

Dispositional Mindfulness and Past-Negative Time Perspective: The Differential Mediation Effects of Resilience and Inner Peace in Meditators and Non-Meditators

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Purpose: Past-negative time perspective (PNTP) can affect our everyday lives and is associated with negative emotions, unhealthy behaviors, rumination, anxiety, depression, and post-traumatic stress disorder (PTSD). Dispositional mindfulness may be able to reduce the negative effects of PNTP; however, few studies have investigated their relationship. Thus, the purpose of this study was to explore the effect dispositional mindfulness has on PNTP, as well as the mediating role of resilience and inner peace in this regard.

Methods: This study investigated the cross-sectional relationship between self-reported mindfulness, resilience, inner peace, and PNTP. In order to further explore the relationship between mindfulness and PNTP, this study specially selected and analyzed the samples of 185 meditators and 181 non-meditators.

Results: Correlation analysis revealed that mindfulness is significantly positively correlated with resilience and inner peace. Conversely, PNTP is significantly negatively correlated with mindfulness, resilience, and inner peace. Structural equation model analysis revealed that resilience and inner peace partially mediated the relationship between mindfulness and PNTP. Furthermore, a multi-group analysis showed that the mediating effects are different between meditators and non-meditators. For meditators, the effect of mindfulness on PNTP was fully mediated by resilience and inner peace. For non-meditators, the effect of mindfulness on PNTP was only partially mediated by resilience and inner peace.

Conclusion: Based on the significant differences between the mediational models of meditators and non-meditators, we believe that dispositional mindfulness can negatively predict PNTP, and practicing meditation consistently improves dispositional mindfulness, resilience and inner peace and effectively reduces PNTP. Our findings indicate that a combination of mindfulness and PNTP could be used to design new psychological interventions to reduce the symptoms of mental health concerns such as negative bias, rumination, depression, anxiety, and PTSD.

Keywords: psychological intervention, resilience, meditation, past-negative time perspective, unhealthy behaviors, inner peace

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Introduction

Past-negative time perspective (PNTP) describes a generally pessimistic, negative, or aversive view and attitude toward the past.¹ Due to the reconstructive nature of past experiences, these negative views and attitudes may be due to actual experiences of unpleasant or traumatic past events, negative reconstruction of benign past

events, or a mix of both. Several studies have shown that PNTP is positively associated with neuroticism,² and anxiety,¹ but is negatively associated with emotional stability,¹ self-esteem,³ and subjective wellbeing.^{3,4}

Although PNTP can affect routine cognitive and behavioral decisions, in general, the negative impact PNTP can have on one's life is controllable. However, some people with high PNTP are prone to engage in unhealthy behaviors that have a negative impact on their lives, such as excessive drinking or Internet addiction.^{5,6} Furthermore, some people who experienced negative or traumatic events may even "get stuck in the past," increasing the likelihood they will develop symptoms of post-traumatic stress disorder (PTSD),^{7,8} and depression.^{9,10}

Several recent studies have identified a negative association between dispositional mindfulness and PNTP.^{3,4,11} People with high dispositional mindfulness generally display less PNTP.¹² Generally speaking, mindfulness is considered to be nonjudgmental acceptance of and nonreactive awareness to internal and external stimuli, including emotions, cognitions, and sensory input, as experienced in the present moment.^{13,14} Dispositional mindfulness is considered to be a psychological trait, and describes one's tendency to be mindful in everyday life.¹⁴⁻¹⁶ In recent decades, mindfulness meditation has received a great deal of application and research, these studies have shown that for clinical patients and healthy people alike, mindfulness training can significantly improve both physical and mental health, as well as promote overall psychological wellbeing. We posit that dispositional mindfulness may not only be negatively correlated with PNTP, but may also negatively predict PNTP. While PNTP reflects an orientation of attention toward the past with a pessimistic and negative attitude,¹ mindfulness reflects an orientation of attention toward the present with a neutral and compassionate attitude.^{12,17} Mindfulness involves maintaining a conscious awareness of the present moment, which can adjust one's attention to time, improve one's attitude toward time, and make one's perspective of time more flexible. Thus, we propose hypothesis one: dispositional mindfulness can affect PNTP.

We posit that mindfulness can not only negatively affect PNTP directly, but also may negatively affect PNTP indirectly through resilience. Resilience is a psychological trait that helps individuals who have experienced adversity and trauma adjust and develop during trying circumstances,¹⁵ thus encouraging successful coping through "self-righting".^{18,19} It is a protective factor and developmental asset that can help people improve their subjective wellbeing.¹⁸ Studies have shown that

dispositional mindfulness can be a significant predictor of resilience.^{15,20} Some previous studies have found that both dispositional mindfulness and resilience can effectively reduce the symptoms of mental health concerns such as negative bias,^{21,22} rumination,^{14,23} depression,^{13,24,25} anxiety,^{13,26} and PTSD.^{19,25} The IAA model of mindfulness suggests that mindfulness can enhance self-regulation and increase cognitive, emotional and behavioral flexibility,^{25,27} which may increase resilience and enhance adaptive coping to stressful events.²⁰ Mindfulness and resilience can reduce these negative symptoms, thereby also reducing PNTP. Thus, we propose hypothesis two: resilience plays a mediating role in the relationship between dispositional mindfulness and PNTP.

In addition to resilience, we also believe that inner peace can play a mediating role in the relationship between dispositional mindfulness and PNTP. First of all, Xu et al²⁸ consider inner peace, a relatively mild positive emotion, to represent calmness and harmony in the mind. Inner peace was found to significantly decrease symptoms of depression and anxiety; therefore, psychology researchers usually regard inner peace as an important indicator of mental health.²⁹ Lee et al²⁹ further found that compared to Americans, Chinese individuals scored higher on scales used to measure inner peace. This indicates that in Chinese culture, individuals are more focused on inner peace as a core principle in the pursuit of emotional wellbeing. Xu et al²⁸ also identified "peace of mind," as understood in Chinese culture, to be a main component of the Eastern cultural concept of subjective wellbeing. Secondly, in ancient Buddhism, achieving inner peace is the core goal of meditation.³⁰ Empirical studies have shown that inner peace remains an important goal in contemporary meditation as well.^{31,32} Recent studies have demonstrated that dispositional mindfulness is also a significant predictor of experiencing inner peace.²⁸ Meditation's fourfold model of well-being suggests that mindfulness can improve an individual's ability to regulate emotions.³³ Mindfulness encourages facing one's own experiences with acceptance and a non-judgmental attitude in the moment. When a person non-judgmentally accepts him/herself instead of blaming or criticizing his/her feelings, emotions, and thoughts, it becomes easier to maintain and enhance emotional balance and inner peace.^{28,31} According to the broaden-and-build theory of positive emotions,³⁴ positive emotions can broaden the scope of cognition, enhance cognitive flexibility, and promote effective problem solving. It is speculated that inner peace could help people reduce negative cognition and increase positive emotions, which

could consequently encourage individuals to develop a more flexible view of life and time, thereby reducing PNTP. Thus, we propose hypotheses three: inner peace plays a mediating role in the relationship between dispositional mindfulness and PNTP.

In addition, recent research has found that dispositional mindfulness not only directly affects inner peace but also indirectly affects inner peace through self-acceptance.²⁸ Recent studies have provided evidence that individuals with high resilience also experience more equanimity and peacefulness when facing stressful events.²⁰ We believe that mindfulness can also cultivate and improve inner peace through resilience. Mindfulness can improve resilience, and resilience may improve inner peace by improving emotional regulation and cognitive flexibility.^{20,25} Thus, we propose hypotheses four: resilience and inner peace plays a serial mediating role in the relationship between mindfulness and PNTP.

At last, Pepping et al³⁵ found that experienced meditators have significantly higher levels of dispositional mindfulness than inexperienced meditators. Wittmann et al³⁶ found that the PNTP scores in a long-term meditator group was significantly lower than in the control group (non-meditators). In addition, Liu et al³¹ found that eight weeks of mindfulness training led to a significant increase in scores for mindfulness and inner peace in the meditation group, compared with the control group (non-mindfulness intervention). After a brief mindfulness training, the mindfulness and resilience of the participants were significantly improved.³⁷ Since these variables may be different between meditators and non-meditators in the present study. Thus, we propose hypothesis five: the serial mediating role of resilience and inner peace affecting dispositional mindfulness and PNTP may be different in meditators and non-meditators.

Materials and Methods

Participants

In total, questionnaires were distributed to 416 participants in the meditator group and the working population through an Internet platform; however, due to incomplete information about meditation practice, data of 50 participants were excluded from analysis. Thus, a total of 366 individuals (152 female; 214 male) completed the questionnaire and were included in the final study sample. The final analysis sample had an overall age range of 18 to 55 years with a mean age of 33.71 years ($SD = 7.81$). The education level of the

sample was generally high, with 81.15% of the participants having completed university studies. Of the participants, 185 (75 female; 110 male) regularly engaged in meditation and had an overall age range of 18 to 55 years, with a mean age of 34.41 years ($SD = 8.07$). The other participants were 181 individuals (77 female; 104 male) who had never regularly meditated (although they may have tried it once or on a few occasions) and had an overall age range of 19 to 54 years, with a mean age of 32.99 years ($SD = 7.49$).

Procedure

The present study was approved by the ethics committee of the Faculty of Psychology at Southwest University, China. All participants gave online informed consent before completing the questionnaire. Respondents were told that the questionnaire was entirely anonymous, and that they would receive feedback regarding their results.

Measures

Meditation Experience Information

Meditation experience was assessed with a brief questionnaire designed by Baer et al.³⁸ Among the regular meditators, mean lifetime duration of meditation practice was 616.51 hours ($SD = 845.294$), and ranged among participants from 20 hours to 3000 hours. More than half (55.68%) reported meditating more than three times per week. Meditation practice was defined broadly, and included Vipassana meditation, loving kindness meditation, walking meditation, and yoga.

Measurement of Dispositional Mindfulness

Dispositional mindfulness was measured using the Chinese version of the Mindful Attention Awareness Scale (MAAS).³⁹ The MAAS consists of one dimension and 15 items rated on a 6-point scale ranging from 1 (“almost always”) to 6 (“almost never”). Previous research found that the MAAS has good reliability and validity.³⁹ In the present study, the reliability coefficient of the whole scale was 0.88.

Measurement of Resilience

Resilience was assessed using the Chinese version of the Connor-Davidson Resilience Scale (CD-RISC), as translated and revised by Yu and Zhang.⁴⁰ The CD-RISC contains 25 items and divides resilience into three dimensions: fortitude, self-improvement, and optimism. The CD-RISC rates each item on a 5-point scale ranging from 0 (“not true at all”) to 5 (“true nearly all of the time”), with higher scores reflecting greater resilience. The Chinese version of

the CD-RISC has been shown to have good reliability and validity.⁴⁰ In the present study, the reliability coefficient of the whole scale was 0.90, and the reliability coefficients for the subscales were 0.84 for fortitude, 0.70 for self-improvement, and 0.63 for optimism.

Measurement of Inner Peace

The Peace of Mind Scale (PoM) was used to measure peace of mind.²⁹ It comprises a total of 7 items rated on a 5-point scale ranging from 1 (“not at all”) to 5 (“all of the time”). Previous research found that the PoM has good reliability and validity.²⁹ Cronbach’s alpha in the present study was 0.89.

Measurement of Past-Negative Time Perspective

PNTP was measured using the past-negative dimension of the Zimbardo Time Perspective Inventory (ZTPI).¹ The ZTPI has shown good cross-cultural reliability and validity.⁴¹ The past-negative dimension of the ZTPI comprises 10 items rated on a 5-point Likert scale. In the present study, the reliability coefficient of the PNTP scale was 0.83.

Statistical Analyses

All analyses in this study were made using the SPSS 23.0 and AMOS 23.0 software programs. First, we examined the descriptive statistics and correlations of the study variables using SPSS 23.0. Second, AMOS 23.0 was used to establish structural equation models and examine the mediating effects and differences in the totality of the meditator and non-meditator groups.

Results

Common Method Bias Test

After the data collection was completed, a Harman single factor test was used to test common method bias. The results showed that the first factor only accounted for 21.99% of variance, which was below the critical standard of 40%, indicating that common method bias was not significant.

Descriptive Statistics and Correlation Analysis of Each Variable

The results, as shown in Table 1, demonstrate that mindfulness is significantly positively correlated with resilience and inner peace. Conversely, PNTP is negatively correlated with mindfulness, resilience, and inner peace.

Table 1 Correlations Between Mindfulness, Resilience, Inner Peace, and PNTP

	Mean	SD	1	2	3	4
1. Mindfulness	3.82	0.75	–			
2. Resilience	2.45	0.51	0.37**	–		
3. Inner peace	3.33	0.69	0.38**	0.56**	–	
4. PNTP	2.84	0.70	–0.41**	–0.41**	–0.49**	–

Notes: n = 366, **p < 0.01.

Abbreviation: PNTP, past-negative time perspective.

t-Test for Differences Between Meditator and Non-Meditator Groups

After independent sample t-test and chi-square test, the results are shown in Table 2, no significant differences in gender, age, educational background or economic income between The two groups.

As shown in Table 3, results of the t-test indicated that meditators and non-meditators show significant differences in mindfulness, inner peace, and PNTP.

Testing the Multiple Mediation Model of Dispositional Mindfulness Influencing Past-Negative Time Perspective

Wu and Wen⁴² suggest that a single dimensional scale should be parceled. In the present study, these parcels

Table 2 t-Test and Chi-Square Test of Major Demographic Variables Between the Meditation Group and the Non-Meditation Group

	Meditator Group (n = 185)	Non-Meditator Group (n=181)	t/F-value	P
Age (years) (Mean±SD)	34.41±8.069	32.99±7.491	1.739	0.083
Gender			0.151	0.698
Male	110	104		
Female	75	77		
Educational situation			4.828	0.089
Junior college and below	38	31		
University	78	97		
Postgraduate	69	53		
Monthly income (RMB)			4.455	0.108
<3000	21	16		
3000~6000	106	123		
>6000	58	42		

Table 3 Group Differences Between Meditators and Non-Meditators in Mindfulness, Resilience, Inner Peace, and PNTP

	Mediator Group Mean±SD (n = 185)	Non-Mediator Group Mean±SD (n = 181)	t	P
Mindfulness	4.11±0.73	3.52±0.66	8.12***	0.000
Resilience	2.49±0.51	2.40±0.50	1.57	0.116
Inner peace	3.42±0.69	3.24±0.68	2.50*	0.013
PNTP	2.73±0.75	2.95±0.63	-2.99**	0.003

Notes: n = 366, *p < 0.05, **p < 0.01, ***p < 0.001.
Abbreviation: PNTP, past-negative time perspective.

were formed to control for inflated measurement errors caused by multiple items for the latent factor. Three item parcels each were created for mindfulness and PNTP and two item parcels were created for inner peace. A random algorithm was used to combine the items into parcels. In addition, the variables of gender and age were controlled in the subsequent structural equation model analysis. Next, we created a multiple mediation model to examine whether resilience and inner peace mediate the impact of dispositional mindfulness on PNTP, and, if so, how this is done. Finally, AMOS 23.0 was used to perform bootstrapping procedures to test the significance of the mediation effects of resilience and inner peace. We generated 2000 bootstrapping samples from the original dataset (N = 366) through random sampling. Empirical 95% confidence intervals did not contain zero, indicating that the indirect effect was statistically significant.

As shown in Figure 1 and Table 4, the bootstrap method revealed that both resilience and inner peace mediate the association between dispositional mindfulness and PNTP. The significant mediating roles were: (a) that of resilience for PNTP, accounting for 12.95% of the total effect (95% CI [-0.096, -0.001]); (b) that of inner peace for PNTP,

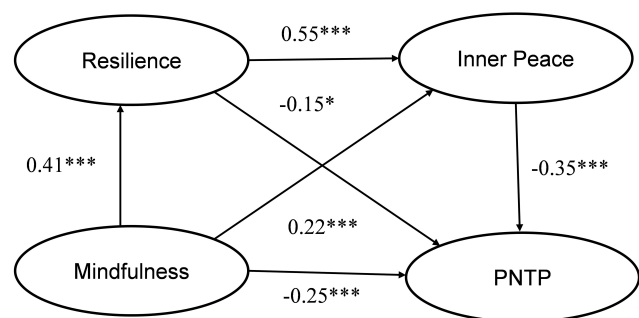


Figure 1 The multiple mediator model of mindfulness on PNTP.
Notes: *p < 0.05, ***p < 0.001.
Abbreviation: PNTP, past-negative time perspective.

Table 4 Bootstrapping Indirect Effects and 95% Confidence Intervals (CI) for the Mediation Model

Model Pathways	Effect Size	Bias-Corrected CI (95%)
	Standardized β	
Mindfulness→resilience→PNTP	-0.06*	[-0.096, -0.001]
Mindfulness→inner peace→PNTP	-0.08**	[-0.102, -0.023]
Mindfulness→resilience→inner peace→PNTP	-0.08***	[-0.102, -0.031]

Notes: n = 366, *p < 0.05, **p < 0.01, ***p < 0.001.
Abbreviation: PNTP, past-negative time perspective.

accounting for 16.35% of the total effect (95% CI [-0.102, -0.023]); and (c) the serial mediating role of resilience via inner peace for PNTP, which accounted for 16.99% of the total effect (95% CI [-0.102, -0.031]). Therefore, our findings also support hypotheses 1, 2, 3, and 4.

Testing Group Differences Between Meditators and Non-Meditators in the Multiple Mediation Model

First, the mediation effect model was tested on the mediator and non-mediator groups, respectively. The fit indices of the obtained models are shown in Table 5. Both the mediator model (M_m) and the non-mediator model (M_n) were acceptable and can be compared across groups.

Next, using the multi-group comparison method of structural equation modeling, the unconstrained model (M₁) and the structural covariances model (M₂) were set. The fitting results of the two models are shown in Table 5 wherein a significant difference between M₁ and M₂ (Δχ² = 52.18, Δdf = 19, p < 0.001) is indicated. These findings support hypothesis 5.

As shown in Figures 2 and 3 and Table 6, the bootstrap method was used to test the mediation effects of the mediator and non-mediator models. In the mediator group, the serial mediating role of resilience and inner peace between mindfulness and PNTP accounted for 23.44% of the total effect (95% CI [-0.188, -0.046]), and the serial mediating effects in the non-mediator group accounted for 10.98% of the total effect (95% CI [-0.109, -0.007]).

In the mediator group, resilience and inner peace had significant intermediation between mindfulness and PNTP, respectively. Resilience for PNTP accounted for 36.31% of the total effect (95% CI [-0.281, -0.065]), and inner

Table 5 Comparison of the Difference Between Meditator and Non-Meditator Groups in the Serial Mediation Models

Model	χ^2	df	RMSEA	GFI	NFI	TLI	CFI
M _m	98.936	58	0.062	0.927	0.927	0.957	0.968
M _n	111.915	58	0.072	0.918	0.884	0.918	0.939
M ₁	210.852	116	0.047	0.923	0.909	0.941	0.956
M ₂	263.033	135	0.051	0.905	0.886	0.931	0.941

Abbreviations: M_m, the meditator model; M_n, the non-meditator model; M₁, the unconstrained model; M₂, the structural covariances model.

peace for PNTP accounted for 40.25% of the total effect (95% CI [-0.322, -0.081]). The non-meditator group did not display these two effects.

Discussion

The Multiple Mediation Model of Dispositional Mindfulness Influencing Past-Negative Time Perspective in the Whole Group

Our findings show that dispositional mindfulness negatively affects PNTP. On the one hand, dispositional

mindfulness can negatively predict PNTP, and previous studies have found a negative correlation between dispositional mindfulness and PNTP.^{4,11} However, our research is a step forward from these studies as they have not further explored the relationship between dispositional mindfulness and PNTP. Mindfulness may be able to directly affect PNTP because mindfulness is a way of balancing awareness, encouraging one to observe thoughts and feelings without avoiding or attempting to change them or applying exaggeration or bias.³³ This style of awareness can help reduce self-criticism, avoid overthinking negative events, and protect individuals from the harmful effects of depression, anxiety, and other negative emotional states.^{13,14,39} Furthermore, as a result of the influences of culture, education, religion, social class, and family, humans can rely too much on a particular time perspective, and this behavior becomes automatic.¹ Mindfulness has a de-automating effect that can reduce tendencies towards cognitive behavioral habituation,⁴³ helping to reduce automatic or habitual overuse of a particular time perspective.

On the other hand, dispositional mindfulness can also indirectly affect PNTP through resilience or inner peace. This is consistent with the IAA model of mindfulness which indicates that mindfulness involves a nonjudgmental awareness and acceptance of the present experience.^{21,27} This enhances individuals' cognitive functioning and emotional regulation, thereby improving resilience and enhancing inner peace, and may, therefore provide a more balanced and flexible time perspective.

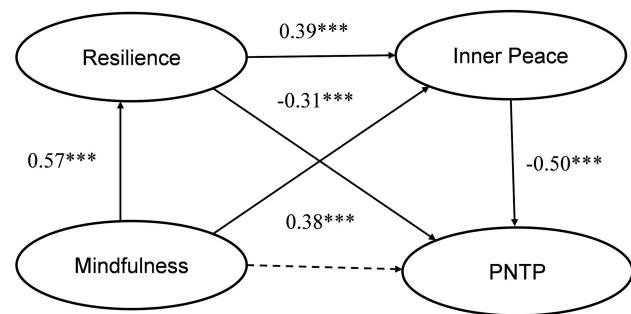


Figure 2 The multiple mediator model of mindfulness on PNTP (meditator group). **Notes:** The dashed lines in the figure indicate that the path coefficient was not significant; *** $p < 0.001$.

Abbreviation: PNTP, past-negative time perspective.

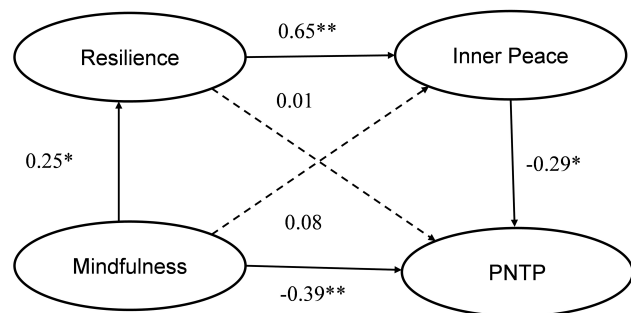


Figure 3 The multiple mediator model of mindfulness on PNTP (non-meditator group). **Notes:** The dashed lines in the figure indicate that the path coefficient was not significant; * $p < 0.05$, ** $p < 0.01$.

Abbreviation: PNTP, past-negative time perspective.

The Differences in Multiple Mediation Models of Dispositional Mindfulness Influencing PNTP in the Meditator and Non-Meditator Groups

The present study found that for the meditator group, the influence of dispositional mindfulness on PNTP was completely mediated by resilience and inner peace. For the non-meditator group, only a small part of the influence of dispositional mindfulness on PNTP was mediated by

Table 6 Bootstrapping Indirect Effects and 95% Confidence Intervals (CI) for the Mediation Model in Meditators and Non-Meditators

Model Pathways	Meditator Group (n = 185)		Non-Mediator Group (n = 181)	
	Effect Size (Standardized β)	Bias-Corrected CI (95%)	Effect Size (Standardized β)	Bias-Corrected CI (95%)
Mindfulness→resilience→PNTP	-0.175**	[-0.281,-0.065]	0.003	[-0.052, 0.054]
Mindfulness→inner peace→PNTP	-0.194***	[-0.322,-0.081]	-0.025	[-0.073, 0.008]
Mindfulness→resilience→inner peace→PNTP	-0.113***	[-0.188,-0.046]	-0.048*	[-0.109, -0.007]

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Abbreviation: PNTP, past-negative time perspective.

resilience and inner peace. This may be because in the meditator group, due to the regular and continuous practice of meditation, resilience and inner peace have gradually become internalized as relatively stable psychological qualities. This is consistent with previous studies showing that mindfulness meditation can cultivate qualities such as loving-kindness, compassion, inner peace, and resilience.^{20,33} Additionally, Buddhism has a system of meditative practices for cultivating similar qualities, further illustrating the importance of meditation practice. Mindfulness meditation has always emphasized that only by the consistent practicing of mindfulness skills can these qualities be cultivated, maintained, and improved.

Additionally, the present study found that for the meditator group, the effect of inner peace was greater than that of resilience, suggesting that inner peace may be an important predictor of and a good representation of Chinese emotional wellbeing. This finding is consistent with previous research.^{28,31} According to Lee et al,²⁹ traditional Chinese culture is greatly influenced by the three main religions or philosophies of Taoism, Confucianism, and Buddhism, which all value and emphasize inner peace. Additionally, mindfulness can promote inner peace, which is both consistent with previous research and with Buddhist thought.^{28,31} The ultimate goal of meditation is inner peace, and in Buddhism, inner peace is considered to be the most important thing in life.^{30,31}

Finally, the present study found that for non-meditators, the direct effect of mindfulness on PNTP accounted for 89.04% of the total effect. Arguably, the direct effect of mindfulness on PNTP is relatively large, while the indirect effect of resilience and inner peace only provide a relatively small part of the total effect. This shows that mindfulness can promote psychological functioning and mental health, allowing individuals to better understand, manage, and solve problems in daily life,

thereby reducing PNTP. However, the direct effect of mindfulness on PNTP also suggests that mindfulness may reduce PNTP in other ways as well. In addition to resilience and inner peace, there may be other mediating variables, which future research should work to identify.

Conclusion and Limitations

This study has a few limitations. Firstly, the results relied completely upon self-report data, which may have potential problems, such as recall bias or response bias. Also, mindfulness is a complex and abstract construct that involves an advanced level of meta-cognition,⁴⁴ so self-report methods may not be a reliable source of information.⁴⁵ Future research can add direct and objective assessment measures (e.g., the Triangle task) or qualitative analysis to supplement the assessment of mindfulness.⁴⁵ Secondly, since this study adopted a cross-sectional design, it was not appropriate to make causal inferences. In addition, we took mindfulness as the independent variable and PNTP as the mediating variable, and took inner peace or resilience as the dependent variables to make structural equation models. Although the models are weak, they remain significant, thus, the interpretation proposed here should be treated with proper caution. Future studies should design experiments or longitudinal studies that could complement and validate our findings.

Additionally, a multi-group analysis showed that, for meditators, the effect of dispositional mindfulness on PNTP was fully mediated by resilience and inner peace; however, for non-meditators, the effect of mindfulness on PNTP was partially mediated by resilience and inner peace. Thus, the mediational model was significantly different between meditators and non-meditators. On the basis of these findings, we conclude that dispositional mindfulness, resilience, and inner peace all negatively predict PNTP. Finally, some studies have found that the psychological

problems, such as emotional regulation, addiction, procrastination, anxiety, depression, can be relieved or reduced by regulating the individual's PNTF or by jointly regulating other dimensions of time perspectives.^{46,47} In the future, a combination of mindfulness and time perspective could be used to design new psychological interventions to regulate moods, manage addiction, reduce unhealthy behaviors, relieve stress and PTSD, and promote positive individual mental health outcomes.

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Author Contributions

All authors contributed to data analysis, drafting and revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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