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Exploring the associations of mindfulness and burnout among Chinese college L2 learners: A hybrid SEM and PNA approach

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Abstract

Although the protective role of mindfulness against academic burnout has been widely documented in general educational contexts, whether and how mindfulness functions in L2 learning settings, as well as the differential associations between specific mindfulness and burnout dimensions, remain insufficiently understood. Grounded in Conservation of Resources (COR) theory, this study employed structural equation modeling (SEM; AMOS 24.0) and psychological network analysis (PNA; R 4.5.3) to examine the relationships between three mindfulness dimensions (*Acting with awareness*, *Non-judging of experience*, and *Describing*) and three dimensions of L2 burnout (*Exhaustion*, *Cynicism*, and *Reduced efficacy*) among Chinese university L2 majors. A total of 443 participants completed the Chinese version of the Short Inventory of Mindfulness Capability and the L2 Burnout Scale. SEM results indicated that *Acting with awareness* and *Non-judging of experience* negatively predicted all three dimensions of L2 burnout, whereas *Describing* unexpectedly showed positive predictive effects. PNA further revealed that the connection between *Non-judging of experience* and *Reduced efficacy* was the only robust cross-

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cluster link between mindfulness and burnout. *Reduced efficacy* demonstrated the highest strength and bridge strength, emerging as the central node in the network, whereas *Describing* functioned as the only positive bridge node connecting the two clusters. These findings highlight the differentiated roles of mindfulness dimensions in L2 burnout and suggest that interventions should prioritize cultivating awareness and non-judgment, cautiously consider the potential risks associated with describing, and target self-efficacy enhancement as a key intervention focus.

Keywords: mindfulness, L2 burnout, L2 majors, psychological network analysis

Introduction

Second language (L2) learning research has traditionally been shaped by cognitive and motivational perspectives, with emotions receiving systematic attention only after the emergence of positive psychology (MacIntyre & Mercer, 2014). Although this "emotional turn" has expanded the research landscape, studies have primarily examined transient emotional experiences, such as enjoyment, anxiety, and boredom (Liu & Wang, 2026; Wang, 2026; Wang et al., 2021; Wang & Guo, 2026; Wang et al., 2026; Wu & Liu, 2025), while burnout as a chronic affective state remains comparatively underexplored. Unlike situational emotions, burnout reflects the cumulative effects of prolonged stress and resource depletion, emerging when individuals' cognitive and emotional resources are continuously exhausted without adequate recovery (Maslach et al., 2001). This vulnerability may be particularly salient in L2 learning, where learners encounter not only the cognitive demands of language processing but also challenges related to identity negotiation, self-expression, and cross-cultural adaptation, which may intensify resource loss (Li et al., 2024). Although prior research has identified several antecedents of L2 burnout, such as insufficient teacher support and accumulated negative emotions (Wu et al., 2025), limited attention has been devoted to factors that can preserve learners' resources and prevent burnout development.

Mindfulness is defined as the capacity to attend deliberately and nonjudgmentally to present-moment experience (Kabat-Zinn, 1982). As a malleable psychological capacity, it has been increasingly incorporated into educational research and practice because of its potential to alleviate stress and regulate emotions. Meta-analytic evidence indicates a moderate negative association between mindfulness and academic burnout in general educational contexts (Cai et al., 2025), although this literature has focused predominantly on mathematics, medical education, and general academic settings. By contrast, research on mindfulness in L2 learning remains limited and is still in its early stages (Fan & Cui, 2024; Koçali & Aşık, 2026; Mohammad Hosseini et al., 2024). Moreover, existing studies have largely conceptualized mindfulness as a unitary construct, potentially overlooking the distinct functions of its constituent dimensions. Duan and Li (2016), for instance, showed that mindfulness dimensions differ in their associations with psychological well-being: some exert adaptive effects, whereas others may yield context-dependent or even opposing effects. Treating mindfulness as a global construct may therefore mask the differential roles of its individual dimensions in the development of L2 burnout.

Building on these gaps, this study adopts Conservation of Resources (COR) theory (Hobfoll, 2001) as a theoretical framework to examine the associations between mindfulness dimensions and L2 burnout dimensions among Chinese L2 majors. COR theory posits that individuals are motivated to acquire, preserve, and protect valued resources; when resource loss persists without sufficient recovery, a loss spiral may emerge, eventually contributing to burnout. To capture both direct and interconnected relationships, this study integrates structural equation modeling (SEM) and psychological network analysis (PNA) (Xu & Wu, 2026). SEM is used to assess the unique predictive effects of mindfulness dimensions on L2 burnout, whereas PNA identifies the conditional associations among variables after controlling for other components within the system. Together, these analytical perspectives provide a more nuanced understanding of how mindfulness relates to L2 burnout and clarify the differential roles of mindfulness dimensions in mitigating burnout risk.

Literature Review

Conservation of Resources Theory as the rationale

COR theory offers a prominent framework for understanding the development of stress and burnout (Hobfoll, 2001). It posits that individuals are inherently motivated to acquire, preserve, and protect valued resources, including material resources (e.g., housing), social resources (e.g., social support), personal characteristic resources (e.g., self-efficacy), and energy resources (e.g., time and effort). A core assumption of COR theory is that actual or anticipated resource loss triggers stress responses; when resource depletion persists without adequate replenishment, individuals may enter a loss spiral that ultimately culminates in burnout. Conversely, resource accumulation can foster positive psychological states through a gain spiral. The reciprocal interplay between resources and burnout reflects this theoretical mechanism, whereby burnout accelerates resource depletion while available resources serve a protective function. Recently, COR theory has been extended to L2 research to explain the dynamic relationships between burnout and psychological constructs such as resilience and engagement (Wu, Wang, et al., 2024). Given that mindfulness constitutes a developable psychological resource with the capacity to replenish and safeguard other resources, this study adopts COR theory to investigate how different dimensions of mindfulness are associated with distinct dimensions of L2 burnout.

Burnout in second language learning

The concept of burnout was initially introduced by Freudenberger (1974) to describe the psychological and physical exhaustion experienced by social service professionals exposed to prolonged occupational demands. Later, Maslach et al. (2001) defined burnout as a psychological syndrome resulting from chronic stress, characterized by three core dimensions: *Exhaustion*, *Cynicism*, and *Reduced efficacy*. *Exhaustion* reflects feelings of emotional and physical depletion caused by sustained demands; *Cynicism* refers to detached or negative attitudes toward one's work, tasks, or others; and *Reduced efficacy* denotes diminished perceptions of personal competence and effectiveness under prolonged stress. Although originally developed

within occupational contexts, the concept of burnout has since been extended to educational settings, as students also encounter persistent academic pressures and resource demands. Extending this line of inquiry to L2 learning, Li et al. (2024) developed the Maslach Burnout Inventory–EFL Student Survey and demonstrated that L2 burnout comprises the same three dimensions. Given the unique challenges of L2 learning, including linguistic difficulties and cross-cultural adaptation demands, language learners may be particularly vulnerable to burnout.

Following the development and validation of L2 burnout measures (Li et al., 2024), research on this construct has expanded rapidly, with increasing attention directed toward its antecedents and consequences. Early investigations primarily emphasized contextual determinants, including inadequate teacher support, negative peer interactions, and unsupportive learning environments (Wu et al., 2025; Wu, Zeng, et al., 2024). Subsequent research has shifted toward learner-related factors, demonstrating that individual characteristics, such as lower resilience and darker personality traits, heighten susceptibility to burnout (Wu & Chen, 2025; Wu, Wang, et al., 2024). More recent studies have highlighted the role of emotional processes, indicating that persistent anxiety and boredom are closely linked to burnout and may contribute to its development (Ding & Wang, 2024). In terms of outcomes, accumulated evidence suggests that L2 burnout impairs learners' classroom engagement, ultimately hindering L2 achievement (Liu et al., 2025). Despite these advances, the potential role of mindfulness in mitigating L2 burnout remains largely unexplored, with no empirical studies to date directly examining their relationship. Addressing this gap is therefore essential for advancing understanding of protective factors against L2 burnout.

Mindfulness and second language burnout

Originating from the Buddhist tradition of insight meditation, mindfulness was introduced into clinical psychology by Kabat-Zinn (1982), who defined it as the awareness that emerges through paying attention to the present moment intentionally and nonjudgmentally. This conceptualization emphasizes two fundamental components: present-moment awareness and a nonjudgmental orientation toward experience. Based on this definition, Baer et al. (2006) developed the Five Facet Mindfulness Questionnaire, which includes five dimensions: *Observing*, *Describing*, *Acting with awareness*, *Non-judging of experience*, and *Non-reactivity to experience*. However, subsequent research has raised concerns regarding the validity of this structure. Specifically, *Non-reactivity to experience* demonstrated inadequate reliability and unstable factor loadings, whereas *Observing* was positively associated with psychological distress among individuals without meditation experience, suggesting that it may reflect rumination rather than adaptive mindfulness (Baer et al., 2008; Williams et al., 2014). To address these limitations, Duan and Li (2016) proposed a three-dimensional model comprising *Acting with awareness*, *Describing*, and *Non-judging of experience*. These dimensions represent trainable mindfulness capacities involving focused attention, the articulation of internal experiences, and an accepting stance toward thoughts and emotions.

Mindfulness has gained increasing attention in educational research due to its demonstrated benefits for stress reduction and emotional regulation, leading scholars to investigate its role in mitigating academic burnout. Existing evidence indicates that mindfulness is associated with burnout through multiple mechanisms. At the

direct level, Wang et al.'s (2024) systematic review has reported a significant negative relationship between mindfulness and academic burnout, a finding further supported by Cai et al. (2025), whose meta-analysis revealed a moderate negative association between the two constructs and a significant link with the exhaustion dimension. Beyond this direct effect, mindfulness may alleviate burnout by strengthening internal psychological resources, including self-efficacy (Xu et al., 2022) and resilience (Liu et al., 2024), as well as by enhancing perceived external resources, such as social and teacher support (Wen et al., 2023), and reducing academic stress (Chen & Qi, 2025). Despite these advances, research has been conducted predominantly in general educational contexts, with limited attention to L2 learning environments. Consequently, the relationship between mindfulness and L2 burnout remains underexplored, particularly regarding the differential roles of specific mindfulness dimensions in relation to distinct burnout dimensions. Addressing this gap, this study draws on COR theory and integrates SEM and PNA to examine the following questions:

> **RQ1:** How do different mindfulness dimensions predict different L2 burnout dimensions?
>
> **RQ2:** How are mindfulness and L2 burnout dimensions interconnected within a network?

Methods

Participants

A convenience sampling method was employed to recruit participants through the online survey platform Wenjuanxing. Data were collected from L2 majors at two universities in Henan and Hunan Provinces, China. Although non-L2 majors also receive English instruction, L2 majors typically experience more intensive and prolonged language learning, making them a more appropriate population for investigating L2 burnout, which develops through sustained academic stress. A total of 463 responses were collected. After excluding 20 invalid responses that failed the attention checks, 443 valid responses were retained.

The final sample included 74 males (16.7%) and 369 females (83.3%). The gender imbalance reflects the broader demographic characteristics of L2 majors in Chinese higher education, where female students substantially outnumber male students. Ethical approval was obtained from the researchers' affiliated institution. Participants were informed of the study purpose, procedures, confidentiality measures, and their right to withdraw at any time. Informed consent was obtained prior to questionnaire completion. Detailed demographic information is presented in Table 1.

Table 1. *Demographic characteristics of participants.*

Variable	Category	Count	Percentage
Gender	Male	89	20.1%
	Female	354	79.9%
Age	18–20	261	58.9%
	21–25	179	40.4%
	>26	3	0.7%
Major	English	290	65.5%
	Japanese	113	25.5%
	Russian	40	9.0%
Grade	Freshman	32	7.2%
	Sophomore	136	30.7%
	Junior	262	59.1%
	Senior	13	2.9%

Instruments

Short Inventory of Mindfulness Capability

Mindfulness was assessed using the Short Inventory of Mindfulness Capability (Duan & Li, 2016), a 12-item scale comprising three dimensions: Describing, Acting with awareness, and Non-judging of experience. Each dimension contains four items rated on a six-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree), with higher scores reflecting greater mindfulness capability. In our study, the three dimensions demonstrated acceptable internal consistency, with Cronbach's α of 0.723, 0.761, and 0.825, respectively.

Maslach Burnout Inventory-L2 Student Survey

L2 burnout was assessed using the Maslach Burnout Inventory–L2 Student Survey developed and validated by Li et al. (2024). The scale consists of 10 items across three dimensions: Exhaustion (four items), Cynicism (three items), and Reduced efficacy (three items). Participants rated each item on a six-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree), with higher scores indicating greater L2 burnout. In our study, the three dimensions demonstrated excellent internal consistency, with Cronbach's αof 0.948, 0.885, and 0.881, respectively.

Data analysis

Data analyses were conducted using SPSS 26.0, AMOS 24.0, and R 4.5.3, including descriptive statistics, correlation analysis, SEM, and network analysis. First, SPSS 26.0 was used to calculate the means, standard deviations, skewness, and kurtosis of the three mindfulness dimensions (*Acting with awareness, Non-judging of experience, and Describing*) and the three L2 burnout dimensions (*Exhaustion, Cynicism, and Reduced efficacy*) to examine data distribution characteristics (Kline, 2016). Pearson correlation analyses were then performed to assess the linear associations among variables and provide preliminary evidence for subsequent analyses. Second, a

manifest-variable SEM was constructed in AMOS 24.0 to examine the predictive effects of mindfulness dimensions on L2 burnout dimensions.

PNA was conducted in R using the qgraph package. A regularized partial correlation network was estimated using LASSO regularization and the Extended Bayesian Information Criterion (EBIC) approach (Epskamp et al., 2018), in which nodes represented mindfulness and L2 burnout dimensions, and edges represented partial correlations after controlling for all other variables. Nonparametric bootstrap procedures were applied to estimate 95% confidence intervals for edge weights and evaluate network stability. Node centrality indices, including strength and expected influence, as well as bridge centrality indices, including bridge strength and bridge expected influence, were calculated to identify influential components within the network (Jones et al., 2021).

Results

Findings from SEM

Prior to conducting SEM, descriptive statistics were calculated for all variables (see Table 2). Among the three mindfulness dimensions, Describing showed the highest mean score (M = 3.83, SD = 0.96), followed by *Acting with awareness* (M = 3.70, SD = 0.74) and *Non-judging of experience* (M = 3.59, SD = 0.73). Regarding the three dimensions of L2 burnout, *Reduced efficacy* demonstrated the lowest mean score (M = 2.45, SD = 1.14), whereas both *Exhaustion* and *Cynicism* had a mean score of 2.67. The skewness and kurtosis values for all variables fell within acceptable ranges, indicating that the data approximately met the assumption of normality.

Table 2. *Descriptive statistics of all variables.*

Variable	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Acting with awareness	1.50	6.00	3.70	0.74	0.064	0.485
Nonjudging of inner experience	1.00	6.00	3.59	0.73	0.112	1.260
Describing	1.00	6.00	3.83	0.96	-0.706	1.382
Exhaustion	1.00	6.00	2.67	1.27	0.550	-0.131
Cynicism	1.00	6.00	2.67	1.25	0.347	-0.498
Reduced efficacy	1.00	6.00	2.45	1.14	0.621	0.289

The correlation matrix (see Table 3) indicated that *Acting with awareness* and *Non-judging of experience* were significantly and negatively associated with all three dimensions of L2 burnout ($r = -0.110$ to -0.309). Among these associations, the strongest negative correlation was observed between *Non-judging of experience* and *Reduced efficacy* ($r = -0.309$, $p < 0.01$). Notably, *Describing* was not significantly correlated with *Exhaustion* (r = 0.090, $p > 0.05$) or *Reduced efficacy* ($r = 0.072$, $p > 0.05$), but showed a weak positive correlation with *Cynicism* ($r = 0.126$, $p < 0.01$).

Table 3. *Correlations between all variables.*

Variable	1	2	3	4	5	6
1. Acting with awareness	—					
2. Nonjudging of inner experience	0.371**	—				
3. Describing	0.589**	0.249**	—			
4. Exhaustion	-0.179**	-0.240**	0.090	—		
5. Cynicism	-0.110*	-0.244**	0.126**	0.809**	—	
6. Reduced efficacy	-0.182**	-0.309**	0.072	0.787**	0.810**	—

Note. $p < 0.05$, $p < 0.01$

To further examine the unique predictive effects of mindfulness dimensions on L2 burnout and address **RQ1**, a manifest-variable structural equation model was constructed (see Figure 1). As shown in Table 4, after controlling for the effects of other mindfulness dimensions, *Acting with awareness* significantly and negatively predicted all three dimensions of L2 burnout, including *Exhaustion* ($\beta = -0.283$, $p < 0.001$), *Cynicism* ($\beta = -0.197$, $p < 0.001$), and *Reduced efficacy* ($\beta = -0.244$, $p < 0.001$). Similarly, *Non-judging of experience* demonstrated significant negative predictive effects on all three burnout dimensions ($\beta = -0.213$ to -0.290, all ps < 0.001), with the strongest effect observed for *Reduced efficacy*.

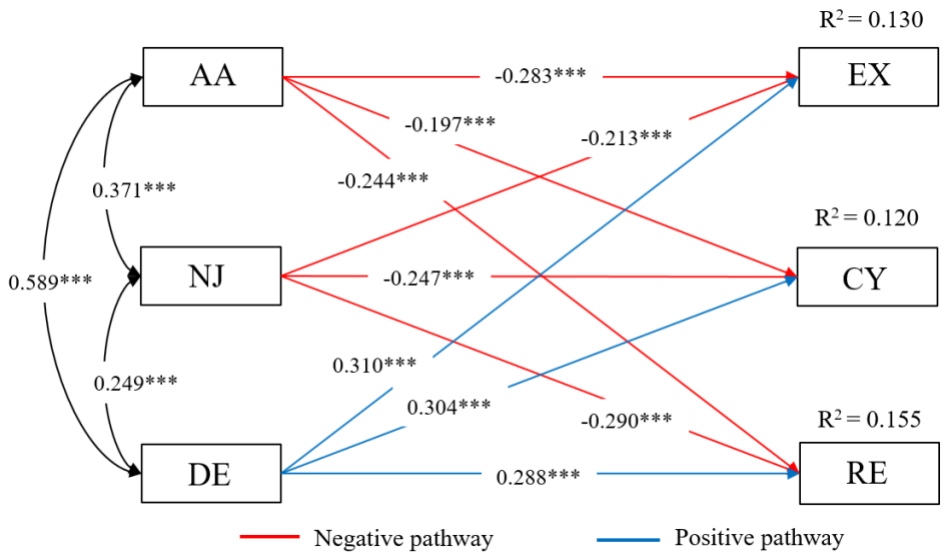


Figure 1. *Effect of mindfulness on L2 burnout.*
Note. AA = Acting with awareness; NJ = Non-judging of experience; DE = Describing; EX = Exhaustion; CY = Cynicism; RE = Reduced efficacy.

Table 4. *Pathways from mindfulness to L2 burnout.*

Pathway	B	β	SE	*p*
Acting with awareness → Exhaustion	-0.481	-0.283	0.098	< 0.001
Acting with awareness → Cynicism	-0.330	-0.197	0.097	< 0.001
Acting with awareness → Reduced efficacy	-0.373	-0.244	0.086	< 0.001
Non-judging of experience → Exhaustion	-0.371	-0.213	0.083	< 0.001
Non-judging of experience → Cynicism	-0.424	-0.247	0.082	< 0.001
Non-judging of experience → Reduced efficacy	-0.453	-0.290	0.074	< 0.001
Describing → Exhaustion	0.409	0.310	0.072	< 0.001
Describing → Cynicism	0.394	0.304	0.072	< 0.001
Describing → Reduced efficacy	0.341	0.288	0.064	< 0.001

Findings from PNA

As shown in Figure 2, a regularized partial correlation network comprising six nodes was constructed to address RQ2, including the three dimensions of mindfulness and the three dimensions of L2 burnout. Among the 15 possible edges, 10 non-zero edges remained after LASSO regularization. The estimated network showed a density of 66.7% and a mean absolute edge weight of 0.147, suggesting that the dimensions of mindfulness and L2 burnout formed a highly interconnected system.

Bootstrap 95% confidence intervals indicated that six non-zero edges were significantly different from zero. Within the mindfulness cluster, the strongest positive association was observed between *Acting with awareness* and *Describing* (edge weight = 0.562, 95% CI [0.473, 0.634]), followed by the association between *Acting with awareness* and *Non-judging of experience* (edge weight = 0.216, 95% CI [0.106, 0.316]). Within the L2 burnout cluster, all three dimensions exhibited significant positive associations. The strongest edge was found between *Cynicism* and *Reduced efficacy* (edge weight = 0.466, 95% CI [0.368, 0.548]), followed closely by the associations between *Exhaustion* and *Cynicism* (edge weight = 0.464, 95% CI [0.354, 0.566]) and between *Exhaustion* and *Reduced efficacy* (edge weight = 0.368, 95% CI [0.261, 0.460]).

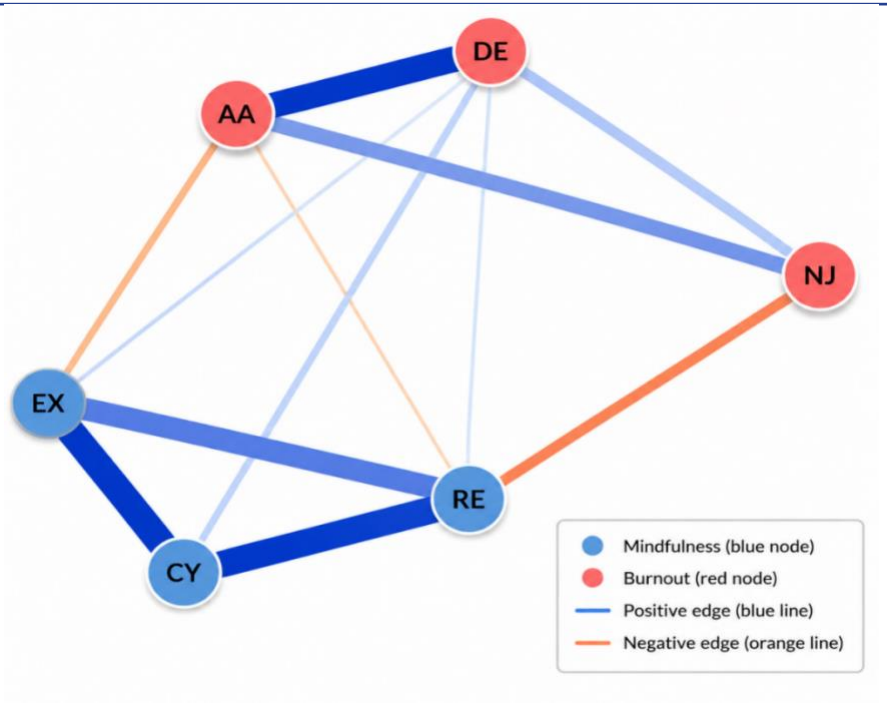


Figure 2. *Structure of the estimated network.*

Regarding cross-cluster associations, *Non-judging of experience* showed a significant negative association with *Reduced efficacy* (edge weight = −0.151, 95% CI [−0.226, −0.051]), representing the only robust connection between the mindfulness and L2 burnout clusters. This finding suggests that an accepting attitude toward internal experiences is reliably associated with higher perceived efficacy among L2 learners. In contrast, other cross-cluster edges, such as the associations between *Acting with awareness* and *Exhaustion* (edge weight = −0.092, 95% CI [−0.214, 0.000]) and between *Describing* and *Exhaustion* (edge weight = 0.055, 95% CI [0.000, 0.150]), had confidence intervals overlapping with zero, indicating that these associations lacked sufficient statistical robustness.

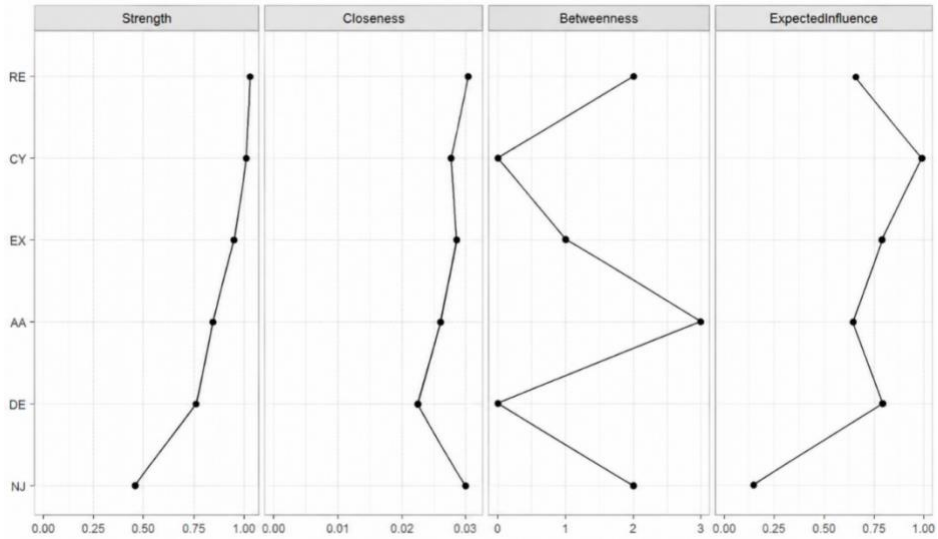


Figure 3. *Centrality plot.*

Centrality analysis further revealed the structural roles of each dimension within the network (see Figure 3). *Reduced efficacy* showed the highest strength (1.038), followed by *Cynicism* (1.020) and *Exhaustion* (0.979), indicating their central positions in the network. Among mindfulness dimensions, *Acting with awareness* (0.905) and *Describing* (0.811) were relatively central, whereas *Non-judging of experience* (0.472) was more peripheral. For expected influence, *Cynicism* showed the highest value (1.000), followed by *Describing* (0.811) and *Reduced efficacy* (0.666). Although *Acting with awareness* exhibited the highest betweenness (3), and *Non-judging of experience* and *Reduced efficacy* showed higher closeness values (0.028), these indices were interpreted cautiously due to their limited stability in small networks.

Bridge centrality analysis was conducted to identify key nodes connecting the mindfulness and L2 burnout clusters. As shown in Figure 4, Bridge Expected Influence (1-step) revealed differentiated roles across nodes. Describing showed the only positive bridge expected influence (+0.154), suggesting its unique role as a positive connector between the two clusters. *Cynicism* also demonstrated a positive bridge effect (+0.070), whereas *Exhaustion* (−0.037), *Acting with awareness* (−0.128), *Non-judging of experience* (−0.161), and *Reduced efficacy* (−0.167) showed negative values, indicating potential buffering roles through negative cross-cluster associations.

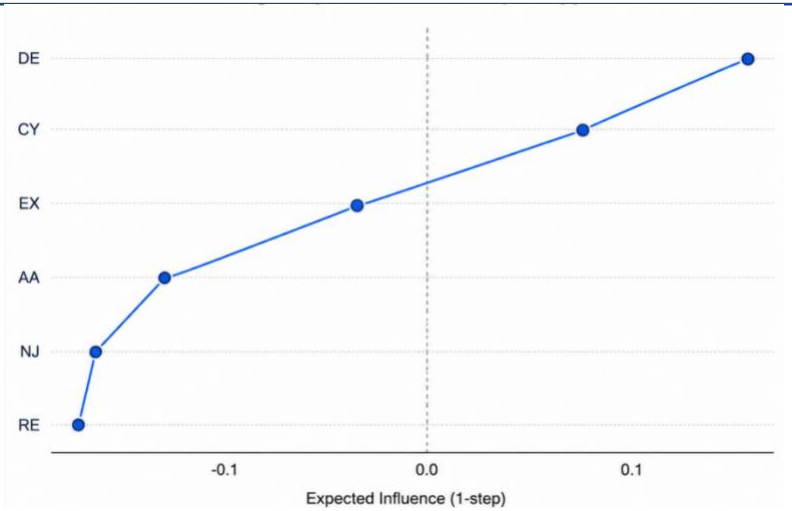


Figure 4. *Expected impacts of bridges.*

Additionally, Bridge Strength analysis showed that *Reduced efficacy* had the highest bridge strength (0.205), followed by *Non-judging of experience* (0.161), indicating their relatively prominent roles in connecting the two clusters. This pattern suggests that while *Reduced efficacy* serves as the most active connector in terms of structural links, *Describing* plays a distinctive role in the directionality of cross-cluster influence.

Finally, network stability analyses (see Figures 5) indicated satisfactory robustness of the estimated network. The CS-coefficient for centrality indices was 0.673, and the correlation stability coefficient for edge weights was 0.749, both exceeding the recommended threshold of 0.50.

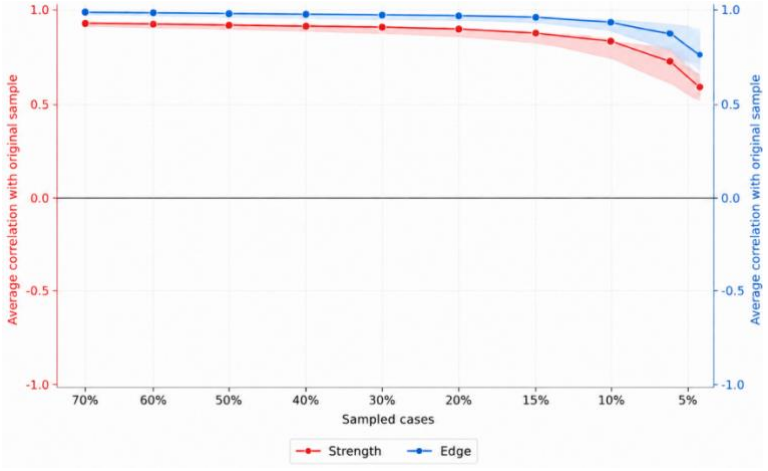


Figure 5. *Stability of centrality indices and edge weights.*

Discussion

Grounded in COR theory (Hobfoll, 2001), this study integrated SEM and PNA to systematically examine the relationships between three mindfulness dimensions and three dimensions of L2 burnout. The findings not only revealed differentiated predictive effects of mindfulness dimensions on L2 burnout but also uncovered the complex relational structure underlying these constructs.

Regarding **RQ1**, SEM results demonstrated that *Acting with awareness* and *Non-judging of experience* significantly and negatively predicted all three dimensions of L2 burnout. This finding is consistent with previous research in general educational contexts showing that mindfulness is negatively associated with academic burnout (Cai et al., 2025; Wang et al., 2024), while extending this protective effect to L2 learning contexts. Previous studies have similarly highlighted the adaptive functions of these two dimensions. Martínez-Rubio et al. (2020) found that *Acting with awareness* and *Non-judging of experience* were particularly strong predictors of perceived stress among university students. Moreover, Kinnunen et al. (2020), using a longitudinal intervention design, demonstrated that *Non-judging of experience* played a stable role in reducing burnout, remaining the only mindfulness dimension that consistently mediated changes across all three burnout dimensions at the 10-month follow-up. From the perspective of COR theory, *Acting with awareness* and non-judging represent two important psychological resources. *Acting with awareness* helps individuals maintain attention on current tasks and prevents unnecessary depletion of cognitive resources caused by distraction or anxiety, whereas *Non-judging of experience* reduces resource loss arising from negative self-evaluation. In demanding L2 learning environments, these capacities may therefore weaken the resource loss spiral associated with burnout development.

However, contrary to expectations, *Describing* positively predicted all three dimensions of L2 burnout. This finding differs from previous meta-analytic evidence suggesting an overall negative relationship between mindfulness and academic burnout (Cai et al., 2025). Nevertheless, previous studies have also reported inconsistent effects of *Describing* across contexts. Carmody and Baer (2008), for example, found that changes in *Describing* during mindfulness-based stress reduction were not significantly associated with changes in psychological symptoms, perceived stress, or well-being. Similarly, Kinnunen et al. (2020) found that *Describing* only served as an additional mediator during the intervention period, whereas its effects were less stable than those of *Non-judging of experience* during follow-up. These findings suggest that *Describing* may not represent an inherently adaptive mindfulness component. Similar to concerns regarding the observing dimension among non-meditators (Baer et al., 2008), describing may sometimes reflect excessive cognitive elaboration rather than effective emotional processing. In L2 learning contexts, repeatedly verbalizing language difficulties and perceived inadequacies without an accompanying accepting attitude may reinforce negative self-perceptions and amplify burnout experiences.

Regarding **RQ2**, PNA further clarified the associations among mindfulness and L2 burnout dimensions beyond the predictive relationships identified by SEM. At the cross-cluster level, *Non-judging of experience* and *Reduced efficacy* formed the only robust negative connection between the mindfulness and burnout networks. Interestingly, the negative association between *Acting with awareness* and

Exhaustion identified in SEM did not remain significant in the network model after controlling for other dimensions. This suggests that when the shared variance among mindfulness components is considered, non-judging rather than acting with awareness may represent the most direct protective factor associated with maintaining L2 self-efficacy. This finding is consistent with Kinnunen et al. (2020), who showed that *Non-judging of experience* was the most stable mindfulness dimension in explaining burnout reduction. From a COR perspective, non-judging may directly protect learners' self-evaluative resources by preventing language errors and performance difficulties from being interpreted as evidence of personal inadequacy.

The role of *Describing* further highlights the importance of examining mindfulness as a multidimensional construct. Although *Describing* showed positive predictive effects on burnout in SEM, it did not demonstrate significant direct cross-cluster connections in the network analysis. Instead, bridge analysis identified describing as the only node with positive bridge expected influence. This indicates that *Describing* may not directly contribute to burnout but may influence the broader system through its interactions with other mindfulness dimensions. One possible explanation is that describing reflects a double-edged process in L2 learning. On the one hand, accurately identifying and articulating internal experiences may facilitate self-awareness; on the other hand, when such awareness is not accompanied by acceptance, it may increase attention to linguistic difficulties and negative self-evaluations. Thus, the function of *Describing* may depend on whether it operates together with other adaptive mindfulness capacities, particularly *Non-judging of experience*. This interpretation is also supported by Kinnunen et al. (2020), who found that describing showed temporary mediating effects during intervention but lacked the long-term stability demonstrated by *Non-judging of experience*.

Centrality analysis further revealed that Reduced efficacy occupied the most central position in the network, showing the highest strength and bridge strength. This finding suggests that self-efficacy may represent a key mechanism connecting mindfulness and L2 burnout. Previous research provides converging evidence for this interpretation. Yan et al. (2025), using network analysis, found that self-efficacy was the most central bridge node linking mindfulness-related factors and burnout among preschool teachers. Similarly, Xu et al. (2022) demonstrated that L2 self-efficacy mediated the relationship between learning stress and L2 burnout. From the COR perspective, *Reduced efficacy* represents both an outcome of resource depletion and a potential driver of further resource loss. When learners perceive themselves as lacking competence in L2 learning, such negative self-appraisals may accelerate psychological resource depletion and reinforce the burnout cycle. Therefore, interventions targeting L2 self-efficacy may provide an effective pathway for interrupting the resource loss spiral and facilitating resource gain.

Implications and limitations

The theoretical contributions of this study are threefold. First, this study extends research on the protective role of mindfulness from general educational contexts to L2 learning environments and, drawing on COR theory, reveals the differentiated functions of mindfulness dimensions in relation to L2 burnout. Unlike previous studies that have largely conceptualized mindfulness as a unitary construct, our

findings demonstrate that *Acting with awareness* and *Non-judging of experience* may serve as resource-protective capacities, whereas *Describing* may have a more complex role depending on contextual conditions. This finding suggests that, in emotionally demanding L2 learning contexts, the specific characteristics of psychological resources may be more important than the overall amount of resources available in predicting burnout vulnerability. Second, PNA further revealed that *Non-judging of experience* and *Reduced efficacy* constituted the only robust connection between the mindfulness and burnout clusters, while *Reduced efficacy* emerged as the most central node in the overall network. This pattern suggests a potential resource cascade process, whereby *Non-judging of experience* may help preserve learners' self-evaluative resources, and the maintenance of self-efficacy may subsequently alleviate the accumulation of burnout symptoms. Finally, the inconsistent role of *Describing* across SEM and PNA highlights the necessity of employing complementary analytical approaches. Rather than replacing one another, SEM and PNA provide distinct yet complementary perspectives, together offering a more comprehensive understanding of the complex relationship between mindfulness and L2 burnout.

The findings also carry several educational implications. First, given that *Acting with awareness* and *Non-judging of experience* significantly predicted lower levels of L2 burnout, mindfulness-based interventions in L2 classrooms should incorporate dimension-specific practices. For example, brief attention-training exercises, such as one- to two-minute focused breathing activities before class, may help learners maintain attention on current learning tasks. Meanwhile, teachers may foster a non-judgmental attitude by encouraging students to view L2 errors as natural elements of the learning process rather than as evidence of insufficient ability. Second, because *Reduced efficacy* emerged as a central node linking mindfulness and L2 burnout, enhancing learners' L2 self-efficacy may represent a key intervention target. Teachers can strengthen students' confidence through constructive feedback, appropriately challenging stepwise goals, and progress-oriented evaluation, thereby helping learners conserve psychological resources and reduce burnout vulnerability. Furthermore, the positive predictive effect of *Describing* on burnout in SEM suggests that encouraging learners to frequently verbalize their learning difficulties should be approached cautiously. Particularly in the absence of a non-judgmental attitude, excessive attention to and verbalization of perceived Ll2 deficiencies may intensify anxiety, frustration, and negative self-evaluations.

Several limitations should be acknowledged. First, the cross-sectional design prevents causal inferences regarding the relationship between mindfulness and L2 burnout. Although SEM revealed predictive associations between mindfulness dimensions and burnout, reverse relationships may also exist; for example, learners experiencing higher burnout may have greater difficulty maintaining mindful awareness and acceptance. Future research should employ longitudinal designs or experience sampling methods to examine the dynamic interplay between mindfulness and burnout and to further test the resource loss and gain spirals proposed by COR theory. Second, the sample was limited to L2 majors from two universities in China, which may restrict the generalizability of the findings. Future studies should include learners from diverse academic backgrounds, educational levels, and geographical regions to examine whether the observed patterns can be replicated across populations. Third, this study relied exclusively on self-report

measures, which may be influenced by social desirability bias and common method variance. Future research could incorporate multiple sources of data, including peer or teacher evaluations, behavioral observations, and physiological indicators (e.g., cortisol levels and heart rate variability), to enhance the robustness of the findings.

Conclusion

Grounded in COR theory, this study employed SEM and PNA to examine the relationships between three dimensions of mindfulness and three dimensions of L2 burnout among Chinese L2 majors. The findings revealed that *Acting with awareness* and *Non-judging of experience* significantly and negatively predicted all dimensions of L2 burnout, whereas *Describing* showed positive predictive effects, highlighting the differentiated functions of mindfulness dimensions in L2 learning contexts. Network analysis further demonstrated that the association between *Non-judging of experience* and *Reduced efficacy* was the only robust cross-cluster connection between mindfulness and burnout, with *Reduced efficacy* emerging as the most central node in the network. Meanwhile, *Describing* occupied a unique role as a positive connector within the system. These findings advance understanding of the multidimensional mechanisms linking mindfulness and L2 burnout and provide empirical implications for developing mindfulness-based interventions targeting L2 burnout.

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