# Resilience and Grit of College Students in China: Effects of Adverse Childhood Experiences and Mindfulness

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**Abstract**

Resilience and grit serve as crucial indicators of personal development. While existing research has established the detrimental consequences of adverse childhood experiences (ACEs) on individuals throughout their lives, limited knowledge exists regarding the impact of ACEs on resilience and grit, as well as the potential mediating role of mindfulness, and the moderating influence of gender, among Chinese college students. This cross-sectional online survey, encompassing 12 universities across China (n=1,871), revealed a negative association between ACEs and resilience and grit. The study identified mindfulness as a mediator in the relationship between ACEs and resilience and grit. Additionally, gender was found to moderate these relationships, with childhood abuse exhibiting a greater effect on male students, while childhood neglect displayed more pronounced effects on female students. The study's findings underscore the need for interventions and services aimed at enhancing mindfulness, resilience, and grit among at-risk populations.

Keywords: adverse childhood experience, college students, grit, mindfulness, resilience

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## Introduction

Both resilience and grit are crucial indicators of personal capacity and reliable predictors of future success and well-being (Duckworth et al., 2007; Rutter, 2006). Resilience refers to individuals' ability to positively adapt in the face of challenging events (Luthar et al., 2000; Rutter, 2006). Throughout their lives, individuals encounter various risks and challenges, and resilience plays a vital role in enabling them to effectively cope with associated stress and facilitate positive development (Prime et al., 2020; Bajaj & Pande, 2016). On the other hand, grit represents perseverance and a passionate commitment to achieving long-term goals (Duckworth et al., 2007). Grit serves as a reliable predictor of academic and professional success, as well as a significant indicator of health and well-being (Datu et al., 2018; Singh & Jha, 2008). Although resilience and grit are distinct concepts, they exhibit correlation with each other (Georgoulas-Sherry & Kelly, 2019; Meyer et al., 2020).

Adverse childhood experiences (ACEs) encompass negative events that occur during an individual's first 18 years of life, such as childhood abuse, neglect, and household challenges (CDC, n.d.). The prevalence of ACEs is high, with nearly two-thirds of youth globally reporting at least one ACE (Carlson et al., 2019). Moreover, in the United States, over 20% of participants in the original ACE study reported experiencing three or more ACEs (CDC, n.d.). ACEs have significant detrimental effects on child development and have predictive implications for social and health outcomes throughout the lifespan (Crandall et al., 2020; Elmore et al., 2020; Felitti et al., 1998). Additionally, ACEs have been found to influence mindfulness, resilience, and grit (Chen et al., 2023; Cheung et al., 2021; Hall et al., 2021).

Mindfulness is a cognitive state characterized by purposeful attention and non-judgmental reactions (Kabat-Zinn, 2003). It comprises two essential components: mindful attention and mindful metacognition. Mindful attention involves directing awareness to the present moment, while mindful metacognition entails intentionally disengaging from evaluative thoughts and emotions that may arise (Bishop et al., 2004; Reina & Kudesia, 2020). Research has demonstrated that mindfulness can enhance academic attainment, social skills, and emotional well-being (Caballero et al., 2019; Jiménez-Picón et al., 2021; Lu et al., 2017), as well as foster resilience and grit (Pérez-Aranda et al., 2021; Raphiphatthana & Jose, 2020; Yuan, 2021).

Given the predictive nature of resilience and grit for psychological and subjective well-being, particularly during challenging periods like the COVID-19 pandemic (Bono et al., 2020; Sulla et al., 2022; Yuan, 2021), it is imperative for the field to explore potential avenues of intervention to enhance resilience and grit among vulnerable populations, while also considering potential gender differences (Godbout et al., 2019). Therefore, the objective of this study is to investigate the effects of adverse childhood experiences (ACEs) on both resilience and grit, while also examining the potential mediating role of

mindfulness and the moderating influence of gender among Chinese college students.

This study is guided by the trauma theory proposed by Herman (1992). According to trauma theory, traumatic experiences can have adverse effects on well-being by giving rise to symptoms of hyperarousal, constriction, and intrusion (Herman, 1992). These trauma symptoms disrupt individuals' beliefs about safety and trust, challenging their sense of control, connection, and meaning in life (Briere, 2019; Modrowski et al., 2021). Within the framework of trauma theory (Herman, 1992), adverse childhood experiences (ACEs) can be understood as traumatic events that have long-lasting and significant consequences throughout an individual's life (Bryan, 2019; Herrenkohl et al., 2013; Mosley-Johnson et al., 2019). Individuals with ACEs may employ constriction as a coping mechanism, dissociating from triggering circumstances to manage overwhelming reactions rooted in a state of hyperarousal. Prolonged dissociation can impact mindfulness by limiting awareness and attention to the present moment (Bishop et al., 2004; Bolduc et al., 2018; Zerubavel & Messman-Moore, 2015). Decreased mindfulness, in turn, can hinder an individual's ability to cultivate resilience in the face of adversity and to foster perseverance and long-term goals, which are key aspects of grit (Dussault et al., 2022; Cheung et al., 2022). In summary, ACEs can diminish resilience and grit by reducing mindfulness. Figure 1 presents the conceptual framework of this study. Our hypotheses posit negative associations between ACEs and resilience and grit among Chinese college students, with mindfulness mediating these relationships. Furthermore, we anticipate that the effects of ACEs may vary by gender, as previous research suggests differential effects of ACEs on male and female populations (Chen et al., 2021; Godbout et al., 2019; Pierce & Jones, 2022). For instance, Chen et al. (2021) found that childhood abuse had a greater impact on resilience and well-being among female students, while household challenges exhibited a stronger effect on resilience and well-being among male students.

## Methods

The data for this study were collected through an anonymous online survey administered to junior and senior students in universities across China. The inclusion criteria were that participants had to be (a) social science students and (b) in their junior or senior year of college. The sampling procedure aimed to obtain a large and geographically diverse sample suitable for conducting multivariate analysis. A total of 12 prominent universities located in the northern, eastern, southern, western, and central regions of China were selected. The social science departments of these universities were contacted, resulting in a sampling frame of 2,229 students. In September 2020, all 2,229 students were invited to participate in the study, with reminders sent out 3 and 7 days after the initial invitation. Participants were informed about the voluntary nature of their participation and were free to withdraw at any time. The survey closed in early October 2020, yielding 1,881

responses. After excluding incomplete cases, the final analytic sample consisted of 1,871 students, resulting in a survey response rate of approximately 83.9%. The majority of the sample comprised female students, reflecting the gender distribution in the social science student population of Chinese academic institutions. The average age of the participants was 20.62 years. This study received approval from the research review committee at one of the co-authors' university and implemented an informed consent process.

Resilience was assessed using the Resilience Scale instrument (RS-14) developed by Wagnild (2016). The RS-14 consists of 14 items that evaluate five dimensions of individual resilience, including a meaningful and purposeful life, perseverance, equanimity, self-reliance, and existential aloneness. Previous studies have demonstrated the satisfactory validity and reliability of the RS-14 in diverse samples, including racially and ethnically diverse groups (Aiena et al., 2015; Pritzker & Minter, 2014), as well as Chinese populations (Shi et al., 2015; Tian & Hong, 2013). Participants were asked to indicate their level of agreement with each item over the past four weeks using a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A composite resilience score was calculated by summing the scores of all the items, with possible scores ranging from 14 to 98. Higher scores indicate greater perceived resilience. In this study, the Cronbach's alpha coefficient for these items was 0.92, indicating high internal consistency.

Grit was assessed using the 8-item Short Grit Scale (Grit-S) developed by Duckworth and Quinn (2009). The scale consists of two subscales: perseverance of effort and consistency of interests. Perseverance of effort measures an individual's ability to strive harder and maintain effort towards their goals, even in the face of challenges and hardships. Consistency of interests assesses an individual's ability to sustain long-term interest and engagement in a particular project or goal. The items in the Grit-S capture respondents' intrapersonal competencies and their capacity to maintain focus, interest, and perseverance over extended periods of time. To ensure consistent scoring, negatively worded items were recoded, with higher scores reflecting higher levels of grit. Average item scores, ranging from 1 to 5, were calculated to represent overall grit scores as well as scores for each subscale. In this study, the Cronbach's alpha coefficient for the Grit-S scale was .72, indicating satisfactory internal consistency.

Mindfulness was measured using the Mindful Attention Awareness Scale (MAAS) developed by Brown et al. (2011). The MAAS consists of 15 items that assess the frequency of various behaviors, thoughts, and experiences related to mindfulness over the past four weeks. Participants were asked to rate each item on a scale from 1 (almost never) to 6 (almost always). To ensure consistent scoring, item scores were reverse coded so that higher scores reflected higher levels of mindfulness. The responses were then summed to calculate a mindfulness score, which ranged from 14 to 90. The Chinese version of the MAAS has demonstrated validity and reliability for Chinese populations (Deng et al., 2011; Huang et al., 2019). In the present study, the Cronbach's alpha coefficient for the MAAS was .90, indicating high internal consistency.

Adverse Childhood Experiences (ACEs) were assessed using the ACE questionnaire developed by the CDC (n.d.). The questionnaire consists of 10 items that measure the occurrence of ACEs across three categories: abuse, neglect (including emotional and physical neglect), and household challenges. The abuse category includes items related to emotional, physical, and sexual abuse. The neglect category comprises items related to emotional and physical neglect. The household challenges category includes items related to parental separation or divorce, witnessing a battered mother, household substance abuse, mental illness in the household, and having an incarcerated household member. Participants were asked to indicate whether they experienced each ACE item prior to the age of 18. The sum of affirmative responses was used to calculate the ACE score, with higher scores indicating a greater number of ACEs. Scores were calculated separately for each ACE category, providing information about the specific types of ACEs experienced by participants.

The analysis commenced with descriptive analysis to examine the distribution and correlations of the key variables of interest. Following this, structural equation modeling (SEM) analysis was conducted to investigate the direct and indirect effects of ACEs on resilience and grit, as well as the potential mediating role of mindfulness. Maximum likelihood (ML) estimation was used, and model fit was assessed using various fit indices, including Chi-square statistics, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). A good model fit was indicated by Chi-square statistics values $>0.05$, CFI $>0.95$, RMSEA values $<0.08$, and SRMR $<0.08$. To explore potential moderation effects of gender on the relationships, separate SEM analyses were conducted by gender. Additionally, regression analyses were performed, incorporating a range of covariates such as personal characteristics. The results of the regression analyses align with the findings reported in this study. All analyses were carried out using STATA software version 16.0.

## Results

The descriptive statistics for the key variables are summarized in Table 1, and the correlation analysis results are presented in Table 2. The average resilience score for the sample was 13.42, while the average grit score was 3.07. The average mindfulness score reported by the students in our sample was 59.61. In terms of adverse childhood experiences (ACEs), the sample reported an average abuse score of 0.28, neglect score of 0.15, and household challenges score of 0.26. It is worth noting that female students had a significantly higher abuse score (0.30) compared to male students (0.24). The results of the correlation analysis supported our hypotheses. All three measures of ACEs showed significant negative correlations with mindfulness and resilience. ACE abuse and neglect were also found to have negative correlations with grit, while ACE household challenges did not show a significant correlation with grit.

Figure 2 presents the standardized estimates of the structural equation model (SEM). The model fit statistics indicate a good fit to the data: $\chi 2$ (6) = 12.1, $p > 0.05$, CFI = 0.99, RMSEA = 0.02, SRMR = 0.02, indicating mindfulness fully mediating the effects of ACEs on resilience and grit. The results show that child abuse and neglect directly reduced mindfulness (-0.14 and -0.11, respectively), while household challenges had a marginal effect on lowering mindfulness (-0.04) in Chinese college students. Mindfulness had a strong positive impact on resilience (0.51) and grit (0.42). The indirect effects of child abuse, neglect, and household challenges on resilience were -0.07 ($p < .001$), -0.05 ($p < .001$), and -0.02 ($p < .10$), respectively. Similarly, the indirect effects of abuse, neglect, and household challenges on grit were -0.06 ($p < .001$), -0.05 ($p < .001$), and -0.02 ($p < .10$), respectively.

Figure 3 presents the results of the moderation analysis. The likelihood-ratio tests indicated that the estimates of ACEs on mindfulness, resilience, and grit were significantly moderated by gender (LR chi2(12) = 141.5, $p < .001$). Specifically, child abuse and household challenges had a larger effect on mindfulness for male students (-0.17 and -0.08) compared to female students (-0.14 and -0.03). On the other hand, child neglect had a larger effect for female students compared to male students (-0.16 vs. 0.01). Mindfulness had larger effects on resilience for male students compared to female students (0.53 vs. 0.49), while it had larger effects on grit for female students compared to male students (0.48 vs. 0.33).

## Conclusion

Our study sheds light on the association between ACEs, resilience, and grit during emerging adulthood, highlighting a potential pathway through which these relationships operate. Our findings demonstrate that ACEs have detrimental effects on mindfulness, which in turn significantly impacts resilience and grit. Importantly, we observed gender differences in these relationships, emphasizing the need for gender-specific prevention and intervention strategies. Given the crucial role of resilience and grit in overall well-being and development, individuals who have experienced ACEs may encounter challenges across various domains of life, spanning from adolescence to adulthood. In light of these findings, it becomes imperative to implement mindfulness-based interventions as a means to mitigate the adverse effects of ACEs on resilience and grit, particularly for individuals who have experienced abuse and neglect. By targeting mindfulness, these interventions may serve as protective factors, fostering greater resilience and grit among those affected by ACEs.

Table 1. Descriptive Statistics of Main Variables

| Variables | ACE-Abuse | ACE Neglect | ACE Challenges | Mindfulness | Resilience | Grit |
|---|---|---|---|---|---|---|
| Sample | | | | | | |
| All (n=1,871) | 0.28 (0.63) | 0.15 (0.41) | 0.26 (0.61) | 59.61 (10.84) | 13.42 (3.07) | 3.07 (0.44) |
| Gender | | | | | | |
| Female (n=1,253) | 0.30 (0.63) | 0.15 (0.39) | 0.25 (0.55) | 59.35 (9.92) | 68.28 (12.41) | 3.07 (0.44) |
| Male (n=618) | 0.24 (0.62) | 0.16 (0.45) | 0.27 (0.72) | 60.13 (12.49) | 69.36 (15.25) | 3.07 (0.43) |
| F-Test | 4.5 * | 0.1 | 0.5 | 2.1 | 2.6 | 0.0 |

N=1,871. Standard deviation appears in parentheses. *p<.05

Table 2. Correlations of Main Variables

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. ACE abuse [0-3] | --- | | | | | |
| 2. ACE neglect [0-2] | 0.43*** | --- | | | | |
| 3. ACE household challenge [0-5] | 0.37*** | 0.38*** | --- | | | |
| 4. Mindfulness [15-90] | -0.20*** | -0.18*** | -0.13*** | --- | | |
| 5. Resilience [14-98] | -0.14*** | -0.14*** | -0.11*** | 0.51*** | --- | |
| 6. Grit [1.25-5] | -0.10*** | -0.07** | -0.04 | 0.42*** | 0.40*** | --- |

Figure 1. Hypothesized Model of ACEs, Mindfulness, Resilience and Grit

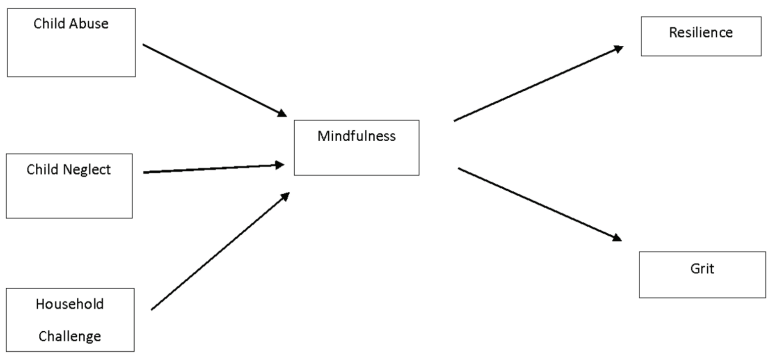
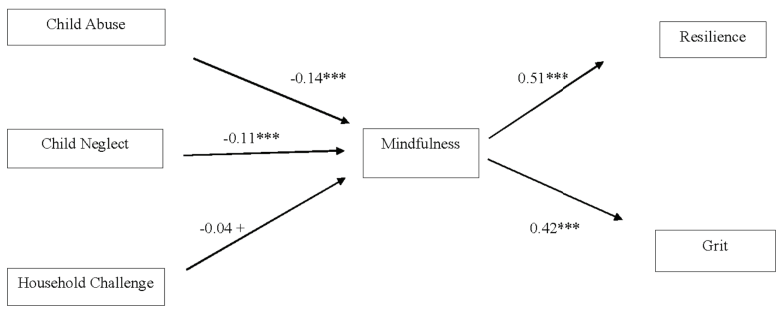



Figure 2. Estimates of Structural Equation Modeling



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