

Calm Down and Enjoy It: Influence of Leader-Employee Mindfulness on Flow Experience

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Purpose: This study aims to investigate the effect of mindfulness on flow at the organizational and individual levels. Based on perseverative cognition theory, we introduced work-related rumination (affective rumination and problem-solving pondering) as the transmitter in these processes.

Methods: This study conducted a three-wave longitudinal survey. The data of 458 employees and 114 leaders were collected from three software parks in China. Multilevel structural equation modeling and the Markov Chain Monte Carlo method were adopted to test all hypotheses.

Results: Employee mindfulness and leader mindfulness help reduce affective rumination by employees and increase their problem-solving pondering and flow experiences. Affective rumination and problem-solving pondering partially mediate the relationship between leader and employee mindfulness and flow. Leader mindfulness moderates the effects of employees' mindfulness on their affective rumination and problem-solving pondering.

Conclusion: Our findings contribute to the current literature on mindfulness, work-related rumination and flow experience and extend the understanding of the effect boundary of mindfulness. This study also helps guide organizations to better design and carry out mindfulness and flow interventions.

Keywords: leader mindfulness, employee mindfulness, flow experience, work-related rumination

Introduction

Currently, the ideal management practice has shifted from encouraging employees to produce the most output to allowing them to participate in and actively enjoy their work. To improve the happiness and health of employees, in the last 20 years, an increasing number of scholars in the field of organizational behavior have introduced relevant positive psychology concepts (eg, confidence, hope, optimism, and psychological capital) and carried out many studies.¹ Flow experience is a spontaneous psychological state that occurs when people are intensely involved in an activity of intrinsic interest such that nothing else seems to matter.² Based on the theory of Csikszentmihalyi et al.,² Bakker³ introduced the concept of flow to the work context and defined work-related flow experiences as workers' short-term peak experiences at work characterized by absorption, work enjoyment, and intrinsic work motivation. Employees in the flow state often report higher job satisfaction, performance and well-being, so activating this state is important for organizational and personal development.⁴

According to the flow state model and the person-artifact-task model, the fundamental concepts of flow antecedents include a balance between challenge and skill, intrinsic motivation, and clear feedback about progress toward the goal.^{5,6} Meanwhile, all these theories hold that only challenging tasks can activate flow, and thus, employees must recover their psychological resources before they can fully devote themselves to coping with these demands. To recover psychological resources, individuals must psychologically detach from work during nonworking hours.⁷ However, when job demands increase, employees usually experience a perseverative cognition of job demands, which manifests in work-related rumination.

Previous studies proved that rumination is the leading cause of prolonged stress-related affective and physiological activation, which is detrimental to psychological well-being and recovery, and it may also be harmful to employees' flow.⁸ Unfortunately, to our knowledge, only a few studies have considered the effects or antecedents of psychological recovery during nonworking hours on flow.⁹ This is problematic, since the whole perseverative cognition process could be influenced by outside organizational factors in such a way that the entire pathway to flow is altered. Additionally, understanding the effects of these factors would have practical implications for managers to guide their subordinates to experience flow at work.

To this end, we considered the role of mindfulness in employees' perseverative cognition process. Mindfulness refers to the process by which individuals intentionally pay attention to present-moment experiences with a nonjudgmental attitude.¹⁰ Mindfulness is an important psychological resource that helps individuals cope with job demands, improve their psychological resilience, and effectively reduce anxiety, depression, or other physical and mental health problems.¹⁰ Some studies have proven that mindfulness changes employees' negative perceptions of work, which helps them adopt more adaptive cognitive strategies.^{11,12} Eventually, mindfulness helps individuals to reduce rumination regarding adverse events.¹³ However, in recent years, many studies have noted that active rumination regarding work events (ie, actively thinking about how to solve work problems) is beneficial to employees' well-being and health.¹⁴ Therefore, work-related rumination has a double-edged sword effect. Unfortunately, to our knowledge, no studies have noticed the impact of mindfulness on positive rumination at work. Taken together, we predict that individuals' perseverative cognition process may be affected by mindfulness, and this process may play an important role in predicting the flow experience. Hence, work-related rumination may mediate the relation between mindfulness and flow.

For two reasons, we also examine the influence of leader mindfulness on the relationship between employee mindfulness and rumination and flow experience. First, the literature on flow antecedents primarily focuses on the characteristics of work tasks¹⁵ or individual recovery levels¹⁶ but pays insufficient attention to organizational factors, although some scholars have called for such research.^{3,17} Second, leaders' characteristics impact their subordinates' emotional and motivational resources, which subordinates can use to cope with job demands and alter their psychological states.^{18–20} Because of their clearer self-awareness and full attention to their current situations, leaders with high mindfulness levels have better awareness and more efficient responses to their subordinates' psychological requirements.^{20,21} Additionally, mindful leaders are more likely to exhibit positive leadership behavior and form stronger leader-subordinate relationships, changing employees' task cognition and alleviating their negative emotions.^{20,21} However, since we still lack a complete understanding of the influence of mindful leaders on work-related rumination (or flow), this study aims to respond to the calls mentioned above and enrich the existing literature. Although previous studies assumed that mindfulness produces beneficial results for organizations, we hope to clarify the boundary of such positive effects. Specifically, we suggest that only mindful employees perceive positive behaviors from mindful leaders, and only mindful leaders give clear attention to and have awareness of the specific requirements of their subordinates. In that case, the leader-member bond (such as mutual trust, LMX, and communication efficacy) is stronger, and consequently, employee mindfulness has the strongest effect on flow.²⁰

In general, we investigate the effect of mindfulness on flow at the organizational and individual levels and expect to make the following theoretical contributions. First, the extant studies on how mindfulness affects the flow experience are still limited, and our understanding of the internal mechanism is far from complete; thus, this research aims to open the "black box" of mindfulness and flow from the perspective of perseverative cognition. Second, we examine the influence of mindfulness on employees' work-related rumination and flow experiences at various organizational levels, which enriches the research on flow antecedents and deepens our understanding of mindfulness. Third, we build upon the study of Zhang et al²⁰ and test the interaction between leader mindfulness and employee mindfulness, which supports our idea that the positive effect of mindfulness has a specific boundary, and this finding provides a new perspective for follow-up research. In addition to the marginal theoretical contributions, this study also guides organizations to better design and implement mindfulness and flow interventions.

Literature Review and Hypotheses

Perseverative Cognition Theory

Perseverative cognition includes many processes, such as worry, rumination and expected stress. The common feature of these processes is repetition.⁸ According to the perseverative cognition model, stressors can directly cause immediate psychological and physiological arousal, and continuous psychological and physiological activation is the cause of chronic diseases.⁸ When pervasive cognition exists, individuals are unable to control the repeated cognition of stressors, which prolongs the psychological and physiological activation caused by the stressors and finally leads to continuous negative emotional experiences and impairs the function of physical organs. Perseverative cognition causes the individual to repeatedly experience a sense of stress appear; thus, the individual continually experiences the physiological activation and emotional feelings caused by the sense of stress.⁸ Perseverative cognition theory is usually used to explain why rumination plays an intermediary role between work stress and the health, attitudes, and behaviors of individuals.

Work-Related Rumination and Flow Experience

This study starts by clarifying the factors precipitating a flow experience. According to Csikszentmihalyi's² flow state model, clear goals, immediate feedback, a sense of control, and the integration of action and consciousness determine whether an individual can enter the flow state. Similarly, in Finneran et al's²² person-artifact-task model, employees with clear task objectives, the skills to deal with challenges, and task process control are more likely to experience flow. Overall, it is easier for employees who are intrinsically attracted to challenging demands to reach a flow state if all tasks are still within their capabilities and they receive clear feedback on progress toward the goal.^{3,5}

Work-related rumination involves employees thinking about work-related problems or events during nonworking hours.²³ Ruminating employees think about events that have already occurred and have expectations or concerns about upcoming events and problems.²⁴ Ruminations are correlated with prolonged or repeated stress exposure with sustained arousal. Under such circumstances, individuals' psychological resources cannot recover unless they psychologically detach (disconnect) from work.²⁴ Nevertheless, work-related rumination does not always have negative results. For example, some scholars have argued that if employees find solutions to work-related problems outside working hours or positively evaluate their work results, they may experience positive emotions and well-being.²⁴ Drawing from this, Cropley and Zijlstra²³ divided work-related rumination into the following two categories: affective rumination (intrusive, pervasive, and recurrent thoughts about work) and problem-solving pondering (an evaluation of previous work to determine how to improve). In general, affective rumination has a negative valence, while problem-solving pondering has a positive valence. Based on Cropley and Zijlstra's²³ research, we propose that employees' ruminations about their work may positively and negatively affect their flow experiences.

First, during problem-solving pondering, employees attempt to identify meaning and enjoyment in their work, and through this accumulation of resources, they believe in their ability to handle all challenges that they may face, all of which is in line with the conditions for entering the flow state. More specifically, Peifer et al²⁵ suggest that if resource investment (thinking about work-related problems in free time) leads to cross-time resource accumulation (finding a solution to a problem), employees will experience positive emotions (ie, enjoyment) and a sense of accomplishment. According to Fredrickson et al's²⁶ broaden-and-build theory, momentary positive emotions can build enduring psychological resources and trigger upward spirals toward resource accumulation that can be used to cope with job demands. Problem-solving pondering is goal-oriented and includes comparing the current situation with unachieved standards.¹⁶ When individuals feel that they are making progress toward achievement, they experience positive emotions, which provide information about whether the progress toward goal accomplishment is sufficient and whether they should maintain their efforts.²⁷ As a result, these efforts result in increased motivation, which, combined with positive emotions, allows the individual to focus on and enjoy the task.

In contrast, employees engaging in affective rumination tend to concentrate on adverse events at work, which continually consumes their psychological resources and triggers negative emotions.¹⁶ When individuals realize that they cannot obtain resources, their motivation decreases, and they begin to conserve their current resources by narrowing their attention to immediately deal with threats to avoid continuous resource depletion.²⁷ However, when experiencing

negative emotions, employees may ignore the potential opportunities in the organization and re-evaluate or even become suspect of their abilities.²⁸ In such a situation, they may gradually lose confidence. Meanwhile, the negative implications of work tasks will be cognitively amplified and appraised as a severe threat, thus reducing their motivation and effort.²⁸ Finally, these employees will regard the work as an obstacle in their life or career, and their depleted resources will be unable help them face the challenge, none of which meets the conditions for entering a flow state.

Hypothesis 1: Employee problem-solving pondering (H1a) is positively related to flow experience, while affective rumination is negatively related to flow experience (H1b);

Influence of Employee Mindfulness

Based on Bishop et al's²⁹ research, we regard mindfulness as a two-component model. The first component involves the self-regulation of attention, and the second one involves adopting curiosity, openness, and acceptance toward the present moment.²⁹ Many studies have proven that mindfulness is beneficial to employees' health, work attitudes, and behaviors in light of this theory. Therefore, we also draw from this model to suggest that mindfulness may influence work-related rumination through the following two mechanisms.

First, mindfulness increases employees' emotional regulation abilities to calmly and patiently face setbacks or difficulties with an optimistic attitude.³⁰ At the same time, mindfulness requires employees to maintain their awareness of their current circumstances, clearly perceive and accept changes in the environment, and properly deal with negative emotions, all of which boost their sense of control and confidence in adverse environments. Moreover, mindfulness allows individuals to accept rather than judge the events they have just experienced, reducing their reactions to events they previously would have viewed as adverse and, to some extent, increasing their likelihood of experiencing more positive emotions. Finally, mindfulness helps employees eliminate the automatic, habitual pattern of reactivity and reduce their excessive attention to adverse events to recover more quickly by adjusting their cognitive strategies to adapt to new situations.^{31–33}

Second, mindfulness allows employees to continuously and stably focus on the present so that they can avoid the interference of negative emotions in their information processing processes.³⁰ Additionally, mindfulness reduces mind wandering and a habitual distribution of attention by employees, which enables them to concentrate on completing a task.³² Moreover, mindfulness enhances the clarity and vividness of individuals' previous experiences because of their receptive rather than critical consciousness. As a result, employees have a deeper understanding of the meaning of work, a better sense of accomplishment brought by work, a stronger goal-orientation motivation, and a clearer understanding of how to deal with challenges.¹¹ Finally, mindfulness supports employees in acting according to their true self-consciousness by enhancing the awareness of their own emotions, attitudes, and behaviors. Hence, employees who are already task focused are more likely to consciously or unconsciously ponder how to complete these tasks during nonworking hours.³³

Generally, when cognitive flexibility and emotional regulation are improved by mindfulness, employees experience more positive emotions and expand the scope of their behaviors and attention. Consequently, employees enter a resource-gain spiral, which not only alleviates their belief that a task is insurmountable but also reduces their continuous cognition of adverse events. Meanwhile, mindful employees appraise tasks more objectively and believe that they can achieve their goals because of their increased physical and psychological resources. As a sense of overcoming challenging demands and positive emotions arise, employees obtain an elevated sense of accomplishment and goal attainment, build confidence and faith toward reaching their goals, and obtain increased overall resources, which eventually encourages them to enter the flow state.

Hypothesis 2: Mindfulness is positively related to flow experience;

Hypothesis 3: Mindfulness is positively related to problem-solving pondering (H3a) but negatively related to affective rumination (H3b);

Hypothesis 4: Problem-solving pondering (H4a) and affective rumination (H4b) mediate the relationship between mindfulness and flow.

The Direct Effect of Leader Mindfulness

Like employee mindfulness, leader mindfulness is a process by which leaders keep their consciousness anchored in the present experience through their self-regulation of attention toward and awareness of current events with curiosity, openness, and acceptance.²¹ According to sense-making theory, when an organization is in a state of high uncertainty, members interpret what is happening in the surrounding environment through sense construction and sense-making and then decide the next step.³⁴ On the one hand, mindful leaders maintain their awareness of the current situation through sense-making, allowing them to carry out the process of sense construction based on a clear awareness of the environment. By doing so, they can form explanations of various uncertainties; establish cognitive order for all members; and eliminate the confusion, anxiety, and strain caused by cognitive impairment in the organization.³⁵ On the other hand, leader mindfulness helps employees strengthen their understanding of their current situations and establish cognitive and response patterns in line with organizational expectations through sense-giving from their leaders.³⁶ In other words, leader mindfulness may affect employees' rumination processes by altering their cognitive patterns and emotional responses to events.

From the cognitive perspective, leaders convey their environmental cognitions to their subordinates through the sense-giving process.³⁶ Since leaders with high mindfulness levels tend to actively connect with others and have an awareness of employees' needs through efficient information transmission, problem clarification, and cognitive communication, they help employees establish a reasonable explanation of current events, eliminate cognitive barriers, and form a clearer understanding of how to achieve goals. During communication with leaders, employees can perceive leaders as and be affected by leaders' present-centered and nonjudgmental awareness.²⁰ In addition, mindful leaders maintain a curious and open attitude toward their environments and thus encourage their followers to put forward suggestions in the face of uncertainty, which promotes organizational communication efficiency and information exchange.^{20,37} In addition, they set an example for their subordinates regarding how to deal with demanding situations, which enhances employees' confidence in facing difficulties and thinking more actively about how to face challenges.³⁷ In short, mindful leaders help employees reconstruct their perceptions of their current situations through the sense-giving process. They can flexibly adjust their cognitions and enhance their courage to face uncertainties and adversities; therefore, they are more likely to spend resources thinking about how to solve problems.

From the emotional perspective, first, mindful leaders have a clear awareness, so they are sensitive to the difficulties of employees and effectively direct their subordinates to solve problems, which dramatically reduces their anxiety and strain.²⁰ Second, when sensing the mindfulness characteristics (eg, focusing on the present, self-awareness, emotion regulation, and acceptance) of leaders during interactions with them, employees are willing to offer suggestions to the organization. Such benign interactions lead employees to feel trusted and supported by their leaders and organization, resulting in more positive emotions. Third, leader mindfulness also increases leaders' self-control and positive behaviors in their organizations³⁸ and positively moderates the impact of subordinates' mindfulness on leadership-member exchanges and perceived leadership style.^{20,39} In summary, leaders help employees eliminate confusion, anxiety, and tension caused by cognitive impairment and increase these employees' positive emotions through an awareness of the employees' needs and increasing their positive leadership behaviors. Eventually, employees have fewer negative experiences at work, which reduces the possibility of falling into affective rumination.

Hypothesis 5: Leader mindfulness is positively related to employee problem-solving pondering (H5a) but negatively related to employee affective rumination (H5b);

Hypothesis 6: Employee problem-solving pondering (H6a) and affective rumination (H6b) mediate the relationship between leader mindfulness and employee flow experiences.

The Moderating Effect of Leader Mindfulness

Previous logical reasoning assumes that subordinates can perceive a positive impact from the leader's mindfulness. In this section, we suppose that a match between leader and follower mindfulness may be a boundary condition for the influence of employee mindfulness on rumination.

First, as mentioned above, leaders with high levels of mindfulness focus on the present experience and maintain a keen self-awareness so they can better understand and respond to the requirements of their subordinates.²⁰ In addition, leaders with high mindfulness show greater empathy and compassion and maintain relationships with their subordinates through positive leadership behaviors.⁴⁰ More importantly, leaders with high mindfulness levels keep their full attention on the current situation in uncertain environments, setting an example for their confused followers.^{20,21} Subordinates with high levels of mindfulness are more likely to adopt the abovementioned desirable characteristics of their mindful leaders.²¹ Moreover, subordinates may realize that their leaders are willing to deal with their troubles, which cements their trust and respect for the leaders. As a result, workers may experience fewer negative emotions and have more confidence in their ability to cope with demands. Conversely, it is difficult for subordinates with low mindfulness to adopt these desirable characteristics and positive behaviors from leaders. Finally, according to the law of attraction and law of congruence, individuals with similar characteristics often have mutual likes and are attractions.^{41,42} Therefore, when subordinates who are high in mindfulness encounter leaders with high mindfulness levels, both are likely to experience more increased well-being and more positive emotions because of their shared attributes.⁴³

In contrast, leaders with low levels of mindfulness are not fully aware of or attentive to current affairs and, thus, cannot give feedback or express themselves, resulting in inefficient communication.³⁹ Additionally, due to a lack of compassion and empathy, these leaders are unlikely to exhibit behaviors that strengthen interpersonal relationships.⁴³ Therefore, it is difficult for them to assist their subordinates who are experiencing negative emotions. Likewise, due to their deficiency of awareness and attention, subordinates with low levels of mindfulness cannot perceive the characteristics and acts of leaders with low mindfulness levels, so leader mindfulness will not significantly impact them. Furthermore, as suggested in the previous section, when employee mindfulness is low, employees pay more attention to (or are more likely to be affected by) negative experiences rather than actively using about problem-solving methods.⁴⁴

Hypothesis 7: Leader mindfulness moderates the positive relationship between employee mindfulness with problem-solving pondering (H7a) and the negative relationship between employee mindfulness with affective rumination (H7b);

An Integrative Theoretical Model

As mentioned earlier, mindful subordinates maintain their attention to and awareness of current events. Additionally, they are more likely to realize the meaning of work and therefore actively think about how to improve their jobs during nonworking hours, generating positive emotions that increase the speed of resource recovery. Meanwhile, mindful subordinates are good at coping with negative emotions. Therefore, they are less likely to repeatedly think about these negative events during nonworking hours but more likely to experience flow. Therefore, work-related rumination mediates the relationship between employee mindfulness and flow.

Similarly, leaders with high mindfulness levels will engage in positive behaviors that help establish strong interpersonal relationships and provide resources to their followers. As a result, employees will feel supported, and thus, they are more likely to ruminate on how to work hard to provide feedback to the organization. Since they already have enough resources from leaders, subordinates are less likely to experience negative emotions. Therefore, work-related rumination mediates the relationship between leadership mindfulness and flow.

Finally, employees with low levels of mindfulness are not sensitive to the environment or the leaders' characteristics, so they are more vulnerable to negative rumination and are less likely to enter the flow state. Employees with high levels of mindfulness can easily obtain support and attention from their leaders, which may encourage them to actively think about improving their work to a greater extent and avoid the interference of negative emotions, which further affects their flow experience. In contrast, when they realize that their leaders cannot provide sufficient resources or attention, their motivation to fulfill their goals and their emotion regulatory ability may not be as strong, which will reduce their flow experience. Taken together, we propose an integrative moderated mediation model (see [Figure 1](#)):

Hypothesis 8: Leader mindfulness moderates the positive indirect effect of employee mindfulness on flow through problem-solving pondering such that the relationship is more positive for those with higher levels of leader mindfulness;

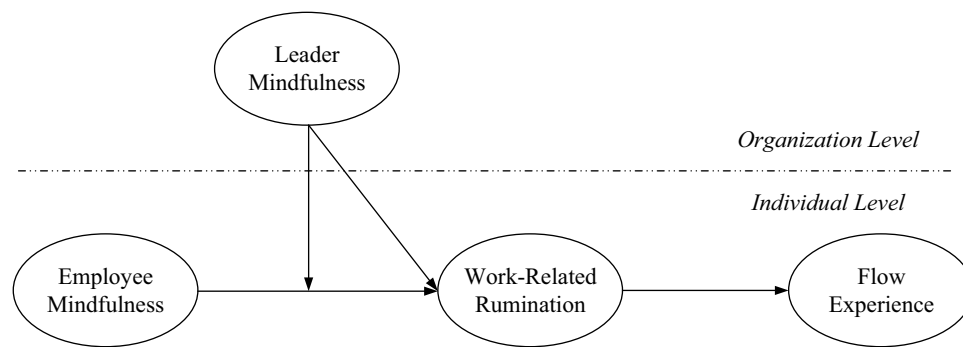


Figure 1 Theoretical model.

Hypothesis 9: Leader mindfulness moderates the negative indirect effect of employee mindfulness on flow through affective rumination such that the relationship is more negative for those with higher levels of leader mindfulness.

Materials and Methods

Participants and Procedures

This research took advantage of the agglomeration of enterprises in high-tech parks in Xi'an, Xiamen, and Shenzhen in China. We first contacted the senior managers of dozens of enterprises and explained our research intentions to obtain their support. We randomly select enterprises in the park, which eliminates the influence of enterprise scale or industry field to a certain extent. In addition, we reviewed the employee information from the personnel department and found that no obvious convergence in employee or leadership samples existed regarding in their industry, university major, marital status, etc. Overall, we believe that our sample is representative and universal.

We collected subjects according to the following two principles: first, none of them had received special mindfulness training; second, they had been in their current positions for more than three months to ensure that they already had a good understanding of the work content and had established stable superior-subordinate relationships. Before conducting the research, we asked the personnel department to exclude all unqualified employees from the list in advance, and only qualified employees were invited to participate in the research.

We randomly selected 44 employees and 13 leaders to conduct a pre survey; they were mainly asked to evaluate whether the questionnaire had unreasonable items, unclear expressions or ambiguity. The results of the cross-sectional data analysis confirmed that the research tool had good reliability and validity.

To reduce the impact of common method variation (CMV), we collected our data at three time points and from various sources. First, before the formal survey (T0), the personnel department provided the demographic information of the leaders and subordinates involved in the study. The questionnaire was distributed in paper form and was sealed and collected after each round of research. All subjects were required to sign the title page of the informed consent form to participate. From the beginning, we made it clear that the research data would only be used for research and that the subjects could withdraw at any time.

The first-round study started in July 2021 (T1). We distributed approximately 600 questionnaires and asked leaders and subordinates to evaluate their mindfulness levels. After discarding questionnaires with overly consistent responses or too many missing values, a total of 552 questionnaires for followers and 129 questionnaires for supervisors were kept after matching according to the code. Two weeks later (T2), visited the companies and asked the employees who had answered completely in the first round to assess their work-related rumination for the past two weeks. Because some employees were transferred to another city or had resigned, we finally collected 537 questionnaires for followers and 123 questionnaires for leaders. After another two weeks (T3), the employees who answered completely in the second round were asked to evaluate the flow experiences they had experienced in the past two weeks. After the survey, there were 458 valid questionnaires for workers and 114 for leaders. The total questionnaire response rate of this study was 86.5%. Those who completed all the questions received supermarket discount coupons worth 50 yuan.

In the leader sample, 48.9% are women, and 34% are in their 30s–40s. In addition, 34% of them have worked for 10–20 years, and 69.6% have attended university or above. In the employee sample, the proportions of men and women are 58.1% and 41.9%, respectively. The ratio of employees aged 20–30 years is the highest (35.7%), and most of the employees have a bachelor's degree or above (92.1%).

Measures

We measured mindfulness through the 15-item mindfulness perception scale (MAAS) developed by Brown and Ryan.⁴⁵ All items are reverse scored. The higher the score is, the higher the mindfulness level. A sample item is, “I find it difficult to focus on what is happening right now (R).” The Cronbach's α is 0.95 for employee mindfulness and 0.91 for leader mindfulness.

We adopted Cropley and Zijlstra's²³ 10-item scale to measure work-related rumination, with five items each for affective rumination and problem-solving pondering. Sample items include, “I think about how to improve my work performance (problem-solving meditation)” and “I am nervous and anxious due to thinking about work-related content”. The Cronbach's α values are 0.91 and 0.87 for affective rumination and problem-solving pondering, respectively.

We used Bakker's¹⁶ 10-item scale to measure flow experience. A sample item is, “when I work, I forget time,” and the Cronbach's α for this scale was 0.89. Flow experience includes the following three dimensions: absorption, enjoyment, and interest. Factor analysis shows that a high-order factor model fit the data better ($\chi^2/df=3.30$, $CFI=0.97$, $RMSEA=0.08$, $AGFI=0.87$) than the single-factor model ($\chi^2/df=5.70$, $CFI=0.94$, $RMSEA=0.12$, $AGFI=0.79$).

All the scales used in our study were back translated and proved to have good reliability and validity, so the items of the original scale did not need to be modified, deleted or added. To avoid taking the central tendency, we allowed all items to range from 1 for “totally disagree” to 6 for “totally agree.”

Drawing from Zhang et al,²⁰ participant gender, age, tenure, job position, and education were included as control variables in this study.

Analytical Approach

We used SPSS 17.0 for data preprocessing, descriptive statistics, and correlation analysis. After that, we conducted a reliability and validity test and a multilevel structural equation model test in Mplus7.4.

Results

Table 1 summarizes the core variables' descriptive statistics, internal consistency reliability, and Pearson correlation. Employee mindfulness is significantly positively correlated with problem-solving pondering ($r=0.38$, $p<0.05$), negatively correlated with affective rumination ($r=-.16$, $p<0.05$), and positively correlated with flow experience ($r=0.28$, $p<0.05$). Similarly, leader mindfulness is significantly positively correlated with employee problem-solving pondering ($r=0.22$, $p<0.05$), negatively related to affective rumination ($r=-.25$, $p<0.05$), and significantly positively correlated with the flow experiences of subordinates ($r=0.32$, $p<0.05$).

We used Mplus 7.4 to test the reliability and validity of the data. First, the Cronbach's α for each scale was greater than 0.7, indicating high internal consistency reliability. Next, we conducted a confirmatory factor analysis to test the best fit model. Table 2 shows that the five-factor model has the best fit ($\chi^2/df=2.75$, $AGFI=0.95$, $RMSEA=0.06$, $CFI=0.98$, $SRMR=0.03$, $TLI=0.95$) and produced significant improvement over the other factor models, indicating good discriminative validity among the variables.

Hypothesis test: Before the analysis, we first group-mean centered all variables at the individual level and grand-mean centered the variables at the organizational level to avoid a spurious cross-level effect and other estimation problems due to multicollinearity.²⁰ We adopted Lepine et al's¹⁸ approach to test our hypotheses with four multilevel structural equation models in Mplus 7.4 to generate less estimate bias. Model 1 allows the overall impact of employee mindfulness on flow experience to be moderated by leader mindfulness, model 2 allows the effect of employee mindfulness on affective rumination to be moderated by leader mindfulness, model 3 allows the impact of employee mindfulness on problem-solving pondering to be moderated by leader mindfulness, and model 4 allows our mediators' (work-related ruminations) partial effects on flow experience to be moderated by leader mindfulness. Table 3 presents the estimation

Table 1 Descriptive Statistics and Correlations

Variables	M	S.D.	1	2	3	4	5
Organization-Level Variables							
1. Leader Mindfulness	76.17	10.28	(0.91)				
Individual-Level Variables							
2. Employee Mindfulness	58.91	18.50	0.10*	(0.95)			
3. Affective Rumination	11.77	5.49	-0.25**	-0.16**	(0.91)		
4. Problem-Solving Pondering	22.93	4.86	0.22**	0.38**	-0.07	(0.87)	
5. Flow Experience	10.30	2.96	0.32**	0.28**	-0.28**	0.35**	(0.89)

Note: **p < 0.05, *p < 0.1.

Table 2 Comparison of Measurement Models

Models	χ^2/df	AGFI	RMSEA	CFI	SRMR	TLI
1. Single-factor mode (LM+EM+PSP+AR+FE)	13.89	0.80	0.18	0.83	0.06	0.66
2. Two-factor model (LM, EM+PSP+AR+FE)	6.34	0.89	0.11	0.95	0.06	0.85
3. Three-factor model (LM, EM, PSP+AR+FE)	6.83	0.89	0.11	0.90	0.06	0.84
4. Four-factor model (LM, EM, PSP, AR+FE)	3.97	0.93	0.08	0.96	0.04	0.91
5. Five-factor model (LM, EM, PSP, AR, FE)	2.75	0.95	0.06	0.98	0.03	0.95

Abbreviations: LM, leader mindfulness; EM, employee mindfulness; PSP, problem-solving pondering; AR, affective rumination; FE, flow experience.

Table 3 Multilevel Structural Equation Modeling Analysis Results

Predictors	Endogenous Variables			
	Flow Experience (Model 1)	Affective Rumination (Model 2)	Problem-Solving Pondering (Model 3)	Flow Experience (Model 4)
Age	-0.09	-0.29**	-0.11	-0.19**
Education	0.32**	-0.10**	0.03	0.49**
Tenure	0.43**	0.15	0.21**	0.38**
Job Position	0.07	-0.12	0.06	-0.09
Employee Mindfulness	0.26**	-0.16**	0.38**	0.27**
Affective Rumination				-0.16**
Problem-Solving Pondering				0.18**
Leader Mindfulness	0.32**	-0.25**	0.22**	0.32**
Employee Mindfulness \times Leader Mindfulness	0.13**	-0.10**	0.13**	0.10**

Note: **p < 0.05.

results of the four models. Model 1 confirms that employee mindfulness has a positive effect on flow experience ($\gamma=0.26$, $p<0.05$); thus, Hypothesis 2 is supported. Model 4 confirms that problem-solving pondering has a positive effect on flow ($\gamma=0.18$, $p<0.05$), but effective rumination has a negative influence on flow ($\gamma=-0.16$, $p<0.05$), which supports Hypothesis 1. Models 2 and 3 show that employee mindfulness has a positive effect on problem-solving pondering ($\gamma=0.38$, $p<0.05$) and a negative effect on affective rumination ($\gamma=-0.16$, $p<0.05$), supporting Hypothesis 3. Similarly, leader mindfulness also has a positive effect on problem-solving pondering ($\gamma=0.22$, $p<0.05$) and has a negative effect on affective rumination ($\gamma=-0.25$, $p<0.05$), supporting Hypothesis 5.

Hypotheses 4 and 6 propose that work-related rumination mediates the relationships among leader mindfulness, employee mindfulness, and employee flow experience. Since the traditional bootstrap approach cannot be applied to multilevel models, we adopted the Markov chain Monte Carlo (MCMC) method recommended by Preacher⁴⁶ and Seligman⁴⁶ and Zhang et al²⁰ for confidence interval estimation. Based on the Gibbs sampler, this method is suitable for

Table 4 Examinations of Indirect Effects

Indirect Effects	Individual Level			Organization Level		
	β	LLCI	ULCI	β	LLCI	ULCI
Through Problem-Solving Pondering	0.005	0.002	0.010	0.014	0.003	0.010
Through Affective Rumination	0.017	0.011	0.024	0.017	0.008	0.029

Note: β , estimated coefficient of indirect effect.

Abbreviations: LLCI, lower limit of confidence interval; ULCI, upper limit of confidence interval.

small sample estimation and controls the type-I error rate better. We initially set 2 Markov chains and conducted 20,000 iterations. Table 4 presents the test results and confidence intervals.

The 95% confidence intervals (CI) are [0.011.024] and [0.002.010] for employee mindfulness affecting the flow experience through problem-solving pondering and affective rumination, respectively; both exclude 0 and indicate that the indirect effect is significant, which supports Hypothesis 4. Similarly, the indirect impact of leader mindfulness on employee rumination is also significant (CI = [0.008.029] and [0.003.010] for problem-solving pondering and affective rumination, respectively, with both excluding 0, which confirms Hypothesis 6. After MCMC analyses, we found that the direct effects of both employee mindfulness and leader mindfulness on flow experience are positive and significant, and the total effects are positive and significant. Since the indirect effects of the two types of work-related rumination are also significant, work-related rumination clearly partially mediates the effect of mindfulness on flow.

Hypothesis 7 proposes that leader mindfulness moderates the relationship between subordinate mindfulness and work-related rumination, and it is supported by the results of Models 2 and 3 in Table 3. Following Zhang et al's²⁰ advice, we conducted a simple slope analysis. We divided the moderator (leader mindfulness) into a high-level group ($M + S.D.$) and low-level group ($M - S.D.$) and made simple slope plots for each group (see Figures 2 and 3). The positive relationship between mindfulness and problem-solving pondering is significant (*simple slope*=0.28, $t=4.03$, $p<0.05$) at higher levels of leader mindfulness and stronger than that at lower levels of leader mindfulness (*simple slope*=0.18, $t=2.56$, $p<0.05$). Similarly, the negative relationship between mindfulness and affective rumination is significant (*simple*

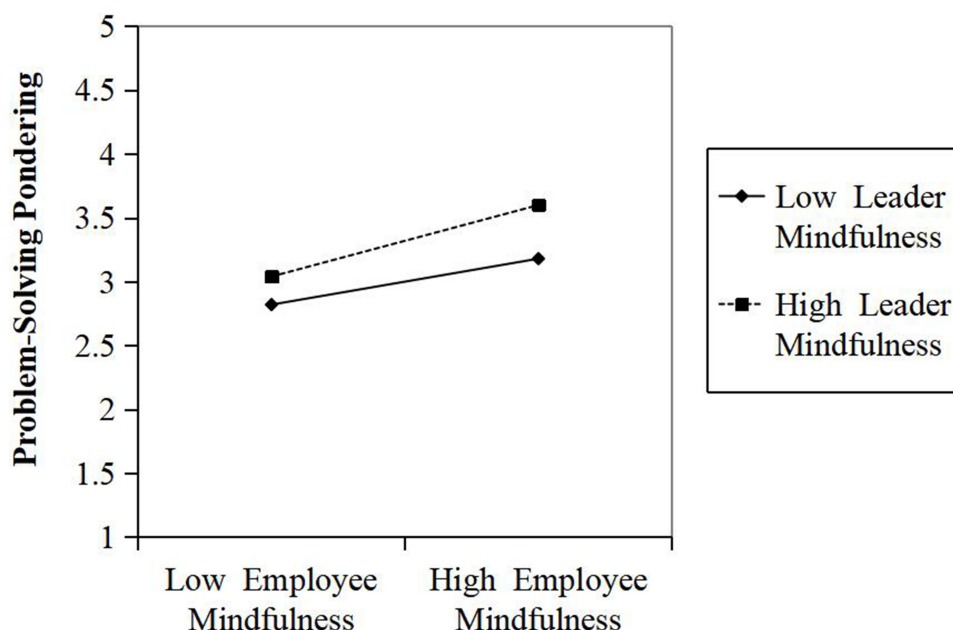


Figure 2 Plot of employee mindfulness × leader mindfulness on problem-solving pondering.

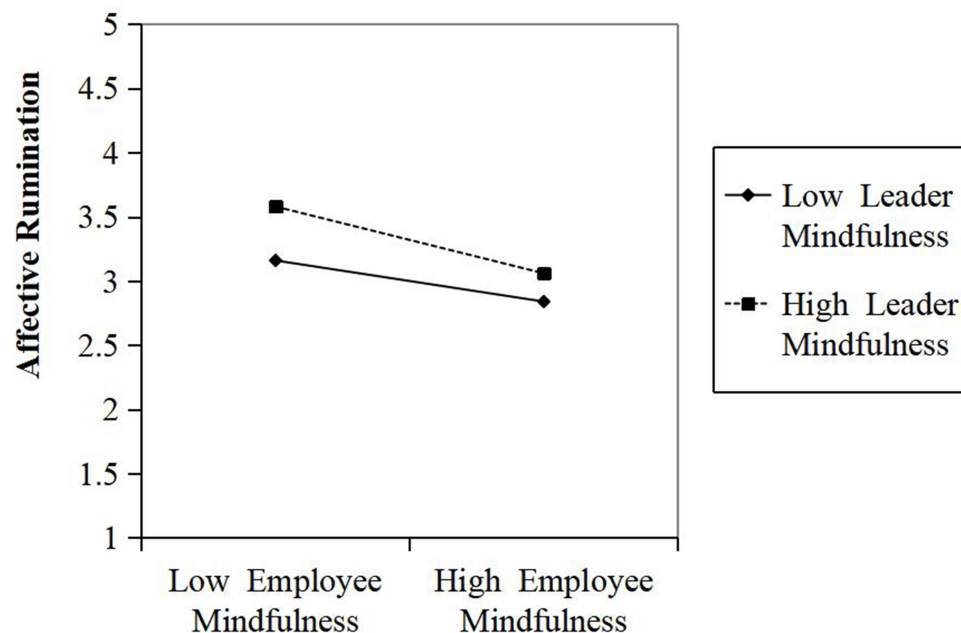


Figure 3 Plot of employee mindfulness × leader mindfulness on affective rumination.

$slope = -0.26$, $t = -2.37$, $p < 0.05$) at higher levels of leader mindfulness and stronger than that at lower levels of leader mindfulness ($simple\ slope = -0.16$, $t = -3.58$, $p < 0.05$). These findings further confirm Hypothesis 7.

Hypotheses 8 and 9 propose that leader mindfulness moderates the mediating effect of employee mindfulness on flow experience via work-related ruminations. The estimation results of the MCMC method based on 20,000 iterations are shown in Table 5. The mediating effects for problem-solving pondering and affective rumination are both significantly enhanced, and the difference for each mediator is significant as well when the leader mindfulness level changes from low to high. Therefore, Hypotheses 8 and 9 are supported. Figures 2 and 3 show that for employees with low levels of mindfulness, the influence of their leaders (regardless of the leader mindfulness level) on work-related rumination shows only a slight difference. Only after employee mindfulness increases do the effects of whether the leader demonstrates high or low levels of mindfulness begin to show a significant difference.

It should be noted that the above hypothesis test results are obtained by controlling for the demographic variables. After removing the control variables, the conclusions of this study show no significant change. In view of this, we believe that our data analysis results confirm the theories in this study.

Discussion

Drawing on sense-making theory and perseverative cognition theory, through the three-wave paired data from 114 leaders and 458 employees, this study proposed and tested a theoretical model from the perspective of leaders and subordinates to investigate whether mindfulness affects the mindfulness flow experience.

Table 5 Examinations of the Moderated Mediation Model

Indirect Effects	Via Problem-Solving Pondering			Via Affective Rumination		
	β	LLCI	ULCI	β	LLCI	ULCI
High Leader Mindfulness	0.017	0.008	0.028	0.009	0.006	0.002
Low Leader Mindfulness	0.008	0.003	0.016	0.004	0.001	0.009
Difference	0.009	0.001	0.019	0.005	0.003	0.011

Note: β , estimated coefficient of indirect effect.

Abbreviations: LLCI, lower limit of confidence interval; ULCI, upper limit of confidence interval.

First, work-related rumination has an opposite effect on mindfulness. Problem-solving pondering promotes the flow experience, while affective rumination inhibits the flow experience. The findings confirm the double-edged sword effect of rumination mentioned by previous scholars.¹⁴ Second, both leader and employee mindfulness have opposite impacts on the two types of work-related rumination. Mindfulness reduces affective rumination by employees, enhances problem-solving pondering, and eventually benefits their flow experience. The findings are consistent with previous scholars' understanding of the positive role of mindfulness in stressful environments.^{37,39} Third, work-related rumination partially mediates the effects of leader-employee mindfulness on flow, which confirms previous scholars' view that the perseverative cognition process of employees may be a good mediating variable connecting stressors and their consequences.⁸ Fourth, leadership mindfulness moderates the impact of employee mindfulness on work-related rumination, which confirms the prior view that the positive role of mindfulness has certain boundaries.¹² Specifically, the positive influence of employee mindfulness on flow experience is strongest when both leader and employee mindfulness are at high levels.

Theoretical Contributions

The primary theoretical contribution of this study is that we explore how employee mindfulness affects employees' perseverative cognition of work content and then affects their flow experiences. We embed this process in a multilevel organizational environment and then investigated how leader mindfulness acts as a critical driving factor.

First, we enrich the research on flow antecedents. Although previous studies have found that individuals can experience more frequent and intense flow in the workplace than during leisure time and that flow experiences have many potential benefits for organizations, our understanding of how flow occurs in the workplace is still far from complete.²⁵ Meanwhile, existing studies on flow antecedents mainly focus on task and tool characteristics, and only a few have considered the effects of individual characteristics and organizational factors. We respond to the call of previous scholars^{3,17} by providing a new theory to explain how employees' perseverative cognition processes can predict their flow experiences.

Second, we open the "black box" of the relationship between mindfulness and flow. Although scholars have emphasized the importance of studying the mechanism underlying the relationship between mindfulness and health outcomes in organizations, this issue has not received much attention.¹¹ Moreover, despite a growing interest in the research on mindfulness and flow in the field of positive psychology, the existing literature fails to prove their relationship or unveil the internal mechanism, and some studies even obtained contradictory results.⁴ Brain science research shows that mindfulness interventions cause structural changes in subjects' gray matter, which provides the physiological basis for flow.⁹ We expand this field from the perspective of cognition and discover that mindfulness offers a cognitive basis for flow. Overall, we provide new supporting evidence for the view that mindfulness promotes flow.

Third, we advance the literature on mindfulness and specifically the influence of various organizational levels. Existing studies mainly focus on the effect of an individual's mindfulness, ignoring whether and how others' (eg, leaders and colleagues) mindfulness affects employees' well-being, attitudes, and behaviors,^{3,10,17} which inhibits our comprehensive understanding of the effectiveness of mindfulness.^{20,21,47} To make up for the limitations of the existing research, we tested the impact of subordinate mindfulness and leader mindfulness on flow simultaneously.

Fourth, we contribute to rumination and perseverative cognition theory. This theory stems from investigating the impact of stressors on individuals' health.⁸ Therefore, most of the existing studies regard stressors and job demands as antecedents, and only a few studies have noticed the impact of perseverative cognition on work attitude, behavior and other variables.¹⁴ We creatively regard the way individuals think (mindfulness) as the antecedent and confirm the mediating effects of rumination on flow, which provides a new research perspective for follow-up scholars.

Finally, our research contributes to a more detailed understanding of the boundaries of mindfulness. At present, a challenge in the field of mindfulness is to define the boundary of its effects.¹² We examined the combined effect of mindfulness from various sources and discovered that leader mindfulness can be regarded as a boundary condition for the positive impact of employee mindfulness.²⁰ Our finding confirms that consistency theory or law of attraction has also explanatory power in the field of mindfulness and provides a new direction for future scholars.

Practical Implications

First, mindfulness allows subordinates to create more positive thoughts on how to improve their work and to have higher emotional regulatory ability, which is conducive to experiencing flow at work. Therefore, we encourage managers to widely implement mindfulness training in their organizations. Leaders and employees can practice mindfulness in the appropriate place or within a specified time through spontaneous and prior arrangements to maintain their best working state.

Second, to enhance the engagement of subordinates at work, managers should pay attention to their thinking regarding work content during nonworking hours. Therefore, managers should encourage employees to review the positive events in their work via daily and weekly reports and try to keep them from falling into repeated thinking about negative events.

Third, leader mindfulness is a situational condition for the positive effects of subordinate mindfulness. Hence, organizations can improve the quality of the relationship between leaders and subordinates by considering the matching of mindfulness between leaders and subordinates at the early stage of team formation. The organization should consider selecting leaders with high mindfulness levels or improve the leader's mindfulness level through mindfulness training to provide effective support for subordinates.

Limitations and Future Research

Although we have obtained some interesting findings, we admit several limitations of this study.

First, although our data came from two independent sources (leaders and subordinates) three times at intervals of 7 days to alleviate the problem of CMV, in essence, we collected our data through a self-reporting questionnaire. Additionally, it may not be easy to fully capture the flow experiences of individuals through a questionnaire. We encourage future research to test our theory using diaries or experiments. Moreover, there are cultural differences that affect the understanding of mindfulness in China and that in Western societies,⁴⁸ but our subjects were all from China; therefore, the external validity of our conclusions is limited. We encourage future research to use larger samples to test the applicability of our research conclusions in various industries and cultures.

Second, the findings do not rule out the interference of other organizational factors. We believe that specific personality traits may contribute to the formation of mindfulness. For example, individuals with an internal locus of control believe that they can control their destinies, so they are more likely to be free from negative emotions and focus on problem solving. Furthermore, leadership style may also affect employee mindfulness, rumination, or flow. For example, Zhang et al¹⁹ found that employees' perceived authentic leadership mediates the relationship between individual mindfulness and well-being. Lepine et al¹⁸ found that charismatic leadership buffers individuals' perceptions of hindrance stress. We believe that the characteristics of employees or leaders should be the focus of future research on mindfulness or rumination.

Third, mindfulness exists in various forms across organizational levels. Our research affirms the importance of mindfulness matching between leaders and subordinates, but the research model does not explore how leader mindfulness affects employee mindfulness. Previous scholars have suggested that leader mindfulness affects subordinates' job satisfaction and mental health by building trust and leadership-member exchange and improving communication efficiency.^{20,21,37} We encourage future research to introduce these organizational variables into our model to provide new explanations for how mindfulness experiences at various organizational levels can transform each other and finally affect employees.

Conclusions

Our research provides new insight into the relationship between mindfulness and flow. Our results show that, in essence, both employee and leader mindfulness can reduce employees' negative work-related ruminations and increase their motivation to solve problems, which eventually enables employees to enter a flow state. In addition, we found that leader mindfulness moderates the relationship between subordinate mindfulness and work-related rumination. Specifically, high leader mindfulness strengthens the positive or negative impact of employee mindfulness on rumination and indirectly

increases the chance of flow. Overall, both leader mindfulness and employee mindfulness are good for flow experiences. Significantly, the most potent positive effect occurs when both leader and employee mindfulness are high.

Ethics Approval and Informed Consent

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee.

Data Sharing Statement

The raw data supporting the conclusions of this article will be made available by the author, without undue reservation, to any qualified researcher.

Ethics Statement

The whole research project was completed under the approval and supervision of the Xiamen Guoxin Credit Big Data Innovation Research Institute (Ethics Committee).

The author declares that he has followed the guidelines outlined in the Declaration of Helsinki.

The author declares that he has obtained informed consent from the study participants. Only the questionnaires with informed consent forms signed by the subjects are valid in this study.

On the title page of the questionnaire, all participants were told why the research was being conducted, whether or not anonymity was assured, and how the data they were providing were being stored and used. Those who are worried about the use of the data or the purpose of this study could refuse to participate in the study or withdraw from the study at any time to ensure their right to confidentiality.

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Disclosure

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