THE SIGNIFICANCE OF PSYCHOLOGICAL SAFETY — THE EXPLORATION OF A MODERATED-MEDIATION MODEL

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Abstract

Drawing on self-determination theory (SDT) (Deci & Ryan, 2000, 2008a, 2008b, 1985; Ryan & Deci, 2000, 2017, 2019; Ryan et al., 2019, 2021) and conservation of resources (COR) theory (Hobfoll, 1989, 2004, 2011), this study constructed an mindfulness-employee involvement (M-EI) model to explore the mechanism of enhancing psychological safety (Edmondson, 1999; Edmondson & Lei, 2014; Dekker & Edmondson, 2022) by leveraging mindfulness (Baer et al., 2006; Hou et al., 2014; Kudesia, 2019) and employee involvement practices (Lawler, 1994; Riordan et al., 2005; Wood, 2020). Specifically, the study explored whether an organization or individuals are responsible for making people feel safe, as well as how COVID-19 lockdown practices could impact the above-mentioned mechanism. A quantitative survey was conducted and analysed via structural equation modelling. The regression results supported both a positive, direct correlation between mindfulness and psychological safety and an indirect correlation via employee involvement moderated (i.e., made less positive) by COVID-19 lockdown practices. Considering the uniqueness of Chinese culture, the Five Facet Mindfulness Questionnaire (FFMQ) 18 with a better model fit was constructed as the measurement for mindfulness. It is important to leverage both intrinsic and extrinsic factors to enhance psychological safety levels, allowing better mental health, accumulated intrinsic motivation, and greater autonomy at work for sustainable growth.

Keywords: Mindfulness, Employee Involvement, Psychological Safety, COVID-19 Lockdown, Self-Determination Theory (SDT), Conservation of Resource Theory (COR)

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1. INTRODUCTION

"Psychological safety" is a buzzword in modern psychology, yet it is also easily neglected by organizations as too far removed from "business". However, Workhuman's (2021) new study in 2021 yielded certain noteworthy findings: only 26% of the employees surveyed declared that they felt psychologically safe during the pandemic, 48% of the employees somewhat or strongly agreed that they had experienced burnout, 61% admitted that they had experienced intensified stress and 32% somewhat or strongly agreed that they had felt lonely at work. According to Maslow's hierarchy (Maslow, 1943), safety is a "basic human need". In a business environment, psychological safety should be treated not as a perk but as a crucial part of a company's culture and future, as it contributes to an inclusive, diverse, and accepting workplace in which team members are safe to voice opinions, have a sense of belonging and are respected and in which they can be more creative and express their true selves. Leaders must ask whether they give their teams the freedom to experiment, take risks, fail, and come back stronger. They must give themselves the same permission to face fears and be brave enough to pick the unconventional road and break boundaries.

Psychological safety is an important topic of research in various fields, including psychology, behavioral management, leadership, teams, and healthcare. It becomes even more important under volatile, uncertain, complex, and ambiguous circumstances, such as organizational changes, pandemics, and the emergence of new technology. Psychological safety refers to a shared value of individual safety for interpersonal risk-taking that allows the members of a team to challenge, question, and disagree freely (Edmondson et al., 2007; Edmondson & Lei, 2014; Dekker & Edmondson, 2022). In other words, when their psychological safety level is high, individuals feel safe in expressing themselves without incurring harm to their self-image, status, or career (Kahn, 1990). However, the mechanism by which an organization can enhance psychological safety remains unclear. Furthermore, the majority of relevant studies have examined exogenous factors in empirical research based on Western and developed economies, while very few have explored the intrinsic factors or focused on emerging economies. Even fewer have studied the impact of COVID-19 lockdowns.

In light of these limitations of the literature and building on the foundations laid by prior studies, this study advances the understanding of psychological safety in several important ways. First, with reference to self-determination theory (SDT) and conservation of resource (COR) theory an mindfulness-employee involvement (M-EI) model was constructed to examine the mechanism by which intrinsic factor mindfulness and external employee involvement practice work together to predict psychological safety levels. Second, the study examined mindfulness as a root construct, thereby enriching the literature on psychological safety, and extending the scope of empirical research to cover emerging economies. Third, the study established a direct causal relationship between mindfulness and employee involvement, thus laying the ground for future studies on the subject to further define this mechanism as well as the boundaries thereof. Furthermore, the impact of COVID-19 lockdowns was examined to identify practical implications. Last but not least, the paper sheds light on certain cultural distinctions in terms of mindfulness constructs.

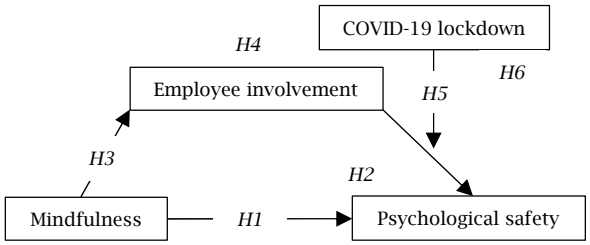
The study consists of the following sections. Section 2 of this paper reviews a literature and the study's hypotheses. Section 3 introduces the methodology. The analytical results are revealed in Section 4. Section 5 presents the discussion while Section 6 summarizes the findings with conclusions and implications.

2. LITERATURE REVIEW AND HYPOTHESES

2.1. Research framework

Empirical studies of psychological safety may be categorized into two types, based on extrinsic supporting context, leadership behaviors, and supporting practices. Research has empirically shown that leader inclusiveness (Bienefeld & Grote, 2014; Carmeli et al., 2010), support (May et al., 2004), trustworthiness (Madjar & Ortiz-Walters, 2009), openness (Detert & Burris, 2007) and behavioral integrity (Palanski & Vogelgesang, 2011) have a strong influence on employees perceived psychological safety, which in turn drives employee outcomes such as job performance and engagement, voice behaviors, and involvement in creative work (Newman et al., 2017). Other research has revealed how supportive organizational practices and interpersonal networking, such as access to mentoring (Chen et al., 2014) and diversity practices (Singh et al., 2013), can influence levels of psychological safety and ultimately contribute to work performance. The current study built on SDT and COR theories, integrating intrinsic mindfulness and extrinsic regulations (employee involvement practices and COVID-19 lockdown practices) to construct an M-EI model (see Figure 1) to explore the mechanism of predicting psychological safety.

Figure 1. M-EI model



2.2. Mindfulness

Mindfulness originated from Buddhist philosophy, and the term was first derived from the Pali word *sati*, meaning awareness, attention, and remembering; this is why a lot of discussions of mindfulness focused on mindful attention (Siegel et al., 2009), including aspects of presence, awareness, and attention. Later, the concept of metacognitive practice was introduced, which blends insights from metacognitive and practice theory and addresses why mindfulness matters in the context of

organizations. Consequently, this new subject was officially adopted in the field of organizational science. The study of mindfulness has moved from the East to the West, aggregated from individual mindfulness to collective mindfulness, and extended in scope from clinical psychology research to cover organization management research as well.

However, researchers have thus far failed to agree on the definition of "mindfulness" or on theories and comprehensive methodologies to operationalize the construct. Generally, the concept of "mindfulness" can be categorized into three focuses. Certain scholars have classified these focuses as mindful attention, mindful conceptualization, and mindful metacognition (Oswick et al., 2011; Kudesia, 2019), which include elements such as presence, awareness, attention, cognitive processing, and attitude cultivation. Kudesia (2019) described it as a "metacognitive process" involving tailoring one's information processing to a given set of circumstances rather than a single method of processing. Its processing relies heavily on self-regulation and it clearly reflects an accepting and open orientation, with non-judgmental attention, toward one's experience of the present (Bishop et al., 2004). Thus, mindfulness covers both cognition and practice aspects. It varies from person to person, as it is influenced by personality traits, and it can be acquired and enhanced through mindfulness training, meaning that it can vary within a person as well.

2.3. Employee involvement

The concept of "employee involvement" has been diversified and enjoyed wide currency amongst academics and practitioners. It was first referred to as "job involvement", or an individual's psychological identification with his/her job (Kanungo, 1982; Lawler & Hall, 1970; Lodahl & Kejnar, 1965; Rabinowitz & Hall, 1977; Judeh, 2011). Later, the term "employee involvement" was used to refer to a list of practices that "are initiated principally by management and are designed to increase employee information about and commitment to the organization" (Fenton-O'Creevy, 1998, p. 68). It was also used to refer to the degree to which an employee is cognitively preoccupied with, engaged in, and concerned with his/her job (Paullay et al., 1994; Judeh, 2011). Research on employee involvement has been conducted from two main perspectives: first, employee involvement practices from the firm perspective, also known as "intended involvement programs" (Glew et al., 1995; Truss, 2001), and second, employee involvement climate, exploring the extent of employees' involvement from the employees' point of view (Riordan et al., 2005).

The study of employee involvement has returned to the traditional, practice-oriented approach, with two possible dimensions, determined by the focus of the particular study (Wood, 2020). The first dimension is job involvement, which focuses on core jobs from the employee perspective and is associated with entrusting employees with autonomy and responsibility at work (Wall et al., 2004; Wood et al., 2012). The second dimension is organizational involvement which is from the perspective of the organization; this focuses on allowing employees to go beyond their job description and participate in decision-making and other aspects of the business (Benson & Lawler, 2003). In the words of Wall et al. (2004), organizational involvement enables employees to contribute to decisions on the management and strategy of their organizations.

In this paper, employee involvement is viewed as a set of effective, external regulations that allow the employees: 1) to participate in decision-making both relevant and non-relevant to their jobs; 2) to effectively exchange information; 3) to update their knowledge to develop effectiveness; 4) to be autonomous in the way they conduct their work, and 5) to have a say in the organization's compensation and reward system (Lawler, 1994; Freeman et al., 2000; Riordan et al., 2005).

2.4. Intrinsic and autonomous mindfulness vs. extrinsic and supportive employee involvement

SDT is a theory in the field of psychology regarding human motivations. It asserts that human behaviors are influenced by both personal and contextual motivational factors (Ryan & Deci, 2017). The theory covers basic issues such as universal psychological needs, self-regulation, and how social environments affect behavior, motivation, and well-being (Deci & Ryan, 2008a, 2008b). SDT categorizes motivation into intrinsic and extrinsic, autonomous and controlled types, and emphasizes that the type of motivation, compared with the amount of motivation, is a greater determinant in predicting life's important outcomes. Different from conventional motivation theory, which emphasizes how external factors (extrinsic/controlled motivations) affect a person's behavior (Ryan et al., 2019), SDT focuses on how actions are naturalistically organized within persons through both intrinsic and internalized extrinsic motivations (Ryan & Deci, 2019).

SDT pertains to mindfulness in that mindfulness enhances individuals' well-being through self-regulated activities and satisfies their three basic psychological needs, namely their need for competence, autonomy, and relatedness (Hodgins & Knee, 2002). Thus, mindfulness is highly associated with intrinsic and autonomous motivation, contributing to a range of positive psychological and behavioral outcomes (Deci & Ryan, 2008a, 2008b). Promoting mindfulness fosters inward reflection, in-depth examination of one's needs and feelings, and the growth of a more autonomous orientation (Deci & Ryan, 2008a, 2008b). Research has established that mindfulness positively impacts psychological well-being (PWB), self-compassion, agreeableness, and openness, which are crucial for psychological safety (Hollis-Walker & Colosimo, 2011). In addition, Sheldon et al. (1996) found that individuals' traits of perceived autonomy and perceived competence were significantly correlated with their levels of well-being. Therefore, there is strong support for the first hypothesis:

H1: Mindfulness is positively associated with psychological safety.

Employee involvement is a supportive condition of a working environment that fulfills individuals' psychological need for relatedness (Deci & Ryan, 2000) and influences the psychological safety level as an internalized, extrinsic motivation. SDT also points out that when employees' basic

psychological needs are met, they are more likely to display agency, which boosts their psychological growth and development (Deci & Ryan, 2000).

Furthermore, COR argues that people have a basic motivation to obtain, retain and protect various kinds of resources, including objects of belongings (cars, house), conditions (marriage, job stability), personal characteristics (social self-worth, high self-esteem), and energies (credit, money, favor), that they value (Hobfoll, 1989, 2004, 2011). The loss or threat of loss of resources and the failure to gain resources after effort investment can bring psychological stress (Hobfoll, 1989, 2004, 2011; Iskra-Golec et al., 2016). The psychological safety concern is a type of psychological stress when job security and work outcomes, including relationships, individual performance, bonus, reward, reputation, and autonomy, are threatened under certain circumstances.

In a work environment, employee involvement practices give employees ways to express their opinions on matters, conditions, and terms of employment that are crucial for enhancing individual performance (Wood, 2020). In addition, job autonomy, participation, teamwork, and involvement in decision-making can bring individuals knowledge, information, and a sense of control, all of which are "valuable resources" that individuals seek. When an employee's involvement level is low, his or her chances to obtain information or the needed sense of control are reduced, which can be deemed as a type of resource loss, imposes extra psychological stress, and impacts the individual's psychological safety level, according to COR. This raises second hypothesis:

H2: Employee involvement is positively related to psychological safety.

2.5. Mindfulness, employee involvement, and psychological safety

Psychological safety (or well-being) is "an organismic function" by which a person self-perceives their psychological flexibility, spirit, and sense of inner well-being (Deci & Ryan, 2000; Ryan & Deci, 2002). This is defined by the individual's "security" level and is influenced by the environmental context, which includes external regulations, interactive relationships, and certain policies. A secure base, as Deci and Ryan (2000) explained, provides the necessary support for intrinsic motivation and fosters innate growth tendencies.

Furthermore, SDT proposes that individuals' safety level is determined by how effectively they can transform (internalize) external regulations (employee involvement) into inner values (Ryan, 1993; Schafer, 1968). When external regulations are fully internalized, they are fully accepted, assimilated, and integrated into an individual's sense of self. However, when individuals fail to complete the internalization process, external regulations remain external, introjected, or unintegrated (Deci & Ryan, 2000; Ryan & Deci, 2000, 2002). In other words, the stronger a person's identification with a regulation, the closer the quality of regulation comes to the quality of intrinsic motivation. Mindfulness, which is closely linked with intrinsic motivation, can reflect the extent to which people actively process and internalize regulation, thus defining the degree of internalization process and self-determined behavior. From this perspective, mindfulness is believed to be the root construct for psychological safety both directly and indirectly via employee involvement. On the other hand, mindfulness also serves to be the intrapersonal process that helps to mobilize self-motivation (Ryan et al., 2021), and experience pleasure and satisfaction the moment the behavior occurs (Donald et al., 2020).

Research has also shown that intrinsic or autonomous motivations contribute to higher levels of engagement, greater persistence, better creativity, enhanced quality of learning, and greater well-being (Deci & Ryan, 2000), while controlled motivations bring lower performance (Deci & Ryan, 2000) and engagement (Walker et al., 2006). As Marc Benioff, CEO of Salesforce[1] once commented: "Having a beginner's mind (mindfulness training) informs my management style. I'm trying to listen deeply, and the beginner's mind is informing me to step back so that I can create what want to be, not what was. I know that the future does not equal the past. I know that I have to be here in the moment" (Gelles, 2018, para. 45). This approach enables better focus and engagement in supplementary employee involvement practices to foster the internalization of extrinsic motivation, reinforce the psychological safety level and foster a climate of employee involvement. Ellen Langer, one of the first scholars of mindfulness, stated: "Mindfulness, for me, is the very simple process of actively noticing new things. When you actively notice new things that put you in the present, makes you sensitive to context. As you're noticing new things, it's engaging" (Beard, 2014, p. 68). Individuals can proactively engage in certain activities to involve and internalize extrinsic factors when their mindfulness level is high. Therefore, the following hypotheses are proposed:

H3: Mindfulness is positively related to employee involvement.

H4: Employee involvement partially mediates the relationship between mindfulness and psychological safety.

2.6. Employee involvement, COVID-19 lockdown, and psychological safety

COVID-19 is a *force majeure*, and the lockdown policy is an external regulation. Scientifically, lockdown robs people of the fundamental needs of social networking, from a social perspective, and makes it difficult to execute employee involvement practices involving physical contact, from a management standpoint. As a result, the COVID-19 lockdown may be expected to affect employee involvement practices by making physical contact difficult, as in the following hypotheses:

H5: COVID-19 lockdowns moderate (i.e., weaken) the positive relationship between employee involvement and psychological safety.

H6: The indirect positive relationship between mindfulness and psychological safety via employee involvement is moderated (i.e., lessened) by COVID-19 lockdowns.

[1] https://www.salesforce.com

3. RESEARCH METHODOLOGY

3.1. Sample

A survey methodology was applied; the survey questions were published on WenJuanXing (an online survey tool in China), and the responses were collected in two batches and supplemented with a brief introduction with instructions. One batch (43 responses) was collected mainly from two foreign-owned companies (one American company and one Japanese company) in Suzhou, and the other batch was sent to 461 people from an Alumni Contact Group of Nanjing University and Nanjing University of Science and Technology, asking for voluntary feedback. A total of 210 responses were received, and the response rate is 42%. It was determined in the pilot to run that the average time required to complete all of the survey questions was around 4 min. (240 sec.). Ten surveys that were completed in 150 seconds or less were dropped, and three responses from duplicated IP addresses were removed as well. Four responses from respondents younger than 18 according to their stated birth dates were also taken out. The final sample of valid responses was 193 (n = 193), and the effective response rate was approximately 92%.

The survey questions were translated from the original English constructs into Chinese, and to verify the translation accuracy and content validity, they were further reviewed by two Ph.D. students in the field of organizational behavior and verified via reverse translation. The 50 survey questions included 20 questions to measure independent variable *mindfulness*, 8 questions to measure mediator *employee involvement*, 11 questions to measure dependent variable *psychological safety*, and 10 descriptive questions to collect demographic and situational information, namely age, education background, position, length of employment, gender, marital status, company nature, company size, and industry. Personal contact information is optional.

Dummy variables (*Yes* = 1, *No* = 0) were created as control variables, based on the demographic information provided, to examine the impacts caused by having children (or not), position (management or non-management), company nature (state-owned or non-state owned), industries severely impacted by COVID-19 (or not) and severe COVID-19 lockdown practices (with or without). Length of *employment*, *company size*, and *education background* was treated as continuous variables, as their values involved a degree of development.

In terms of gender, 53% of the respondents were male (n = 103) and 47% were female (n = 90). In addition, 38% (n = 74) of them had experienced a severe COVID-19 lockdown of at least 60 consecutive days, and 69% of them had children (n = 134). They were employed in various industries: service (n = 42, 22%), comprising individuals from hotel and service, real estate, financial intermediary, retail, and logistics industries; technology (n = 20, 10%); industrial (n = 103, 53%), comprising individuals from industrial and construction industries; and government-related (n = 28, 14%), comprising individuals from government and education industries. The participants' ages ranged from 22 to 59, with an average of 37 years. The majority had attained at least some college education, with some college (n = 12, 6%), bachelor's degree (n = 118, 61%), or a master's degree or above (n = 61, 32%). In terms of employment experience, 50% (n = 96) of the participants had been employed in their current organization for over 7 years, 48% (n = 93) of them were in management positions, 33% (n = 63) were employed in a company with over 500 employees and 20% (n = 38) of them had a background in government or with a state-owned company.

3.2. Measurements

3.2.1. Psychological safety

Edmondson's (1999) instruments were adopted to measure psychological safety. The responses were constructed on a 6-point Likert scale ranging from 1 ("completely disagree") to 6 ("completely agree").

3.2.2. Mindfulness

Five Facet Mindfulness Questionnaire (FFMQ) is a self-administered and self-scorable measurement consisting of 39 items to measure five dimensions of mindfulness, namely description, non-judgmental experience, observation, aware actions, and non-reactivity. It is considered to be the most comprehensive version for mindfulness measurements, as these five dimensions were identified based on a factor analysis of a pool of items combined from various measurement scales. As such, the FFMQ illustrates that mindfulness is a multidimensional skill rather than a combination of separate skills. Abbreviated versions of the FFMQ consisting of around 15–24 items have been constructed by eliminating statements that the researchers felt were unsuited to their population (Baer et al., 2012; Gu et al., 2016). FFMQ short form (FFMQ-SF, 20), which includes 20 questions (Deng et al., 2011; Hou et al., 2014), is one of these shortened versions. Given the Chinese setting of the research sample for this paper and the purpose of the study (which was not to analyze the relationship among factors of mindfulness in depth to make accurate comparisons but instead to generally assess where individuals stand in terms of self-awareness and mindfulness), the FFMQ-SF (20), which has convergent validity and good internal reliability (Hou et al., 2014), was adopted in the paper to measure the participants' mindfulness. The 20 items included in FFMQ-SF (20) were selected from those of the original FFMQ (39) developed by Baer et al. (2006), which was verified with both community and clinical samples in Hongkong (Hou et al., 2014).

The measurements were also organized on 6-point Likert scales, including direct scoring for questions 1 to 12 and reverse scoring for questions 13 to 20. The participants were asked to rate their responses from 1 ("almost never") to 6 ("almost always").

3.2.3. Employee involvement

In terms of measurements of employee involvement levels, there is limited coverage in the literature. This study used the scales on employee involvement included in Dr. Cheri Ostroff's human resource

practice (HRP) survey, which emphasizes autonomy, reward, participation, decision-making, and teamwork (Freeman et al., 2000), as it has a broad view of employee involvement practices and considers the 5 dimensions of *employee involvement* (structure ranging from formal to informal, form ranging from direct to the indirect, degree of involvement, decision issue and decision process) raised by Black and Gregersen (1997). In addition, both the two involvement perspectives — job involvement and organizational involvement are included as well (De Menezes & Wood, 2006).

The measurements were also given on a 6-point Likert scale: the participants were asked to rate their responses from 1 ("strongly disagree") to 6 ("strongly agree") to indicate the degree of involvement.

4. RESEARCH RESULTS

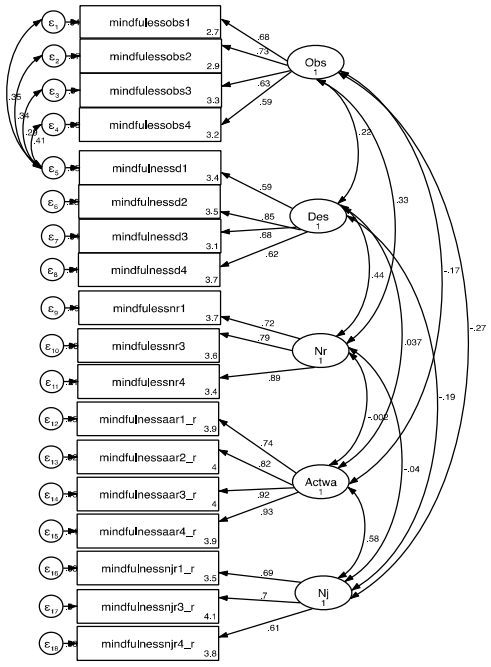
All of the analyses were conducted using Stata 17MP. First, confirmatory factor analysis was conducted and Cronbach's alpha was measured to check the internal reliability. To verify the proposed M-EI model (Figure 1) and corresponding hypotheses, statistic regression was run in four phases. Phase one entailed running a hierarchical regression to check the direct causal relationship between *mindfulness*, *employee involvement*, *COVID-19 lockdown*, and *psychological safety*, including the control variables in the first step and *mindfulness* in the second step (*H1*), *employee involvement* at step 3 (*H2*) and *COVID-19 lockdown* at step 4 (*H6*). The aim of phase two was to verify the mediation effect of *employee involvement* via the "medsem" package in Stata with two models. Model one was used to determine the direct impact of *mindfulness* on *employee involvement* and of *mindfulness* on *psychological safety*, while model two was applied to test the causal relationship between *employee involvement* and *psychological safety*. A Sobel test was run to check the significance of the mediation effect (*H3* and *H4*). Phase three was aimed at verifying the moderation effect of the *COVID-19 lockdown* on the relationship between *employee involvement* and *psychological safety* via multilevel regression. The aim of phase four was to verify the moderated mediation of the entire model, checking the significance of the mediation of the effect of *mindfulness* on *psychological safety*.

4.1. Internal reliability and confirmatory factor analysis

All of the scales showed good internal consistency according to Cronbach's alpha results for the variables. In terms of measuring *mindfulness*, the 20 questions taken from the original FFMQ-39 included four items (15, 20, 26, 31) measuring "observing"; four items (2, 7, 27, 32) measuring "describing"; four items (5R, 8R, 13R, 38R) measuring "acting with awareness"; four items (10R, 17R, 25R, 30R) measuring "non-judging"; and four items (19, 21, 24, 33) measuring "non-reacting" (R — indicates reversed questions) (Hou et al., 2014). Cronbach's alpha for each of the five facets showed reasonable to the strong interpretation of internal reliability (Taber, 2018) (observing = 0.75, describing = 0.78; non-reacting = 0.78, act with awareness = 0.91, non-judging = 0.68). Similar to that which Deng et al. (2011) found in mainland China and Hou et al. (2014) found in Hongkong, better consistency in describing and act with awareness were found. Cronbach's alpha for *employee involvement* and *psychological safety* was 0.91 and 0.93 respectively.

As the mindfulness scale FFMQ-SF (20) by Hou (2014) includes five facets, confirmatory factor analysis was performed to evaluate the fitness of the model, and two constructs were found to have a factor loading below 0.50. The two items were "In difficult situations, I can pause without immediately reacting" (Baer et al., 2006, p. 34) for non-reacting (standardized factor loading = 0.30) and "I make judgments about whether my thoughts are good or bad" (Baer et al., 2006, p. 35) for non-judging (standardized factor loading = 0.37). Hair et al. (2009) suggested that standardized loading estimates should be 0.5 or higher, and Comrey and Lee (1992) argued that a loading below 0.45 was considered to be below fair; therefore, these two items were deleted, leaving 18 questions in the shortened FFMQ (FFMQ-18). Five-factor model analysis (Figure 2) was performed to test the internal reliability of the FFMQ-18, and the statistics suggest a good model fit (comparative fit index (CFI) = 0.98, Tucker-Lewis's index (TLI) = 0.97, root mean squared error range (RMSER) = 0.039, $p > 0.05$, and standardized root mean square residual (SRMR) = 0.056). The chi-square statistic was not used as a model fit index due to its sensitivity to sample size (Babyak & Green, 2010), and in practice, the chi-square test is "not always the final word in assessing fit" (West et al., 2012). The Cronbach's alpha value for five facets also showed improvements in the FFMQ-18 constructs (observing = 0.75, describing = 0.78, non-reacting = 0.84, act with awareness = 0.91, non-judging = 0.70). The mean was then calculated for the 18 measurements (11 direct items and 7 reverse items) included in the FFMQ-18 as the indication of the mindfulness level.

Figure 2. Confirmatory factor analysis (standardized factor loading)



Note: Obs = Observation; Des = Description; Nr = Non-reaction; Actwa = Act with awareness; Nj = Non-judging; mindfulnessobs1, mindfulnessobs2,…, etc. = refers to corresponding survey questions.

4.2. Descriptive results

The descriptive results concerning the variables of interest in the survey are presented in Table A.1. As shown in the descriptive statistics, both *mindfulness* and *employee involvement* showed a significant positive correlation with *psychological safety*. *Mindfulness* also showed a significant correlation with *employee involvement*. *Gender* as a control variable displayed a significant correlation with *mindfulness, employee involvement*, and *psychological safety*. A marginal significance was also visible in the relationship between *company size* and *psychological safety, government/national owned* company background, and *employee involvement*. *COVID-19 lockdown*, however, did not show a significant association with *psychological safety, mindfulness,* or *employee involvement*. The coefficient between the *COVID-19 lockdown* and *psychological safety* was positive, which is discussed in more detail below. Although the other control variables did not show a significant correlation with the independent variable, dependent variable, or mediator directly, significant correlations among them were found and are presented below. To further explore their influence on the subject, they are all included in the regression.

The hierarchical multiple regression results are shown in Table 1. *Mindfulness* as a predictor for *psychological safety* remained significant in all of the regressions, and the positive connection between *employee involvement* and *psychological safety* was significant as well. During step 3, with the addition of *employee involvement*, a significant increment in variance explained *psychological safety* (R^2 increased by 0.36, $p < 0.001$). The model explained 51% of the variance in psychological safety ($R^2 = 0.51$, $p < 0.001$). Strong support was found for *H1* and *H2*, calling for further investigation on the mediation effects through the structural equation model and the Sobel test. However, COVID-19 lockdown practice again showed no significant correspondence, and the coefficient was positive.

Table 1. Hierarchical multiple regression

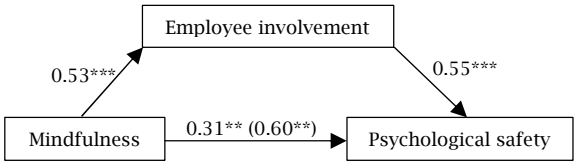
Variables	*Step 1 coefficient*	*Step 2 coefficient*	*Step 3 coefficient*	*Step 4 coefficient*
Age	-0.02	-0.01	0.00	0.00
Education	0.07	0.04	0.12	0.12
Company size	0.15 (0.07)	0.14 (0.08)	0.07	0.07
Kids	0.20	0.18	0.15	0.15
Leader	0.10	0.02	-0.12	-0.12
Gender	-0.26*	-0.15	0.01	0.02
Employment year	0.02	0.02	-0.02	-0.02
COVID-19 impacted industry	0.06	0.02	-0.01	-0.02
Government/national owned	-0.11	-0.05	0.09	0.09
Mindfulness		0.60***	0.31**	0.31**
Employee involvement			0.55***	0.55***
COVID-19 lockdown				0.05
R^2	0.06	0.15***	0.51***	0.51***
delta R^2	0.01	0.10	0.48	0.48

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001, p < 0.1 with marginal significance is marked in brackets.*

4.3. Test of mediation

A mediation test was performed in Stata via the structural equation model (SEM) and the "medsem" package (Mehmetoglu, 2018), which is based on the strategy articulated by Iacobucci et al. (2007). The SEM command in Stata involves two models for regression. The first model tests regression results of *psychological safety* on the independent variable *mindfulness*, and mediator *employee involvement*. The second model tests regression results of *employee involvement* in *mindfulness*. The "medsem" command was entered afterward for the Sobel test to check the significance of the mediation effect. Monte Carlo resampling replication is defined to be 1000; regression results for both models as well as the Sobel's test results ($p = 0.001$) are all significant. Thus, *H3* and *H4*, that *mindfulness* is positively related to *employee involvement* and that *employee involvement* partially mediates the relationship between *mindfulness* and *psychological safety,* are supported. As shown in Figure 3, when accounting for *employee involvement* related indirect effects (coefficient = 0.29, $p < 0.001$), the direct effect of *mindfulness* on *psychological safety* remained significant (coefficient = 0.31, $p < 0.01$).

Figure 3. Test of employee involvement as mediator



*Note: * p < 0.05, ** p < 0.01, *** p < 0.001, p < 0.1 with marginal significance is marked in brackets. The value represents SEM regression coefficients. The total effect of mindfulness on psychological safety is shown in parenthesis.*

4.4. Test of moderation effect of COVID-19 lockdown and moderated mediation

To test the moderation effect of the COVID-19 lockdown on the relationship between *employee involvement* and *psychological safety*, conventional multilevel regression was applied, followed by a simple slope test to examine the marginal effects. The independent variable, *employee involvement*, which is continuous in this model, was centered to allow for less biased estimates of the effects and slopes (Preacher et al., 2010; Zhang et al., 2009). However, the moderator, *COVID-19 lockdown*, was not centered as it is a binary variable. Table 2 below

shows the regression results; the whole moderation model explains 52% of the variance to *psychological safety* ($R^2 = 0.52$, $p < 0.001$). Figure 4 shows the simple slot results ($p < 0.001$). The control variable, *company size*, in the step 1 regression showed marginal significance for *psychological safety*. Nevertheless, the moderation (weaken) effect (*H5*) of the *COVID-19 lockdown* is supported.

Table 2. Test of moderation via multilevel regression

Variables	*Step 1 coefficient*	*Step 2 coefficient*	*Step 3 coefficient*	*Step 4 coefficient*
Mindfulness	0.60***	0.31**	0.31**	0.31**
Age	-0.01	0.00	0.00	-0.01
Education	0.04	0.12	0.12	0.13
Company size	0.14 (0.08)	0.07	0.07	0.08
Kids	0.18	0.15	0.15	0.16
Leader	0.02	-0.12	-0.12	-0.12
Gender	-0.15	0.01	0.02	0.03
Employment year	0.02	-0.02	-0.02	-0.02
COVID-19 impacted industry	0.02	-0.01	-0.02	0.02
Government/national owned	-0.05	0.09	0.09	0.10
Employee involvement		0.55***	0.55***	
covidlockdown			0.05	0.05
Employee involvement (centered)				0.61***
covidlockdown_ei				-0.19*
R^2	0.15***	0.51***	0.51***	0.52***
Adjusted R^2	0.10	0.48	0.48	0.48

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001, p < 0.1.*

Figure 4. Simple slot results ($p < 0.001$, $R^2 = 0.52$)

To further examine whether the moderation was supported for the entire model, moderated mediation in Stata was further tested. Specifically, how *COVID-19 lockdown* as the moderator interacts with *employee involvement* to general conditional indirect effect was further looked into. SEM code in Stata was adopted again to examine the moderated mediation with two models, one model with the mediator of *employee involvement* as the response variable and the other model with the dependent variable of *psychological safety* as the response variable (see Table 3). Then, bootstrap was run to verify the moderated mediation. As presented in Table 4, the bias-corrected confidence interval for three bootstrap point estimates concerning the indirect effect did not include zero, which indicates that moderated mediation (*H6*) is supported.

Table 3. Testing of moderated mediation

Variables	*Model 1* (Mindfulness > EI)	*Model 2* (EI > PS, Mindfulness > PS, covidlockdown > PS, covidlockdown_ei > PS)
Employee involvement		0.61***
Mindfulness	0.53***	0.31**
Age	-0.02	-0.01
Education	-0.15	0.13 (0.1)
Company size	0.12	0.08
Kids	0.06	0.16
Leader	0.25 (0.1)	-0.12
Gender	-0.30*	0.03
Employment year	0.06	-0.02
COVID-19 impacted industry	0.05	0.02
Government/national owned	-0.25	0.10
covidlockdown		0.05
covidlockdown_ei		-0.19*
var (e. ei)	0.86	
var (e. ps)	0.35	
Chi-square	69.89***	

*Note: EI = Employee involvement, PS = Psychological safety, * p < 0.05, ** p < 0.01, *** p < 0.001, p < 0.1 with marginal significance is marked in brackets.*

Table 4. Bootstrap result with 1000 replications

Level of moderator	*Coef.*	*Bias*	*95% conf. interval*		*Note*
			Low	*High*	
bs 1 (low)	0.39	-0.0014097	0.18	0.62	P
			0.18	0.62	BC
bs 2 (medium)	0.34	-0.0002773	0.15	0.52	P
			0.15	0.52	BC
bs 3 (high)	0.28	0.0008551	0.12	0.47	P
			0.13	0.48	BC

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001, p < 0.1 with marginal significance is marked in brackets; P refers to percentile and BC refers to Bias-corrected.*

5. DISCUSSION

The study explored the mechanism driving psychological safety. The study assessed mindfulness as the antecedent for psychological safety, with employee involvement as an underlying mediator, and explored how the context of the COVID-19 lockdown impacts the mechanism. In line with SDT and COR, the results of testing the moderated mediation model including these constructs supported the partial mediation of employee involvement in the relationship between mindfulness and psychological safety and indicated that this mediation was moderated by the COVID-19 lockdown. Thus, all of the six hypotheses were supported by the research.

However, surprisingly, COVID-19 lockdown showed a positive correlation with psychological safety, and individuals embedded in a low employee-involvement environment were found to have higher levels of psychological safety when experiencing severe COVID-19 lockdown as compared with less severe COVID-19 lockdown practices. This can be explained from two perspectives. First, the COVID-19 pandemic has created a new reality in which individuals are no longer confined to the traditional boundaries of team activities and the workplace (Armache et al., 2022). The shift to working from home via virtual conferences and digitalization has formed a new approach to networking and employee involvement and has impacted conventional involvement practices that require physical participation. From this perspective, low conventional employee involvement may not necessarily indicate a low involvement effect of lockdowns. Additionally, differences in mindfulness level may cause differences in the ability to navigate difficulties and changes. As Kudesia (2019) addressed: "Mindfulness helps people respond to situations with more flexibility, then this flexibility can be amplified through social interrelating to beneficially transform the organization or it can fragment interrelating in ways that erode coordination and competencies" (p. 406). From this perspective, high levels of mindfulness have an amplifying effect, enabling individuals to better process "the moment" in a more resilient and objective manner; adjust themselves to negative contexts such as COVID-19 lockdowns and maintain their PWB.

In terms of the constructs of mindfulness, two measurements from the original FFMQ-20 were discovered to have lower factor loading, considering the unique Chinese cultural context, in which the correlation between the five facets is far more complex than expected. The five facets are defined as follows. First, "making judgements" refers to the process of forming an opinion or evaluation by discerning and comparing. In Chinese, this translates to *pan ding*, whose literal meaning is "to estimate" or "to decide". It reflects a kind of mental action, specifically, mentally reacting to a certain context, both consciously and unconsciously. From a Chinese point of view, taking mental actions is considered to be a type of action as well. As a result, the survey item "in difficult situations, I can pause without immediately reacting" (Baer et al., 2006, p. 34) can be confusing for Chinese people as it is not clear whether "immediate reacting" refers to physical action or mental action. Second, influenced by thousands of years of Confucianism, Chinese society interprets "making judgements" and "self-reflection" as complex concepts. Confucianism holds that the virtuous person maintains an unyielding path toward self-betterment. Thus, evaluating others before examining oneself may be considered a sign of arrogance, as indicated in the Analects, which state, "No gentleman would ever contemplate overstepping his position" (Nylan, 2014, Chapter 14). For centuries, self-reflecting, which involves making certain judgements about one's own behavior or thoughts, was actively encouraged, while similarly evaluating others was considered to be inappropriate. Consequently, the survey item "I make judgments about whether my thoughts are good or bad" (Baer et al., 2006, p. 35) is confusing as well, as being non judging by others but making judgements of one's own thoughts and behavior could be interpreted as a positive behavior. Third, the study sample comprised non-clinical participants who did not have a full understanding of or much experience with mindfulness and, therefore, may have misinterpreted the mindfulness items, especially the items themselves imposed certain cultural misunderstandings, in turn impacting the factor loading results (Meng et al., 2020).

Furthermore, certain error correlations between describing and observing were discovered. When engaging in observing (noticing internal and external experiences and attending to them) and describing (labeling internal experiences with words) (Lilja et al., 2013), the brain focuses on the "moment", directly processing the information and context. When acting with awareness (i.e., emphasizing actions at the moment, as opposed to behaving mechanically, focusing one's attention elsewhere), non-judging (taking a non-evaluative stance towards thoughts and feelings), and non-reacting (allowing one's feelings and thoughts to come and go, without getting caught up in them) (Lilja et al., 2013; López-del-Hoyo et al., 2022), the brain interprets the moment using a regulating process to either draw the attention back or control thoughts to be non-evaluative. Therefore, it is reasonable for some of the survey items under describing to be correlated with observing, as observation is necessary for describing, especially for describing subtle feelings. This explains why the item "I'm good at finding words to describe my feelings" (Baer et al., 2006, p. 35) was found to be correlated with items measuring observing. This also explains certain negative correlations discovered between the five dimensions of mindfulness, as it reveals the greatest challenge of mindfulness, involving two types of brain processing. Specifically, self-critical people may have trouble with the task of combining (self-)

observation with self-acceptance to maintain an open and non-judgmental perspective when they note their attention flagging (Lilja et al., 2013).

A number of empirical studies have also revealed negative correlations between FFMQ facets, including Baer et al. (2006) and Lilja et al. (2011), who found that observing is negatively correlated with non-judging. In an Asian context, Sugiura et al. (2012) found that observing was negatively correlated with both acting with awareness (-0.12, $p < 0.01$) and non-judging (-0.32, $p < 0.01$). Meng et al. (2020) discovered that acting with awareness was negatively related to observing ($p < 0.01$) and that non-judging was also negatively linked with non-reacting ($p < 0.01$), observing ($p < 0.01$), and describing ($p < 0.01$). Sugiura et al. (2012) also shared that their Eastern sample placed less emphasis on their "active attitudes toward experiences", which refers to "observing and describing", focusing more on their "views and judgments", which explains the negative correlations from another cultural perspective.

6. CONCLUSION

The findings in this paper have several theoretical and practical implications. First, the research represents one of the initial efforts to explore the mechanism of predicting psychological safety with the joint effects of mindfulness and employee involvement practices. The integrated approach allows a better understanding of how both individuals and their working context interplay to drive a higher psychological safety level in the workplace. Second, the direct causal relationship discovered between mindfulness and employee involvement lays the ground for future studies to explore its mechanism and boundaries. In addition, it extends the theoretical development of SDT, COR, and mindfulness in the field of management in several ways. Specifically, mindfulness is a root construct that directly influences PWB and facilitates the internalization of employee involvement practices, creating and reinforcing a sense of connection and safety, which is vital in the workplace, as it translates structural features into behavioral outcomes (Edmondson, 1999). Furthermore, the construct of FFMQ-18 and the discoveries of both negative and error correlations between five facets of the five-factor model of mindfulness enrich the study of the subject in an Eastern context, which will support future developments in the management field. Last but not least, the findings also enrich the research on COVID-19 and the associated lockdown practices in China, an issue that has drawn extensive global attention. COVID-19 lockdown is an external regulation, which is difficult to internalize when mindfulness is low as it robs the fundamental psychological needs for networking, thereby weakening the positive relationship between employee involvement and psychological safety, whereas employee involvement is a supportive and internalized external regulation, fostering psychological safety. SDT also suggests that characteristics of both the workplace and the individual should jointly motivate employees (Deci & Ryan, 1985). The results also revealed the possibility that the correlation between the COVID-19 lockdown and psychological safety may depend on a mix of variances.

The modern business environment is uncertain, volatile, ambiguous, and complex. Today, "survival of the fittest" refers not only to physical conditions but also to mental fitness. For corporations, this highlights the importance of psychological safety issues, not only in managing business indicators but also in leveraging both intrinsic and extrinsic factors to improve both productivity and the mental health of employees. Specifically, it is crucial to implement high-involvement practices in more diversified forms with broader coverage to foster interconnection, autonomy, and participation and to raise the level of psychological safety. It is equally important for organizations to recruit individuals with personality traits associated with higher levels of psychological safety (Frazier et al., 2017), such as greater mindfulness, which directly affects psychological safety and facilitates the internalization of employee involvement practices boosting psychological safety indirectly, resulting in increased employee morale, lower turnover rates, and stronger financial performance (Riordan et al., 2005). As people can be trained in mindfulness, applying mindfulness interventions in the workplace can improve employees' levels of mindfulness. In the meantime, these mindfulness interventions also help individuals find more interest and value in their daily activities (Donald et al., 2020) and consequently enhance job satisfaction and team performance. Even for investors, grasping psychological biases through mindfulness interventions helps to avoid common mistakes and develops rational investment decisions (Hafez, 2021). Additionally, given the server psychological issues associated with COVID-19, activating both intrinsic and extrinsic motivations to improve mental health is crucial. On the national level, it is essential to encourage citizen involvement in decision-making to maintain respect for civilians' will in governance. Furthermore, leveraging fast-developing technologies to enable virtual connections and interactions would be beneficial during extreme lockdown conditions. Therefore, another area worth investigating is how activities in the virtual world could impact real-life behaviors.

Finally, although we seldom discuss the negative aspects of psychological safety, it is worth taking a cautious attitude in two main aspects. First, boards of management should be aware of the possibility that high levels of psychological safety may increase the probability of engaging in unethical behavior (Pearsall & Ellis, 2011), in that employees may perceive their organization to be non-threatening and be tempted to act in their own interest, regardless of ethical concerns. Second, with regard to the autonomy brought by higher psychological safety levels within a firm, lower levels of monitoring and, consequently, recognition (Langfred, 2004) may result in a lower level of performance than expected.

Although the study makes important contributions to the literature, it has certain limitations. First, although the sample covered a variety of industries and work experiences, the majority of the participants were alumni of two top universities in China, sharing similar, relatively higher levels of education, increasing the possibility

that they held higher-than-average positions in their organization. Therefore, the means of the majority of the variables may be skewed higher. Second, the sample of 193 observations was small. Further study involving more diversified backgrounds and a higher number of observations would add value to this research. Third, although the current study was predictive, such self-reported measurements involve certain limitations. Furthermore, all of the data were collected simultaneously from the participants, meaning that the study was not longitudinal. As such, longitudinal research is encouraged, to incorporate the changes to mindfulness and employee involvement that occur over time. Additionally, although the FFMQ-18 was constructed, a replica test was not constructed to verify its reliability with different groups of people.

Ensuring psychological safety is important, as many studies have demonstrated. It is not only influenced by organizations but also largely determined by individuals as well. By showing that mindfulness has a significant relationship with psychological safety, both directly and indirectly via employee involvement, this study offers evidence of the positive impact of mindfulness; thereby promoting the practice of mindfulness in the workplace. Only with improved individual mindfulness and effective employee involvement practices can we raise employees' psychological safety levels, thereby improving the mental health of our employees, increasing their intrinsic motivation, and creating greater autonomy at work for a more sustainable and engaging corporate environment with continuous growth.

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APPENDIX

Table A.1. Descriptive statistics, mean, standard deviation and intercorrelations

	Mean	*Standard deviation*	*Psychological safety*	*Mindfulness*	*Employee involvement*	*Age*	*Education*	*Company size*	*Kids*	*Leader*	*Gender*	*Employment year*	*COVID-19 impacted industry*	*Government/national owned*	*COVID-19 lockdown*
Psychological safety	4.11	0.86	1												
Mindfulness	3.78	0.45	0.34***	1											
Employee involvement	3.73	1.01	0.68***	0.29***	1										
Age	37.46	5.82	-0.04	-0.01	-0.05	1									
Education	3.23	0.61	0.03	0.06	-0.09	0.14*	1								
Company size	2.06	0.77	0.12 (0.09)	0.03	0.09	0.17*	0.05	1							
Kids	0.69	0.46	0.07	0.01	0.02	0.46***	0	0.06	1						
Leader	0.48	0.5	0.04	0.13 (0.09)	0.1	0.31***	0.26***	0.05	0.21***	1					
Gender	0.53	0.5	-0.14*	-0.17*	-0.17*	0.22**	0.12 (0.1)	0.06	0.08	0.22**	1				
Employment year	2.59	1.18	0.02	-0.01	0.05	0.42***	-0.06	0.25***	0.28***	0.19**	0.13 (0.06)	1			
COVID-19 impacted industry	0.26	0.44	0.02	0.07	0.07	-0.19**	-0.15*	-0.12 (0.09)	-0.16*	0.03	-0.08	-0.09	1		
Government/national owned	0.2	0.4	-0.03	-0.08	-0.12 (0.09)	-0.01	0.15*	0.05	0.02	-0.06	-0.03	0.15*	-0.03	1	
COVID-19 lockdown	0.38	0.49	0.05	0.03	0.04	-0.05	0	0	-0.01	0.03	-0.1	0.08	0.20**	0.01	1

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001, p < 0.1 with marginal significance is marked in brackets.*