31; Median $r_{vg} = .97$). Repeating the HLM tests shown in Table 4, replacing LMX with SLMX, there was no significant interaction between SLMX and leader mindfulness on follower mindfulness ($\gamma = -0.002; ns$). Hence, supervisor-rated LMX did not have the same positive moderating effect on the relationship between leader and follower mindfulness, as was found previously for follower-rated LMX.

DISCUSSION

Relationships are integral to how work gets accomplished in almost any organizational setting. In particular, relationships with leaders can be highly influential for followers given the hierarchical structure of most workplaces (Dienesch & Liden, 1986). Prior research suggests that leaders send important signals that can shape the behaviors, attitudes, identities, and emotional states of followers. The focus of this study is on the role that leaders play in facilitating one important attribute of followers—mindfulness. Many studies have demonstrated a beneficial association between mindfulness and multiple dimensions of employee performance and well-being (Good et al., 2016; Lomas et al., 2017). Thus, the question of whether follower mindfulness can be nurtured by leaders is a matter of substantial interest to organizations and employees.

This research has offered a basis for understanding how leader mindfulness can facilitate mindfulness among followers. Citing relevant theories in social psychology and organizational behavior, it was argued that leaders can serve as influential figures for promoting mindfulness development among followers, with this influence being strengthened in groups that nurture high-quality leader-follower relationships. Two predictions were offered regarding the relationship between leader and follower mindfulness and the interpersonal conditions that moderate this relationship. The first hypothesis stated that leader mindfulness is positively related to follower mindfulness. Second, it was proposed that this association is augmented by higher quality LMX relationships. The third and fourth hypotheses proposed that leader mindfulness will indirectly influence follower performance and subjective well-being through increased follower mindfulness and that this relationship will be moderated by LMX. The hypotheses were tested using a matched sample of supervisors and subordinates working in a Canadian public sector organization.

The study produced several interesting empirical findings. First, there was no significant overall effect of leader mindfulness on follower mindfulness (H1 not supported). Second, there was a significant positive interaction between leader mindfulness and group LMX, indicating that high levels of leader mindfulness can facilitate mindfulness among followers, but only when group members perceive their LMX relationships to be of high quality (H2 supported). The significant interaction effect was not reproduced at the within-group level or when using supervisor ratings of LMX. Surprisingly, the interaction suggested that the combination of high leader mindfulness and low LMX was detrimental to mindfulness among followers. Finally, the conditional effect of leader mindfulness on follower mindfulness had a positive indirect effect on follower subjective well-being (H4 supported), but no effect on in-role performance (H3 not supported). In what follows I will elaborate on these findings and discuss their theoretical and practical implications.

A primary purpose of this research was to investigate whether a leader's mindfulness "spills over" in a way that promotes mindfulness among followers. The results of Hypothesis 1 suggest that this is not the case overall, as there was no significant direct effect of leader mindfulness on follower mindfulness. A possible explanation for this null finding is that the social-psychological mechanisms that were proposed to influence follower mindfulness are, on average, not powerful enough or do not take place frequently enough to induce observable changes in dispositional mindfulness among followers. Although research supports the idea that leaders can have an inordinate impact on followers via forces such as social learning and emotional contagion (Bandura, 1986; Sy et al. 2005), followers may be subject to the same forces in other relationships occurring both inside and outside of work, each with varying degrees of interpersonal salience. These competing stimuli may dampen the impact of a leader's mindfulness to the degree that it will not have a lasting, observable effect on the follower's mindfulness. By contrast, mechanisms

that were found to be important in prior studies on mindfulness antecedents may be more potent or ubiquitous for employees. For example, mindfulness training programs that increase dispositional mindfulness are typically highly structured and intensive interventions that integrate mindfulness into the participant's daily life, including extended periods of meditation, homework exercises, and day-long mindfulness retreats (Bartlett et al., 2019). Whereas the theorized interpersonal pressures from leaders would typically be sporadic and inexplicit, mindfulness training programs elicit higher levels of dispositional mindfulness via heightened and frequent mindfulness states throughout a prolonged period of intensive mindfulness practice (Kiken et al., 2015). Similarly, aspects of work life that have been shown to influence employee mindfulness such as job design (e.g., Lawrie et al., 2018) and organizational climate (e.g., Reb et al., 2015) may be more integral to a typical follower's daily experience and functioning compared to periodic interpersonal pressures from their leader and could thus play a greater role in evoking mindfulness states and dispositional mindfulness change over time.

A more nuanced explanation for the null finding is that leader mindfulness “spills over” to follower mindfulness in some groups, but not in others. The second purpose of this research was to examine the interpersonal conditions that can strengthen the effect of leader mindfulness on follower mindfulness, namely the quality of LMX relationships. While there was no overall association between leader and follower mindfulness, the results from the test of Hypothesis 2 supported the idea that higher leader mindfulness can promote mindfulness among followers when group members perceive their LMX relationships to be of high quality. This finding offers empirical support for the theoretical argument that high LMX can bolster the influence of leader mindfulness by increasing the salience of leader-follower relationships for followers and prompting them to view leaders as more prototypical and influential targets for role-modeling

mindfulness. Integrating the results of Hypothesis 1 and 2, leader mindfulness cannot by itself elicit heightened follower mindfulness in workgroups with low or average levels of LMX, but it can have a positive impact when workgroup members are in high-quality LMX relationships.

Perhaps surprisingly, the pattern of the interaction effect found in this study suggests that leader mindfulness can also have a recoil effect when LMX is low, such that mindfulness among followers will be relatively low when they are in low-quality relationships with mindful leaders. While it is not clear based on my initial theorizing why this would be the case, two possible explanations stand out. First, some features of leader mindfulness may give rise to conditions that are not conducive to follower mindfulness when LMX is low. For example, mindfulness is associated with a non-reactive and “decentered” stance toward experience (Bishop et al., 2004). Research has also indicated that mindfulness practice can lead to increased self-centrality and self-enhancement bias (Jochen et al., 2018). When LMX is low, it is possible that followers could perceive these features of leader mindfulness as an attitude of interpersonal and emotional detachment. Due to lower levels of trust and familiarity, they may feel they are being given the “cold shoulder” when leaders do not reciprocate strong emotional responses, such as frustration with clients or organizational policies. Followers may be left feeling unacknowledged, causing them to harbor frustrations, and ruminate over why their leader does not appear to be concerned with their grievances or invested in improving their relationships. These negative emotional states and thought patterns might in turn lead to reduced levels of follower mindfulness. A second possible explanation is that followers in low LMX relationships with mindful leaders may take negative cues from their leader, adopting the opposite types of behaviors and attitudes at work. With low levels of liking and respect, followers could view the leader’s mindfulness as a model for unsuccessful workplace behavior, leading them to develop contrary attitudes, habits, and

working styles that could be detrimental to mindfulness. Future research could shed light on whether these explanations can account for the apparent recoil effect of leader mindfulness under conditions of low LMX.

These interpretations of the observed interaction effect in Hypothesis 2 are consistent with the null results that emerged when replacing follower LMX ratings with supervisor-rated LMX. Despite reasonable levels of agreement between leaders and followers in their perceptions of LMX quality, the leader's perception had no bearing on the relationship between leader and follower mindfulness. This finding is not surprising, as it is logical that the follower's perceptions would be more influential with respect to their own dispositional development. Whether or not leaders are viewed as prototypical group members and models for successful workplace behavior should depend primarily on followers' LMX perceptions. Further, the lack of a significant within-group interaction indicates that followers who have higher LMX relative to their workgroup peers do not benefit to a greater extent from their leader's mindfulness in terms of their own mindfulness. This finding is consistent with the social identity theory of leadership (Hogg 2001; Hogg & van Knippenberg, 2003), which predicts that leaders are endowed with prototypical group member status via depersonalized, consensus-based processes. From this perspective, group-level LMX is more relevant for perceived leader-group prototypicality because these perceptions are contingent upon shared, group-based attributions. The results support the idea that followers will be more likely to view leaders as suitable targets for shaping group social identities and normative behaviors if workgroup peers share their positive LMX perceptions, which could signal that the leader represents a prototype for successful behavior when building relationships and collaborating with the group overall.

Hypotheses 3 and 4 proposed that the conditional effect of leader mindfulness on follower mindfulness could lead to increases in follower in-role performance and subjective well-being. With respect to subjective well-being, the results of linear regression showed that mindfulness had a strong positive effect. Further, WABA indicated that the significant positive relationship occurs both at both the within- and between-group levels. Followers who were relatively higher in mindfulness compared to their workgroup peers also rated themselves relatively higher in terms of subjective well-being, and groups with higher average levels of mindfulness were higher in terms of average levels of subjective well-being. Although WABA I etas and ICC1 indicated somewhat low levels of group clustering for mindfulness, the strong group-level covariance between mindfulness and subjective well-being contributed significantly to the overall relationship, even after weighting by the etas. While much of the organizational research on mindfulness has focused on individual-level outcomes, these findings suggest that the benefits of mindfulness for employee well-being can also take effect at the level of the group. Tests for moderated mediation indicated that the conditional indirect effect of leader mindfulness on subjective well-being through follower mindfulness was more strongly positive when group-level LMX was high compared to when it was low, providing support for Hypothesis 4. Consistent with the pattern of the interaction found in Hypothesis 2, the conditional indirect effect was positive at high levels of group LMX and became strongly negative as LMX decreased further below the mean. Both the strength and direction of the conditional indirect effect of leader mindfulness depended on LMX; although leader mindfulness facilitated follower subjective well-being via follower mindfulness when group-level LMX was high, the conditional indirect effect was negative when LMX was low. These results speak to the critical role played by the quality of LMX

relationships in determining whether high levels of leader mindfulness led to desirable or undesirable outcomes for followers.

With respect to in-role performance, regression modelling indicated no significant association with follower mindfulness, and no association emerged at either within- or between-group levels of analysis when broken down via WABA procedures. This null finding contrasts with prior studies that demonstrated a positive association between mindfulness and performance (e.g., Mesmer-Magnus et al., 2017). This discrepancy might be explained by differences in the specific measures employed and in the contexts of the studies. At the time of this study, I could not locate any studies that tested this relationship using the same measures of mindfulness and performance as the current investigation. Some have tested the relationship between mindfulness and performance using the same measure of mindfulness (MAAS; Brown & Ryan, 2003) but employed different measures of performance (e.g., Beach et al., 2013; King & Haar, 2017). Zhang et al. (2013) used the Williams and Anderson (1991) scale to capture task performance but used a 2-dimensional reduced version of the Freiburg Mindfulness Inventory to capture mindfulness (Walach et al., 2006). It is possible that the positive association only holds for certain conceptualizations of mindfulness and in-role performance.

Moreover, the current study had a unique context distinct from prior research, in that it involved staff working in a remote setting. Perhaps mindfulness is not as important for performance when working from home because fewer cognitive resources are required to engage in self-regulating behaviors or to overcome distractions from colleagues. However, since it is reasonable to assume that work-from-home conditions varied considerably across different employees based on living situation, the explanation is likely more complex than that. An alternative possibility is that it is more difficult for supervisors to detect the impact of mindfulness

on performance because they cannot monitor subordinates as easily when working from home, especially if systems for remote performance monitoring have not been implemented. Although the precise reason for the null result cannot be established with the data collected in this study, these findings suggest that the connection between mindfulness and performance may not be universal, lending support for contingency frameworks for understanding this relationship, such as the one proposed by Dane (2011). While the context of this study limits its direct comparability to prior research on mindfulness and performance, it represents a useful contribution by examining this relationship in a novel workplace setting.

Practical Implications

This research makes two important practical contributions. First, as organizations invest more resources into workplace mindfulness training, they serve to benefit from a more complete understanding of the range of mechanisms that can nurture or deter employee mindfulness. Second, more knowledge regarding the benefits of leader mindfulness may help to inform organizational efforts to promote and reward mindfulness as a positive attribute of leaders. As noted by Hülsheger (2015), and as evidenced by recent empirical studies on antecedents of employee mindfulness (e.g., Lawrie et al., 2018; Reina & Kudesia, 2020), greater investment in mindfulness training programs may not be the only way to promote mindfulness in organizations. The results of this study indicate that employees can benefit from enhanced mindfulness and subjective well-being when they are in high-quality relationships with more mindful leaders. For leaders, this implies that a focus on personal mindfulness development should be paired with a close attention to the development of high-quality relationships with subordinates to maximize the interpersonal benefits of mindfulness for their workgroups. Importantly, a leader's focus on personal mindfulness development should not come at the expense of time and resources that are put toward nurturing relationships with

followers, as this may lead to worse outcomes in terms of follower mindfulness and well-being. Furthermore, the results suggest that mindful leaders should focus on developing high-quality relationships with all followers as opposed to particular followers within their teams because the benefits for follower mindfulness and subjective well-being will not take effect for particular favored group members.

For organizations, if decision-makers are considering dedicating greater resources toward mindfulness development among leaders, they should consider coupling these efforts with investments in training or activities that promote improved relationships between leaders and their teams. The findings from this study suggest that such an approach could facilitate a “trickling down” of leader mindfulness to followers, thereby enhancing mindfulness and subjective well-being at multiple levels of the organization. Considering the null finding with respect to mindfulness and in-role performance, if the primary goal of mindfulness development is to facilitate better employee performance, organizational decision makers should take care to identify the specific performance behaviors that are being targeted and determine whether mindfulness is an effective mechanism for driving those behaviors within the focal workplace context.

Contribution to Scholarship

By exploring the nature of the relationship between leader and follower mindfulness, this study makes two primary contributions to management scholarship. First, it expands on the burgeoning line of organizational research on the consequences of leader mindfulness for subordinates by investigating an outcome that has received little attention in this literature: follower mindfulness. Second, it builds on extant research on the antecedents of mindfulness in the workplace by examining the role of leader mindfulness and leader-follower relationships in facilitating employee mindfulness. Prior studies have demonstrated the benefits of leader

mindfulness for followers in terms of their performance (e.g., Schuh et al., 2019) and well-being (e.g., Reb et al., 2014), and researchers have drawn upon related leadership styles and behaviors such as transformational leadership (Carleton et al., 2018; Pinck & Sonnentag, 2018) and procedural justice enactment (Schuh et al., 2019) to understand the positive effects of leader mindfulness. Expanding on these findings, the results of this study suggest an alternative way that mindful leaders can improve follower well-being – by nurturing high-quality leader-follower relationships and facilitating higher levels of mindfulness among followers.

In addition, these results depart from prior findings by suggesting that leader mindfulness may not always have positive consequences for followers, as it was associated with reduced follower mindfulness and well-being when leader-follower relationships were neglected. This result builds on recently published findings suggesting that mindfulness may not always be desirable in the context of leader-follower relationships. For example, increased follower mindfulness has been shown to worsen the negative effects of abusive supervision on follower psychological well-being (Walsh & Arnold, 2020) and fairness perceptions (Burton & Barber, 2019). While much of the research on mindfulness has focused on its benefits, this study provides further support for the idea that mindfulness is not necessarily beneficial in all circumstances by showing that leader mindfulness can lead to worse outcomes when LMX is low. More broadly, these findings contribute to a wider understanding of the interpersonal outcomes of leader mindfulness, the moderating conditions that govern the effects of leader mindfulness, and the mechanisms that explain how mindful leaders can support follower well-being.

In terms of organizational research on the antecedents of employee mindfulness, previous studies have examined the role played by workplace experiences in facilitating mindfulness such as mindfulness training (for a meta-analysis, see Bartlett et al., 2019), job design (Lawrie et al.,

2018), and task characteristics (Reina & Kudesia, 2020). The current study broadens the scope of this line of research to consider the interpersonal antecedents of employee mindfulness in the context of leader-follower relationships. The results of this investigation provide support for the idea that leader mindfulness can function as an antecedent to follower mindfulness, but only when followers are in high-quality relationships with their leaders. They also build on research exploring hindrances to mindfulness at work by showing that leader mindfulness can be a negative antecedent to follower mindfulness when followers perceive their LMX relationship to be low-quality. In exploring these relationships, the study answers the call to investigate whether leaders can facilitate follower mindfulness (Hulsheger, 2015), and delves further into this research question by examining the interpersonal conditions that play an important moderating role. By providing a theoretical basis for the role played by leaders and LMX relationships in promoting follower mindfulness and testing these predictions in a real-world workplace setting, this study helps lay the groundwork for a multi-level, well-rounded approach to research on mindfulness antecedents within organizations.

Another contribution of this research is related to the possible theoretical implications of the findings. The theorizing in this study argues that LMX can strengthen the relationship between leader mindfulness and follower mindfulness because followers with high-quality leader-follower relationships will view their leaders as more salient targets for social and professional identity development, in accordance with social identity theory (Turner & Tajfel, 1986) and Ibarra's framework for employee socialization (1999). While there was no relationship between leader mindfulness and follower mindfulness for groups with average levels of LMX, the significant positive interaction between leader mindfulness and group LMX supports the idea that LMX can enhance the salience and impact of the cues sent by leaders, such that the leader's mindfulness is

more easily diffused among workgroup members. The observed recoil effect showing low levels of follower mindfulness when followers were in low-quality relationships with mindful leaders suggests the theoretical possibility that leaders can send negative cues to followers when they are viewed as non-prototypical group members or as models of unsuccessful workplace identities, with followers picking up on contrary behaviours and attitudes. If this explanation is correct, one might expect to find the same pattern of follower emulation or recoil when it comes to other leader characteristics and behaviors. For instance, perhaps more ethical or authentic styles of leadership translate to increased or decreased follower ethicality/authenticity depending on the relationship quality between leaders and followers. If similar results are not found with respect to other leader characteristics, it may be the case that there is something unique to leader mindfulness that causes followers to emulate or recoil from mindfulness depending on the group's LMX, as was considered in the discussion. While this study does not make any strong theoretical conclusions, its findings may be relevant to broader theoretical efforts to understand the dynamics affecting patterns of follower-leader emulation.

Future Directions

Future studies could explore the mechanisms that can explain the relationship between leader and follower mindfulness and the moderating role of LMX. Employing multidimensional measures of mindfulness such as the FFMQ (Baer et al., 2006) or CHIME (Bergomi et al., 2013) could help to clarify whether particular features that have been associated with mindfulness like non-judging or non-reactivity are more or less susceptible to mindfulness contagion. Since a theoretical framework grounded in social learning theory suggests that mindfulness can be learned via imitation of observable behavioral manifestations of mindfulness, it would be beneficial to identify which expressions of leader mindfulness may be subject to follower emulation. Likewise,

instead of using a global measure of LMX quality, future research could examine whether particular dimensions of relationships such as liking or frequency of leader-follower interaction play a key role in strengthening the interpersonal effects of leader mindfulness. While the LMX-MDM 12 scale (Liden & Maslyn, 1998) has been widely validated as a psychometrically sound measure of LMX and corresponds to the theoretical framework in this study, Gottfredson et al. (2020) have questioned whether this measure primarily captures perceptions of one's dyadic partner rather than the quality of exchange. Examining more specific aspects of LMX could help to address questions about conceptual ambiguity and would also facilitate a clearer understanding of why high-quality LMX enables mindful leaders to improve follower mindfulness, which could help organizations to identify and promote these specific aspects of leader-follower relationships. Future research could also explore whether other influential dyadic- and group-level dynamics of LMX play a role in facilitating or hindering follower mindfulness, such as LMX dyadic dispersion or LMX group differentiation. Additionally, the theorizing in this research points to some specific mechanisms that warrant further investigation, such as follower susceptibility to emotional contagion and follower perceptions of leader-group prototypicality.

Further studies could help to establish the generalizability of these results by testing the hypotheses in a variety of other organizational settings. In particular, it would be valuable to examine the possible impact of the COVID-19 pandemic on generalizability by collecting additional data when the broader social circumstances have stabilized and from dyads who share the same physical work environment. In addition to demonstrating generalizability, studies could also use different methodological approaches that would help to establish causality. For example, the time order of occurrence condition for causality could be established using a time-lagged design whereby leader mindfulness is measured several months in advance of follower

mindfulness. Experimental designs could also help to demonstrate causal priority. For instance, it could be tested whether leader participation in a mindfulness training program leads to a subsequent increase in follower mindfulness. A more controlled experimental design could involve measuring state mindfulness of leaders and followers before and after specific interactions to see whether there is an immediate contagion effect on moment-to-moment experiences of mindfulness.

Future research could also investigate the reasons for the unexpected finding that high leader mindfulness and low LMX can lead to worse outcomes for followers. Is it the case, for example, that followers in low-quality relationships with mindful leaders perceive these leaders as being more interpersonally detached and disengaged, as was contemplated in the above discussion? In terms of future studies that can expand on interpersonal antecedents of mindfulness, researchers might examine the role played by a variety of workplace relationships in facilitating employee mindfulness, such as those with close peers or mentors. Employees may experience multiple relationships in the workplace that influence their attitudes, behaviors, emotions, and identities. Thus, future research on a broader range of influential relationships may contribute to a greater understanding of antecedents of mindfulness in the workplace.

Limitations

This study employed a number of trait and attitudinal self-report measures (mindfulness, LMX, subjective well-being), introducing the threat of measurement error due to common method variance. Such errors can call into question the validity of findings regarding the relationships between constructs (Podsakoff et al., 2003). Although it would not be possible to completely eliminate this issue, the study employed several procedural and statistical precautions to reduce the threat of common method bias. In terms of procedural precautions, the dyadic design of this

study involved collecting data on key constructs from multiple sources. Specifically, leaders and followers rated their own mindfulness, and both leaders and followers were asked to rate LMX. Additionally, follower performance was measured using an alternate rater, with leaders providing data on this construct. Attitudinal measures such as mindfulness and subjective well-being are less conducive for measuring via alternate raters because they require highly personal knowledge in terms of psychological experience. To reduce the threat of dishonest responding, participants were reminded throughout the survey to respond honestly, that there are no right or wrong answers, and that all responses will remain confidential. The questionnaire also employed a variety of scale labels and endpoints to reduce method bias. As regards statistical procedures, confirmatory factor analysis provided evidence for the discriminant validity of study variables. Additionally, data were collected on participants' mood via the positive and negative affect scale (Thompson, 2007) to remove potentially biasing effects caused by the participant's frame of mind while completing the questionnaire. This approach provided confidence that participant mood states did not impact the results.

An additional limitation is that causality cannot be established due to the cross-sectional design. While the theorizing presented in this paper suggests causal relationships, measuring constructs at one point in time does not establish the time order of occurrence condition for causality. As reverse causality cannot be discounted, a tall claim of causality is not made in this research. In the future, an experimental or longitudinal study should be conducted to demonstrate that the causal predictor occurs before or simultaneously with the outcome.

A third limitation of the study is related to questionnaire length. This study strikes a balance between the amount of data that is required to answer its research questions and the number of survey items that can be answered thoughtfully and without inducing participant fatigue. While

this approach helps ensure valid measurement (Galesic & Bosnjak, 2009), its downside is that additional items that may offer useful insights cannot be collected until a later point in time. For example, facet-based mindfulness measures such as the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) might provide insight into whether specific components of mindfulness are driving these outcomes. Unfortunately, the FFMQ is prohibitively long (37 items) given the number of items that were already included in the leader and follower surveys in this study. To address this limitation, future investigations might examine subsets of this study's predictions at the facet level using multi-dimensional measures such as the FFMQ.

Finally, the generalizability of this study may be limited in terms of its context. Because the predictions of this study were tested using data from within a particular organizational context – unionized public sector administrative staff working remotely – it is possible that the results do not generalize to non-unionized private sector employers, or to organizations in which leaders and followers work in a shared physical workplace setting. As argued by Dienesch & Liden (1986), LMX development may follow different processes in unionized environments because some forms of differentiation between subordinates could be seen as a violation of the collective agreement.

The dynamics of leader-follower relationships may also differ in a remote work setting due to changes in the frequency and mode of supervisor-subordinate interactions. This contrast was illustrated by a recent *Nature* publication indicating that Microsoft's transition to remote work during the COVID-19 pandemic led to a decrease in synchronous forms of communication and an increase in asynchronous communication modes (Yang et al., 2021). The idea that such disruptions to communications can affect supervisor-subordinate dynamics is bolstered by results from the work-from-home data collected as part of this study (see Appendix C), which indicate that both

the frequency and mode of leader-follower interactions in the remote setting have important implications for follower perceptions of LMX and leader performance.

Beyond the direct organizational environment, the study was also conducted within a western Canadian context, so it cannot be determined whether the findings generalize to other cultural settings across the globe. In particular, the role played by leader-follower relationships in the current context may differ in countries oriented more strongly toward collectivism, as this cultural dimension has been shown to strongly influence how LMX relates to several key employee outcomes (for a meta-analysis, see Rockstuhl et al., 2012). In the future, these limitations can be addressed by testing the predictions on a wider variety of organizational and cultural settings.

Conclusion

This study has provided a theoretical basis for understanding how mindful leaders can facilitate higher levels of mindfulness among their followers. It proposed four specific hypotheses regarding the nature of the relationship between leader and follower mindfulness and its consequences for follower subjective well-being and in-role performance. These hypotheses were tested in a dyadic sample of supervisors and subordinates working in the Canadian public sector. The results suggest that when it comes to follower mindfulness, leader mindfulness can be a double-edged sword. Whereas leader mindfulness did not predict higher follower mindfulness overall, it had a significant positive interaction with group-level LMX, such that it predicted higher follower mindfulness when group members reported high-quality relationships with their leader. When LMX was low, however, leader mindfulness was associated with reduced follower mindfulness. Moderated mediation analysis revealed that the conditional indirect effect of leader mindfulness on follower subjective well-being through follower mindfulness was more strongly positive at high versus low LMX. No such effects were found for follower in-role performance. In

conclusion, this study provides support for the idea that mindful leaders should pay close attention to the quality of their LMX relationships, as they play an important role in determining whether followers will benefit with respect to their own mindfulness and subjective well-being. Future research should investigate the causal mechanisms that could explain this LMX contingency and explore other workplace relationships that may play a role in employee mindfulness development.

TABLES

Table 1

Summary of Dispositional Mindfulness Workplace Outcomes

Mindfulness outcome	Study	Result
In-role performance	Dane & Brummel, 2014 Reb et al., 2015 King & Haar, 2017 Mesmer-Magnus et al., 2017	Positive ($r = .23^*$) Positive ($r = .20^*$) Positive ($r = .31^{**}$) Positive ($\rho = .34$)
Organizational citizenship behaviors	Reb et al., 2015 Cameron & Fredrickson, 2015 Berry et al., 2018	Positive ($r = .32^{**}$) Positive ($\beta = .57^{**}$) Positive ($r = .34^{**}$)
Counterproductive work behaviors	Reb et al., 2015 Krishnakumar and Robinson, 2015 Long & Christian, 2015	Negative ($r = -.30^{**}$) Negative ($r = -.36^{**}$) Negative ($r = -.46^{**}$)
Emotional exhaustion	Hülshager et al., 2013 Taylor & Milllear, 2016 Charoensukmongko, 2016 Reb et al., 2017 Li et al., 2017	Negative ($r = -.49^{**}$) Negative ($r = -.29^{**}$) Negative ($r = -.41^{**}$) Negative ($r = -.37^{**}$) Negative ($r = -.32^{**}$)
Job satisfaction	Andrews et al., 2014 Zivnuska et al., 2015 Reb et al., 2015	Positive ($r = .28^{**}$) Positive ($r = .24^{**}$) Positive ($r = .46^{**}$)
Job engagement	Leroy et al., 2013 Zivnuska et al., 2015 Malinowski & Lim, 2015 Tuckey et al., 2018	Positive ($r = .32^{**}$) Positive ($r = .44^{**}$) Positive ($r = .27^{**}$) Positive ($r = .41^{**}$)

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

Table 2

Confirmatory Factor Analysis Model Comparisons

Models with LMX, Mindfulness, Performance, Subjective Well-being	χ^2	df	$\Delta\chi^2(df)$	TLI	CFI	RMSEA	SRMR
Model 1: 1-factor model (all variables constrained to one factor)	1923.33	405	1285.06(6)***	0.33	0.37	0.18	0.26
Model 2: 3-factor model (mindfulness and LMX constrained to one factor)	876.90	402	238.63(3)***	0.79	0.80	0.10	0.11
Model 3: 3-factor model (performance and LMX constrained to one factor)	856.14	402	217.87(3)***	0.80	0.81	0.10	0.10
Model 4: 3-factor model (mindfulness and subjective well-being constrained to one factor)	842.15	402	203.88(3)***	0.80	0.82	0.10	0.09
Model 5: Full 4-factor model	638.27	399		0.89	0.90	0.07	0.07

Note. LMX = Leader-Member Exchange, TLI = Tucker-Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual.

*** $p < .001$.

Table 3

Means, Standard deviations, and Correlations for Leader Survey

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Mindfulness	4.20	0.72					
2. Subjective Well-being	3.91	0.93	.71***				
3. Positive Affect	3.36	0.69	.36**	.53***			
4. Negative Affect	1.85	0.70	-.53***	-.70***	-.38**		
5. Sex (female)	0.34	0.48	-.42**	-.38**	-.07	.26	
6. Age	47.50	8.69	.02	.09	-.11	-.13	-.18

Note. *N* = 58 leaders. *M* and *SD* represent mean and standard deviation, respectively.
 p* < .01. *p* < .001.

Table 4

Means, Standard deviations, and Correlations for Follower Survey

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Mindfulness	4.46	0.81								
2. LMX	5.55	1.06	-.03							
3. SLMX	5.82	0.79	-.03	.27**						
4. Performance	6.19	0.92	-.04	.28**	.78***					
5. Subjective Well-being	4.14	0.95	.59***	.11	-.05	-.07				
6. Positive Affect	3.24	0.70	.44***	.26***	.04	-.04	.68**			
7. Negative Affect	1.88	0.82	-.50***	-.07	.03	-.00	-.77***	-.46***		
8. Sex (female)	0.57	0.50	-.08	-.03	.09	.16	-.10	-.09	.07	
9. Age	42.77	11.47	.33***	-.17*	-.07	-.11	.33***	.19*	-.30***	-.08

Note. *N* = 183 followers. *N* = 121 for correlations with Performance and Supervisor LMX. *M* and *SD* represent mean and standard deviation, respectively. SLMX = Supervisor LMX.
 * *p* < .05. ***p* < .01. ****p* < .001.

Table 5

Hierarchical Linear Models for Follower Mindfulness

Variable	Dependent variable: Follower Mindfulness					
	Model 1 (H1)			Model 2 (H2)		
	Coefficient	S.E.	Standardized Coefficient	Coefficient	S.E.	Standardized Coefficient
Intercept	4.32***	0.09		4.31***	0.10	
Positive Affect	0.33***	0.09	0.28	0.35***	0.10	0.30
Negative Affect	-0.38***	0.09	-0.35	-0.37***	0.09	-0.35
Age	0.11	0.06	0.15	0.15*	0.06	0.21
Sex (female)	0.06	0.12	0.03	0.20	0.13	0.13
Leader Mindfulness	-0.03	0.10	-0.02	0.01	0.10	0.001
LMX (group level)				0.18	0.11	0.15
Leader Mindfulness * LMX (group level)				0.40*	0.16	0.21
Δ Pseudo R^2 (adding last predictor)		0.001			0.036*	

Note. For Model 1, $N = 124$, 37 groups. For Model 2, $N = 104$, 31 groups. LMX = leader-member exchange; S.E. = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6

Multivariate Regression for Mindfulness and Subjective Well-being

Variable	Dependent Variable: Subjective Well-being								
	(Model 1)		(Model 2)		(Model 3)				
	Coefficient	95% C.I.	Standardized Coefficient	Coefficient	95% C.I.	Standardized Coefficient			
Intercept	4.09***	[4.02, 4.16]		4.13***	[4.03, 4.23]		4.12***	[4.03, 4.22]	
Positive Affect	0.52***	[0.41, 0.63]	0.38	0.52***	[0.41, 0.63]	0.38	0.45***	[0.34, 0.55]	0.33
Negative Affect	-0.70***	[-0.80, -0.60]	-0.58	-0.68***	[-0.78, -0.58]	-0.57	-0.57***	[-0.67, -0.48]	-0.48
Age				0.03	[-0.03, 0.10]	0.04	0.01	[-0.05, 0.07]	0.01
Sex (female)				0.08	[-0.22, 0.06]	-0.04	-0.06	[-0.19, 0.07]	-0.03
Mindfulness							0.30***	[0.20, 0.39]	0.25
Observations		237			235			235	
R ²		0.68			0.69			0.73	
Adjusted R ²		0.68			0.68			0.73	
Residual Std. Err.		0.54 (df = 234)			0.54 (df = 230)			0.50 (df = 229)	
F Statistic		248.26*** (df = 2; 234)			127.53*** (df = 4; 230)			125.37*** (df = 5; 229)	

Note. C.I. = 95% confidence interval. ***p < .001.

Table 7

Multivariate Regression for Mindfulness and In-role Performance

Variable	Dependent Variable: In-role Performance						
	(Model 1)		(Model 2)		(Model 3)		
	Coefficient	95% C.I.	Standardized Coefficient	Coefficient	95% C.I.	Standardized Coefficient	
Intercept	6.18***	[6.03, 6.34]		6.00***	[5.76, 6.24]	6.00***	[5.76, 6.24]
Positive Affect	0.04	[-0.20, 0.28]	0.03	0.07	[-0.17, 0.30]	0.07	[-0.18, 0.33]
Negative Affect	0.03	[-0.19, 0.24]	0.02	-0.03	[-0.25, 0.19]	-0.04	[-0.27, 0.19]
Age				-0.11	[-0.25, 0.03]	-0.11	[-0.25, 0.03]
Sex (female)				0.33*	[0.01, 0.65]	0.33*	[0.01, 0.65]
Mindfulness						-0.02	[-0.25, 0.22]
Observations		139			137		137
R ²		0.001			0.05		0.05
Adjusted R ²		-0.01			0.02		0.02
Residual Std. Err.		0.94 (df = 136)			0.92 (df = 132)		0.93 (df = 131)
F Statistic		.06 (df = 2; 136)			1.79 (df = 4; 132)		1.43 (df = 5; 131)

Note. C.I. = 95% confidence interval. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 8

Within and Between Analysis for Mindfulness and Subjective Well-being

Total Correlation (person level)	0.60***††	
Between-group model		
Between-group correlation (r_{BXY})	0.71***††	
Between-group variation		
Mindfulness (η_{BX})	0.59	
Subjective Well-being (η_{BY})	0.61	
Between-group component ($r_{BXY})(\eta_{BX})(\eta_{BY})$	0.25	
Within-Group Model		
Within-group correlation (r_{WXY})	0.54***††	
Within-group variation		
Mindfulness (η_{WX})	0.81	
Subjective Well-being (η_{WY})	0.79	
Within-group component ($r_{WXY})(\eta_{WX})(\eta_{WY})$	0.35	
		Induction
Differences		
Mindfulness		
Between variation versus within variation		
<i>E</i> ratio = η_{BX}/η_{WX}	0.72†	Weak within
<i>F</i> ratio = $(1/E^2)(J-1)/(N-J)$	0.81	Equivocal (both)
Subjective Well-being		
Between variation versus within variation		
<i>E</i> ratio = η_{BY}/η_{WY}	0.77	Equivocal (both)
<i>F</i> ratio = $(1/E^2)(J-1)/(N-J)$	0.71	Equivocal (both)
Differences		
Between correlation versus within correlation		
<i>A</i> test	0.22	Equivocal (both)
<i>Z</i> test	1.45	Equivocal (both)
Between component versus within component (weighted correlations)		
<i>A</i> test	-0.10	Equivocal (both)
<i>Z</i> test	-0.52	Equivocal (both)
Overall Induction		Equivocal (both)

Note. $N = 135$, $J = 41$ groups. † $\theta^{\circ} > 15^{\circ}$. †† $\theta^{\circ} > 30^{\circ}$. *** $p < .001$.

Table 9

Moderated Mediation Models

Conditional indirect effects of leader mindfulness on follower subjective well-being through follower mindfulness at $M \pm 1, 2$ SD of LMX			
	Effect	LLCI	ULCI
-2 SD LMX	-0.36*	-0.69	-0.06
-1 SD LMX	-0.17 ⁺	-0.37	0.01
$M(0)$	0.002	-0.14	0.14
+1 SD LMX	0.19 ⁺	-0.02	0.41
+2 SD LMX	0.37*	0.04	0.73

Marginal LMX effects			
	Effect	LLCI	ULCI
-1 SD Leader Mindfulness	-0.08	-0.23	0.07
+1 SD Leader Mindfulness	0.32*	0.05	0.60

Note. $N = 104$, 31 groups. LMX = leader-member exchange; LLCI = Lower limit 95% confidence interval; ULCI = Upper limit 95% confidence interval. Effects control for positive affect, negative affect, age, and sex.

⁺ $p < .10$; * $p < .05$.

Table 10

Summary of Results

Hypothesis	Result
H1: <i>Leader mindfulness is positively related to follower mindfulness.</i>	Not supported
H2: <i>Follower perceptions of LMX moderate the relationship between leader mindfulness and follower mindfulness at the group level, such that the relationship is stronger when LMX quality is high compared to when it is low.</i>	Supported
H3: <i>Follower mindfulness mediates the positive indirect effect of leader mindfulness on follower in-role performance as moderated at the group level by follower LMX, such that the indirect effect of leader mindfulness on follower in-role performance is stronger when LMX quality is high compared to when it is low.</i>	Not supported
H4: <i>Follower mindfulness mediates the positive indirect effect of leader mindfulness on follower subjective well-being as moderated at the group level by follower LMX, such that the indirect effect of leader mindfulness on follower subjective well-being is stronger when LMX quality is high compared to when it is low.</i>	Supported

FIGURES

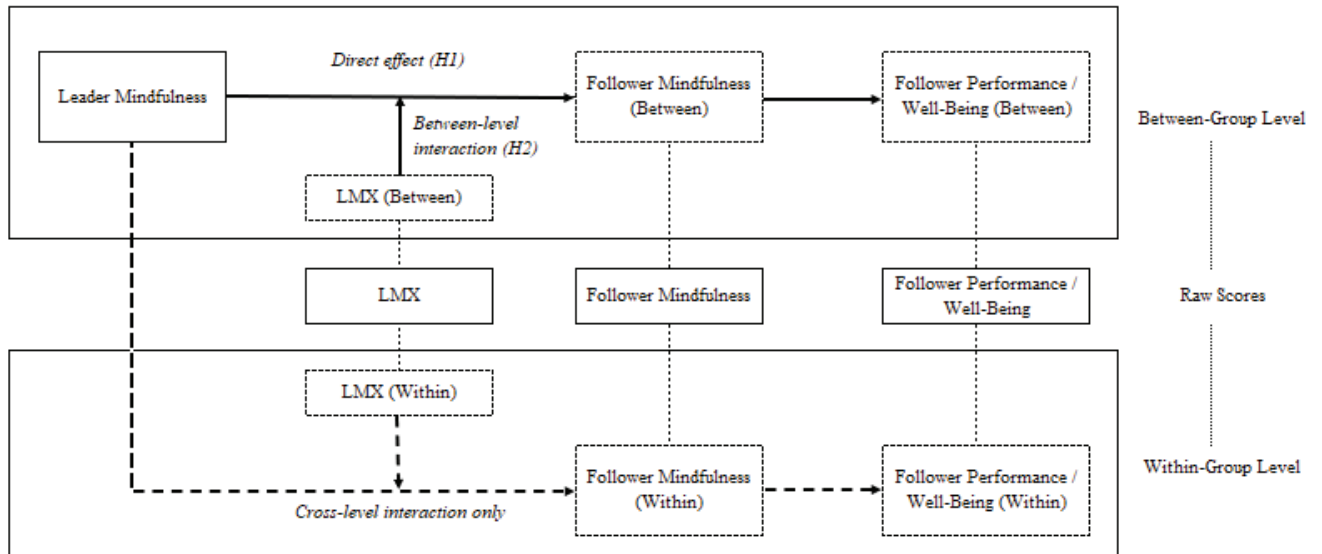


Figure 1. Unconflated Research Model

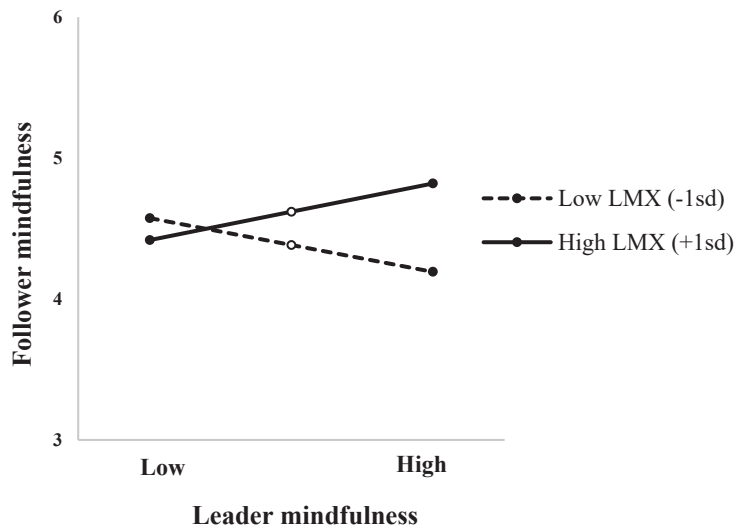


Figure 2. Group-level Interaction Plot of Leader Mindfulness and LMX

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APPENDIX A: INVITATION TO STUDY PARTICIPANTS


from human resources



Working from Home... we're partnering with the University of Lethbridge on a research project!

We're asking for 20 minutes of your time to complete a confidential survey about leadership and working remotely.


In support of the City's Work from Home initiative, we will be taking part in a University of Lethbridge research study looking into how supervisors and employees have been adapting to working from home.



The aim of this research is to explore effective practices to support the well-being and job performance of teams that are working remotely.

ATTENTION!

You will shortly be receiving an email invitation from Jasper Sonmor, a researcher at the University of Lethbridge. This is not spam or phishing!



This survey will look a bit different

Supervisors will receive a separate survey for each member of their team. This is called a matching survey. Don't worry - all responses are confidential and the data does not gather any identifiable information.

Supervisors will need to set aside a bit more time to complete the survey.

What happens with the data?

This study will help support the City's Work from Home initiative, and your participation will contribute to an important area of research right now.

The data is confidential. Your name and any other information you share will be safe guarded. The data presented to the People and Culture team at the City by the University of Lethbridge will not identify anyone. Only aggregate data will be shared.

APPENDIX B: MEASURES

Mindful Attention Awareness Scale (Brown & Ryan, 2003)

Instructions: Below is a collection of statements about your everyday experience. Using the scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what reflects your experience rather than what you think your experience should be.

Almost *Very* *Somewhat* *Somewhat* *Very* *Almost*
Always *Frequently* *Frequently* *Infrequently* *Infrequently* *Never*

1. I could be experiencing some emotion and not be conscious of it until some time later.
2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
3. I find it difficult to stay focused on what's happening in the present.
4. I tend to walk quickly to where I'm going without paying attention along the way.
5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
6. I forget a person's name almost as soon as I've been told it for the first time.
7. It seems I'm "running on automatic" without much awareness of what I'm doing.
8. I rush through activities without being really attentive to them.
9. I get so focused on the goal I want to achieve that I lost touch with what I am doing right now to get there.
10. I do jobs or tasks automatically, without being aware of what I'm doing.
11. I find myself listening to someone with one ear, doing something else at the same time.
12. I drive places on "automatic pilot" and then wonder why I went there.
13. I find myself preoccupied with the future or the past.
14. I find myself doing things without paying attention.
15. I snack without being aware that I'm eating.

LMX-MDM 12 (Liden & Maslyn, 1998)

Instructions: The following statements concern your perceptions about your supervisor. Please indicate the extent to which you agree or disagree with each statement:

Strongly Disagree *Disagree* *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree* *Strongly Agree*

Affect dimension

1. I like my supervisor very much as a person.
2. My supervisor is the kind of person one would like to have as a friend.
3. My supervisor is a lot of fun to work with.

Loyalty dimension

4. My supervisor defends my work actions to a superior, even without complete knowledge of the issue in question.
5. My supervisor would come to my defense if I were “attacked” by others.
6. My supervisor would defend me to others in the organization if I made an honest mistake.

Contribution dimension

7. I do work for my supervisor that goes beyond what is specified in my job description.
8. I am willing to apply extra efforts, beyond those normally required, to further the interests of my workgroup.
9. I do not mind working my hardest for my supervisor.

Professional Respect dimension

10. I am impressed with my supervisor 's knowledge of his/her job.
11. I respect my supervisor's knowledge of and competence on the job.
12. I admire my supervisor's professional skills.

SLMX-MDM (Greguras and Ford, 2006)

Instructions: The following statements concern your perceptions about your subordinate(s). Please indicate the extent to which you agree or disagree with each statement:

Strongly Disagree *Disagree* *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree* *Strongly Agree*

Affect dimension

1. I like my subordinate very much as a person.
2. My subordinate is the kind of person one would like to have as a friend.
3. My subordinate is a lot of fun to work with.

Loyalty dimension

4. My subordinate defends my decisions, even without complete knowledge of the issue in question.
5. My subordinate would come to my defense if I were “attacked” by others.
6. My subordinate would defend me to others in the organization if I made an honest mistake.

Contribution dimension

7. I provide support and resources for my subordinate that goes beyond what is specified in my job description.
8. I am willing to apply extra efforts, beyond those normally required, to help my subordinate meet his or her work goals.
9. I do not mind working my hardest for my subordinate.

Professional Respect dimension

10. I am impressed with my subordinate's knowledge of his/her job.
11. I respect my subordinate's knowledge of and competence on the job.
12. I admire my subordinate's professional skills.

In-role Performance (Williams & Anderson, 1991)

Instructions: The following statements concern your perceptions about your subordinate(s). Please indicate the extent to which you agree or disagree with each statement:

Strongly Disagree *Disagree* *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree* *Strongly Agree*

1. Adequately completes assigned duties.
2. Fulfills responsibilities specified in job description.
3. Performs tasks that are expected of him/her.
4. Meets formal performance requirements of the job.
5. Engages in activities that will directly improve his/her performance evaluation.
6. Neglects aspects of the job he/she is obligated to perform. (R)
7. Fails to perform essential duties. (R)

Psychological General Well-being Index (Grossi et al., 2006)

Instructions: This section contains questions about how you feel and how things have been going with you. For each question select the answer which best applies to you.

1. Have you been bothered by nervousness or your "nerves" during the past month?
 - 0 – Extremely so – to the point where I could not work or take care of things
 - 1 – Very much so
 - 2 – Quite a bit
 - 3 – Some – enough to bother me
 - 4 – a little
 - 5 – Not at all

2. How much energy, pep, or vitality did you have or feel during the past month? (R)
 - a. 5 – Very full of energy – lots of pep
 - b. 4 – Fairly energetic most of the time
 - c. 3 – My energy level varied quite a bit
 - d. 2 – Generally low in energy or pep
 - e. 1 – Very low in energy or pep most of the time
 - f. 0 – No energy or pep at all – I felt drained, sapped

3. I felt downhearted and blue during the past month. (R)
 - a. 5 – None of the time
 - b. 4 – A little of the time
 - c. 3 – Some of the time
 - d. 2 – A good bit of the time
 - e. 1 – Most of the time
 - f. 0 – All of the time

4. I was emotionally stable and sure of myself during the past month.
 - a. 0 – None of the time
 - b. 1 – A little of the time
 - c. 2 – Some of the time
 - d. 3 – A good bit of the time
 - e. 4 – Most of the time
 - f. 5 – All of the time

5. I felt cheerful, lighthearted during the past month.
- a. 0 – None of the time
 - b. 1 – A little of the time
 - c. 2 – Some of the time
 - d. 3 – A good bit of the time
 - e. 4 – Most of the time
 - f. 5 – All of the time
6. I felt tired, worn out, used up, or exhausted during the past month. (R)
- a. 5 – None of the time
 - b. 4 – A little of the time
 - c. 3 – Some of the time
 - d. 2 – A good bit of the time
 - e. 1 – Most of the time
 - f. 0 – All of the time

PANAS 10-item (Thompson, 2007)

Instructions: This section consists of a number of words that describe different feelings and emotions. Read each word and then indicate the extent that you have felt this way over the past couple of weeks, using the scale below the word.

*Very slightly, or
not at all* *A little* *Moderately* *Quite a bit* *Extremely*

Positive Affect

1. Determined
2. Alert
3. Inspired
4. Attentive
5. Active

Negative Affect

6. Upset
7. Hostile
8. Ashamed
9. Nervous
10. Afraid

APPENDIX C: ANALYSIS OF WORK-FROM-HOME DATA

Purpose:

To support the partner organization's Work-From-Home initiative, I examined the impact of the frequency and mode of remote leader-follower interactions on follower outcomes and perceptions of leader effectiveness. The transition from in-person to remote supervisor-subordinate relationships disrupts the established cadence and mode of interactions between leaders and followers. Accordingly, the analysis centered on the following research questions:

- 1) Does the overall frequency of leader-follower interactions predict key outcomes for leaders and followers in the remote work setting?
- 2) Controlling for the frequency of leader-follower interactions, how does the balance between synchronous and asynchronous interactions relate to these outcomes?
- 3) Do the effects of leader-follower interaction mode and frequency take place primarily at the within- or between-group level?

Measures:

Followers rated the frequency of various types of interactions over the preceding six months – synchronous (face-to-face / in-person, telephone, and zoom/video conference) and asynchronous (email, text, and direct online message). To obtain a total frequency of interaction, each response option was converted to a common measure of frequency (number per year), and the frequencies of all types were added. The resulting measure covered several orders of magnitude. A logarithmic transformation (after summing the different types of interaction) rendered a distribution more suited for input in linear models: “Log Total Interaction” in tables below.

The mix of synchronous versus asynchronous communications was operationalized with the ratio of frequency of synchronous interactions to total frequency of interactions (i.e., with neither quantity transformed by logarithm): “Sync-To-Total” in tables and figures below.

Outcomes selected for this analysis included four positive outcomes (all rated by followers): Leader Effectiveness (Yukl et al., 2013), Remote Leader Communication Quality (Kayworth & Leidner, 2002), Leader-Member Exchange (LMX; Liden & Maslyn, 1998), Perceived Social Support (Morgeson & Humphrey, 2006); and one negative outcome: Work-Family Conflict (Carlson et al., 2000). All measures demonstrated acceptable reliability ($\alpha > .80$).

Analytical Approach:

To test for nonlinear effects of the ratio Sync-To-Total, a polynomial regression model was employed. For each outcome variable, the synchronous-to-total ratio, and its squared term, was added to the model after including total interaction frequency (which was centered on its mean value). For models in which Sync-to-Total had a significant negative curvilinear effect, I located the peak of the sync-to-total curve in each model by setting the first derivative of $b_2x + b_3x^2$ to zero (with x representing the uncentered synchronous-to-total ratio), resulting in:

$$\text{Peak Sync-To-Total Ratio} = -b_2/(2*b_3)$$

Parametric measures from the linear regression cannot be used to infer a confidence interval for the position of the peak. Therefore, I performed a nonparametric bootstrap calculation for each model to find the 95% confidence interval for that optimal ratio (see R code below).

To test the level-specific effects, I performed a within-and-between analysis for each outcome, using a composite predictor variable (total interaction, sync-to-total, and sync-to-total squared in the weighted combination indicated by the linear model). Composite variables change the degrees of freedom for the various WABA tests (Schriesheim et al., 1998), and require F-tests in place of t-tests. I could not locate a package in R that explicitly accounts for composite variables in WABA, so I wrote a script to perform this function and calculate the adjusted probabilities for significance levels (see R code below).

I also tested the models controlling for positive affect, negative affect, age, and sex. Since controlling for these variables had virtually no impact on the results, I exclude the controls in this analysis for parsimony.

Results:

As shown in Tables C1 and C2, total leader-follower interaction frequency was associated with increased LMX, communication quality, and leader effectiveness. It had no significant relationship with perceived social support or work-family conflict. Additionally, controlling for interaction frequency, the polynomial terms show strong relationships to all four positive outcome variables, but not to work-family conflict. In each of these four cases, the linear term is positive and the quadratic term is negative, indicating a curve that begins with a positive slope but curves downward. Moreover, the ratio of these two terms is consistent across the four positive outcome variables with the negative curvature coefficient slightly larger than the positive linear coefficient. In each case, this ratio indicates a peaked curve, with the peak in the outcome variable occurring well within the practical range of sync-to-total ratios.

Figure C1 illustrates the results of the bootstrapping calculation for the four peaked relationships described above. It shows that the 95% confidence intervals for the peak of the sync-to-total curves were all contained within the meaningful range for sync-to-total ratios. In each case, the confidence interval for the optimal ratio is noticeably higher than the mean value of this ratio in the sample. That the bootstrap confidence interval extends further to the right than the left of the estimated sample peak can be understood in terms of the confidence bands for the regression curves, which are wider at the ends than the middle. Since the confidence interval for the peak location lies to the right of the sample mean, its lower bound is near the middle of the sample distribution, while its upper bound is further away from the center.

Table C3 summarizes the results of the Within-and-Between Analysis for the four multivariate relationships described above. It illustrates an “equivocal” relationship for all four positive outcomes; both within- and between-group effects contributed significantly to the overall relationships linking interaction frequency and synchronous ratio to the four outcome variables.

Conclusions:

The results suggest that a higher frequency of leader-follower interactions supports positive outcomes for leaders and followers in the remote work setting. In addition, a higher proportion of synchronous interactions is associated with more positive outcomes, but only up to a certain point. For all positive outcomes, there is a meaningful point at which an increase in the percentage of synchronous interactions begins to have a negative effect. In the current sample, the average sync-to-total ratio was generally below the optimum range, suggesting that the workplace could benefit from an increase in the proportion of interactions held over synchronous modes of communication, beyond current levels.

A similar pattern of results emerged both within and between groups. At the individual (within-group) level, followers who interact more frequently with their leaders compared to workgroup peers and struck a more optimal balance of synchronous vs. asynchronous interactions rate their leader better in communication and overall effectiveness, and perceive a higher quality relationship with their leader. At the group level, when leaders interact more frequently and balanced the mode of interaction with all group members, the group rates their leader higher in communication and overall effectiveness, has higher overall levels of social support, and reports better relationships with their leader. Together, the individual and group effects combine to form strong and statistically significant overall effects for these outcomes.

Overall, these findings indicate that leaders and followers can benefit by interacting more frequently in a remote work setting. However, they also need to find an appropriate balance in terms of the modes/technologies they use to interact, not relying too heavily upon either synchronous or asynchronous forms of communication. That the “ideal” proportion of synchronous interactions for key outcomes was higher than the average actually achieved suggests that the organization could benefit from an effort by most leaders to increase synchronous communications with followers.

Tables (Appendix C)

Table C1

Polynomial Regressions Predicting LMX, Leader Communication, Leader Effectiveness

Predictor Variable	Leader-Member Exchange		Remote Leader Communication Quality		Leader Effectiveness	
	Coefficient	95% C.I.	Coefficient	95% C.I.	Coefficient	95% C.I.
Intercept	4.32***	[3.81, 4.84]	3.06***	[2.60, 3.52]	5.04***	[4.10, 5.98]
Log Total Interactions	0.28***	[0.13, 0.43]	0.24***	[.11, 0.37]	0.47***	[0.20, 0.74]
Sync-To-Total	7.06***	[4.28, 9.83]	4.35***	[1.87, 6.84]	9.78***	[4.70, 14.87]
Sync-To-Total Squared	-8.14***	[-11.51, -4.78]	-4.66***	[-7.67, -1.66]	-10.34***	[-16.49, -4.18]
Observations		193		193		192
R ²		0.17		.11		0.12
Adjusted R ²		0.15		.10		0.10
ΔR ² adding last 2 terms		.101***		0.05**		0.06***
Residual Std. Err.		0.99 (df = 189)		.89 (df = 189)		1.82 (df = 186)
F Statistic		12.58*** (df = 3; 189)		7.70*** (df = 3; 189)		8.13*** (df = 3; 188)

Note. C.I. = 95% confidence interval. Sync-To-Total = synchronous interactions as a fraction of total leader-follower interactions. ΔR² reflects change in adjusted R². *p<0.05; **p<0.01; ***p<0.001.

Table C2

Polynomial Regressions Predicting Perceived Social Support, Work-Family Conflict

Predictor Variable	Perceived Social Support		Work-Family Conflict	
	Coefficient	95% C.I.	Coefficient	95% C.I.
Intercept	3.33***	[2.99, 3.66]	2.26***	[1.81, 2.72]
Log Total Interactions	0.07	[-0.03, 0.17]	0.09	[-0.05, 0.22]
Sync-To-Total	2.87***	[1.06, 4.68]	-0.39	[-2.86, 2.08]
Sync-To-Total Squared	-3.60***	[-5.80, -1.41]	-0.53	[-3.52, 2.46]
Observations		193		193
R ²		0.06		0.04
Adjusted R ²		0.05		0.03
ΔR ² adding last 2 terms		0.041**		0.01
Residual Std. Err.		0.65 (df = 189)		0.88 (df = 189)
F Statistic		4.26*** (df = 3; 189)		2.92** (df = 3; 189)

Note. C.I. = 95% confidence interval. Sync-To-Total = synchronous interactions as a fraction of total leader-follower interactions. ΔR² reflects change in adjusted R². *p<0.05; **p<0.01; ***p<0.001.

Table C3

Concise Multivariate Within and Between Analysis for Remote Work Outcomes

	Outcome Variable							
	Leader-Member Exchange		Remote Leader Comm. Quality		Leader Effectiveness		Perceived Social Support	
Between vs. within variation (Composite Predictor x)								
$E_x = \eta_{BX}/\eta_{WX}$	.76	Both	.80	Both	.79	Both	.73 [†]	Weak within
$F_x = (1/E_x^2)(J-K)/(N-J)^a$	.62	Both	.56	Both	.58	Both	.68	Both
Between vs. within variation (Outcome Variable y)								
$E_y = \eta_{BY}/\eta_{WY}$	.64 [†]	Weak within	.73 [†]	Weak within	.70 [†]	Weak within	.65 [†]	Weak within
$F_y = (1/E_y^2)(J-1)/(N-J)^b$	.91	Both	.70	Both	.77	Both	.88	Both
Between correlation and within correlation								
r_{BXY}^c	.47 [*]	-	.32	-	.33	-	.58 ^{***}	-
r_{WXY}^d	.39 ^{***}	-	.32 ^{**}	-	.32 ^{**}	-	.14	-
A test for difference	.09	Both	-.003	Both	.01	Both	.48 [†]	Weak between
Z test for difference ^e	.55	Both	-.02	Both	.07	Both	2.94 ^{**}	Between
Between component vs. within component								
A test for difference	-.11	Both	-.09	Both	-.09	Both	.10	Both
Z test for difference ^e	-.62	Both	-.49	Both	-.51	Both	.54	Both
Overall Induction	Both		Both		Both		Both	

Note. $N = 169$, 47 groups. [†] $\theta^0 > 15^\circ$. ^{††} $\theta^0 > 30^\circ$. * $p < .05$. ** $p < .01$. *** $p < .001$.

^a $df(F) = 122, 44$. ^b $df(F) = 122, 46$. ^c $df(F) = 3, 43$. ^d $df(F) = 3, 118$. ^e $df(Z) = 42, 118$.

Figures (Appendix C)

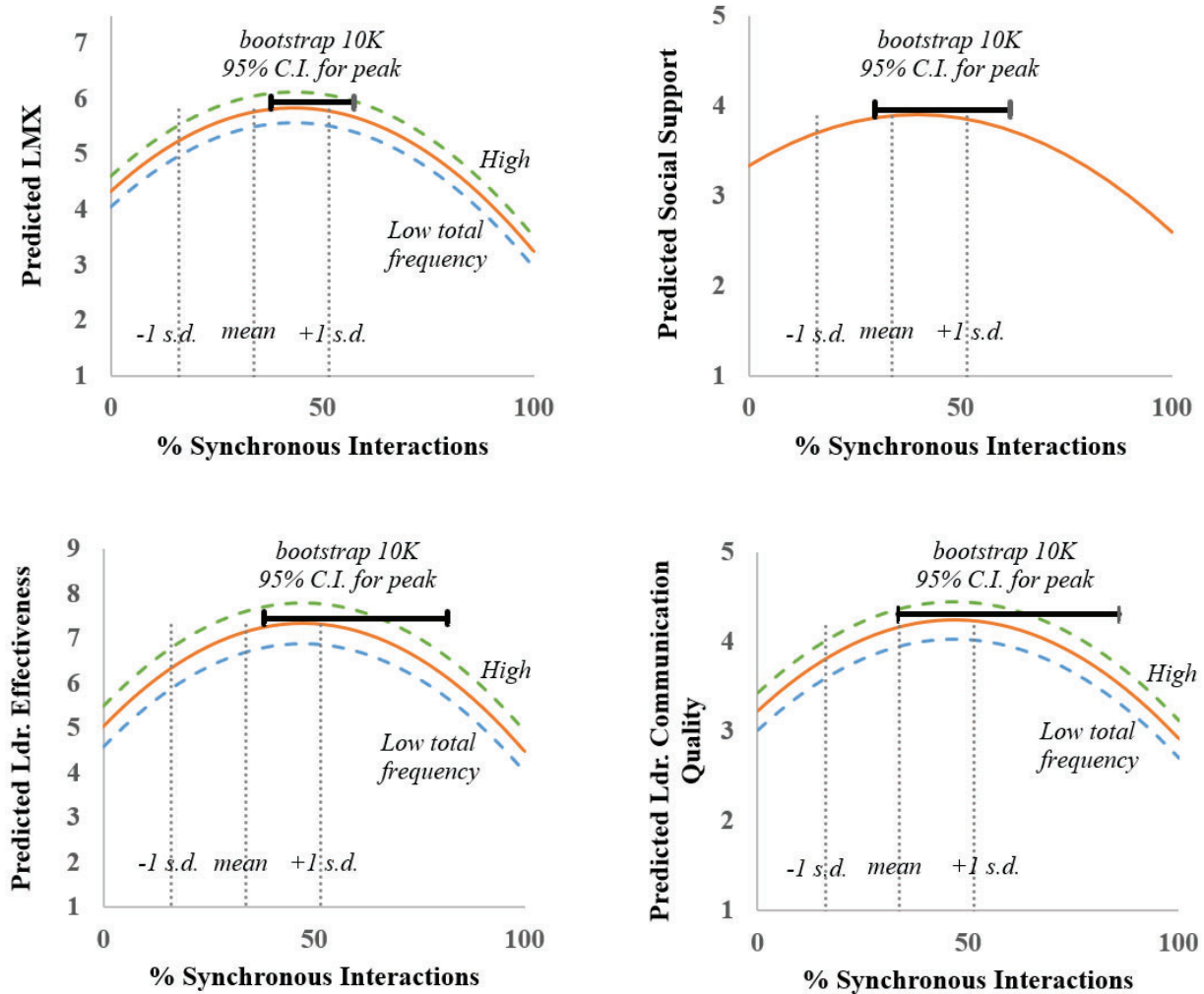


Figure C1. Synchronous Communication Curves. Predicted curves showing the relationship between four dependent variables and ratio of synchronous to total interactions, from regressions listed in Tables C1 and C2. The orange curves are obtained by setting log total interactions to its mean value. For the three dependent variables for which total interactions had a significant effect, the curves corresponding to one standard deviation above and below the mean of log total interactions are depicted by the green and blue dashed curves, respectively. The bold horizontal segment illustrates the 95% confidence interval (“C.I.”) for the position of the curve’s peak. The three vertical dotted lines show the mean ratio of synchronous to total interactions in the sample, and one standard deviation above and below the mean.

R Code for Generating Bootstrap Confidence Intervals for Peak of Curves (Appendix C)

```
# Run function estimating peak for outcome of interest
# In the example below, the function estimates the peak of the curve for LMX

library(boot)
get_idealSyncPct <- function(data, indices){
  d <- data[indices, ] %>% filter(syncToTotal != "Nan")
  model <- lm(d$LmxTotal ~
             d$logTotalInteraction + poly(d$syncToTotal,2,raw=TRUE))
  bvector <- coef(model,complete = TRUE)
  idealSyncPct <- -bvector[3]/2/bvector[4]*100
  idealSyncPct
}

# Run bootstrap for estimates generated by the above function
# In the example below, data is bootstrapped from the data frame "allData3"

set.seed(12345)
boot_peak <- boot(
  allData3,
  R = 10000,
  statistic = get_idealSyncPct)
boot.ci(boot_peak)
```


R Code for Adjusting WABA Package Output for Composite Predictor (Appendix C)

Note: This code assumes that a composite independent variable has been created using unstandardized partial regression weights from a multivariate model. It calculates the corrected F and Z statistics and evaluates the probabilities using the corrected degrees of freedom. For details see Schriesheim (1998).

```
# Run the following function in R before inputting uncorrected WABA measures:
# Ex, Zrb_rw, Rrb, Rrw, Rrtot, Zrb_rw_comp
# N=Number obs.; J=Number Gps.; K=Number Vars. in Composite X

WABA_mod_mult <- function(N, J, K, Ex, Zrb_rw, Rrb, Rrw, Rrtot, Zrb_rw_comp) {
  Fx <- ifelse(Ex>1, Ex^2*(N-J)/(J-1), (J-1)/(N-J)/Ex^2)
  Fx_mod <- ifelse(Ex>1, Fx*(J-1)/(J-K), Fx*(J-K)/(J-1))
  p_etax_bw <- ifelse(Ex>1, pf(Fx, J-1, N-J), 1-pf(Fx, N-J, J-1))
  p_etax_bw_mod <- ifelse(Ex>1, pf(Fx_mod, J-K, N-J), 1-pf(Fx_mod, N-J, J-K))
  Zrb_rw_mod <-
    Zrb_rw*sqrt(((1/(N-J-2)+1/(J-3))/(1/(N-J-1-K)+1/(J-2-K))))
  p_rb_rw <- pnorm(-abs(Zrb_rw))
  p_rb_rw_mod <- pnorm(-abs(Zrb_rw_mod))
  Frb <- Rrb^2*(J-2)
  Frb_mod <- Rrb^2*(J-1-K)/K
  p_rb <- 1-pf(Frb, 1, J-2)
  p_rb_mod <- 1-pf(Frb_mod, K, J-1-K)
  Frw <- Rrw^2*(N-J-2)
  Frw_mod <- Rrw^2*(N-J-1-K)/K
  p_rw <- 1-pf(Frw, 1, N-J-2)
  p_rw_mod <- 1-pf(Frw_mod, K, N-J-1-K)
  Frtot <- Rrtot^2*(N-2)
  Frtot_mod <- Rrtot^2*(N-1-K)/K
  p_rtot <- 1-pf(Frtot, 1, N-2)
  p_rtot_mod <- 1-pf(Frtot_mod, K, N-1-K)
  Zrb_rw_comp_mod <-
    Zrb_rw_comp*sqrt(((1/(N-J-2)+1/(J-3))/(1/(N-J-1-K)+1/(J-2-K))))
  p_rb_rw_comp <- 2*pnorm(-abs(Zrb_rw_comp))
  p_rb_rw_comp_mod <- 2*pnorm(-abs(Zrb_rw_comp_mod))
  WABA_mod_table <- c(Fx=c(Fx, Fx_mod),
    p_etax_bw=c(p_etax_bw, p_etax_bw_mod),
    Zrb_rw=c(Zrb_rw, Zrb_rw_mod),
    p_rb_rw=c(p_rb_rw, p_rb_rw_mod),
    Frb=c(Frb, Frb_mod),
    p_rb=c(p_rb, p_rb_mod),
    Frw=c(Frw, Frw_mod),
    p_rw=c(p_rw, p_rw_mod),
    Frtot=c(Frtot, Frtot_mod),
    p_rtot=c(p_rtot, p_rtot_mod),
    Zrb_rw_comp = c(Zrb_rw_comp, Zrb_rw_comp_mod),
    p_rb_rw_comp=c(p_rb_rw_comp, p_rb_rw_comp_mod))
  as.table(WABA_mod_table)
}

# Enter required input parameters from uncorrected bivariate WABA output
# Example parameters for LMX in Table C3 are shown below

WABA_mod_table <- WABA_mod_mult(169, 47, 3, .761, .564, .533, .423, .456, -.631) %>%
round(digits = 5) %>% view()
```