

Exploring the Mediating Role of Growth Mindset in the Relationship Between Attachment Styles and Mental Health Among College Freshmen

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Purpose: College freshmen face a heightened risk of mental health problems. Recent research has extensively explored attachment and growth mindset as key factors that influence mental health. However, the specific relationship between attachment and growth mindset remains unclear. This study aimed to investigate how attachment impacts the growth mindset of college students and explore the relationship between growth mindset, attachment, and mental health.

Methods: A survey of 684 college freshmen (80.1% female, average age 18.4) at a university in Huzhou was conducted using the Growth Mindset Scale, Adult Attachment Scale, and Symptom Checklist (SCL-90) and a demographic questionnaire to collect basic information about participants.

Results: The findings show that attachment security positively predicted growth mindset ($\beta=0.16$), whereas attachment insecurity negatively predicted growth mindset ($\beta=-0.22$). The research highlights that a growth mindset mediates the association between attachment security and mental health, and between attachment insecurity and mental health.

Conclusion: The results highlight the importance of fostering a secure attachment style and promoting a growth mindset as key factors for improving mental health. These findings suggest that incorporating growth mindset strategies into mental health education and interventions could help students with diverse attachment styles enhance resilience and better manage psychological challenges.

Keywords: mental health, SCL-90, attachment, growth mindset, college freshmen

Introduction

Mental health, as defined by the World Health Organization, encompasses emotional and psychological well-being, enabling individuals to navigate life's challenges, recognize their strengths, participate effectively in learning and work, and meaningfully contribute to their community. It holds both intrinsic and practical importance, and is vital for overall wellness.¹ In the evolving landscape of society, issues such as depression and anxiety have resurfaced. An individual's college years represent a pivotal phase in the transition to adulthood; it is a stage where individuals are particularly prone to mental health challenges. In the autumn of 2023, a health assessment conducted by the American College Health Association on 24,473 college students revealed that approximately 21.3% experienced severe psychological distress, 51.5% reported feelings of loneliness, and 26.3% displayed signs of suicidal behavior.² The Chinese National Mental Health Report 2022 from the Chinese Academy of Sciences examined the mental health status of nearly 80,000 college students and revealed detection rates of approximately 21.48% and 45.28% for risk depression and anxiety, respectively. The multitude of stressors during university years, including role transitions, interpersonal relationships, academic demands, and job searches, coupled with personal and family issues, have heightened the susceptibility of university students to mental health concerns.³ Freshman year marks the transition from high school to college, bringing about significant changes in students' academic tasks, interpersonal relationships, and overall life circumstances. This transition

can lead to increased stress on their mental health and coping abilities.⁴ Research indicates an increase in mental health issues among college freshmen, with studies showing that Chinese students, in particular, face psychological challenges during their freshman year.^{5,6} Therefore, it is crucial to identify the key factors influencing the mental health of college freshmen and delve into the underlying mechanisms at play.

Growth Mindset and Mental Health

Beliefs about the malleability of individual attributes have been shown to positively and significantly influence an individual's achievement, success, and mental well-being.⁷ A growth mindset rooted in Dweck's social cognitive theory, proposed that individuals' beliefs about their intelligence and abilities significantly influence their motivation, behavior, and emotional responses.⁸ Specifically, it entails the belief that intelligence and abilities are malleable and can be improved through effort, persistence, and adaptive coping with challenges. By contrast, a fixed mindset is characterized by the belief that intelligence and abilities are inherent and unchangeable.⁹

Growth mindsets are believed to have a positive impact on mitigating the adverse effects of negative life events, particularly when maladaptive cognitions, such as a belief in the fixed nature of a given condition, precede the onset of psychopathology.¹⁰ Individuals with a growth mindset tend to confront anxiety, frustration, and disappointment healthily and adaptively, thereby fostering resilience. Conversely, a fixed mindset often leads to avoidance of pain and frequently results in feelings of helplessness. Notably, individuals who maintain a growth mindset tend to exhibit higher levels of resilience.⁹ Currently, the growth mindset is recognized as a potential tool for addressing global mental health challenges and is gaining considerable attention from psychologists.¹¹ Recent meta-analyses on growth mindset interventions reveal robust associations with reduced psychological distress, improved well-being, and increased resilience, demonstrating growth mindsets' broad applicability in diverse contexts such as education, workplace, and clinical psychology.^{12,13} A growth mindset serves as a predictor of an individual's level of depression, anxiety, and repression,^{14,15} promoting mental health by enhancing life satisfaction and reducing emotional problems. Furthermore, it helps mitigate the negative impact of peer pressure on life satisfaction.¹⁶ Exposure of individuals to growth mindset interventions can improve mental health outcomes.¹⁷ A study involving 600 participants found that implementing a growth mindset intervention led to a reduction in clinically significant depressive symptoms compared to a control group.¹⁸ Emerging evidence suggests growth mindset's clinical utility may operate through reducing cognitive fusion - the entanglement with negative thoughts - as demonstrated by Zhao et al who identified attentional bias mediation in Chinese college populations.¹⁹ Adolescents embracing a growth mindset often exhibit an internal locus of control, believing in the malleability of their intelligence and personality; this enhances their ability to adapt to difficulties, akin to behavioral activation therapy.²⁰ Moreover, the application of a growth mindset in clinical psychology sheds light on how it affects mental health by promoting effortful attribution in the face of setbacks, persistence in coping with challenges, positive emotion regulation, and valuing therapy.²¹

College transition is often cited as a highly stressful period for many students.²² Freshmen commonly grapple with issues such as homesickness, shifts in social dynamics, and other psychological pressures stemming from family and societal expectations. Moreover, changes in academic performance play a significant role in the mental well-being of freshmen both internally and externally.⁵ Embracing a growth mindset can empower college students to adapt their responses to failure, recalibrate expectations of success, and modulate their levels of persistence and effort, ultimately affecting their academic performance and mental health outcomes.²³

Attachment, Growth Mindset, and Mental Health

Attachment, as defined by Bowlby, is a lasting emotional bond between individuals that can impact how intimate relationships are formed.²⁴ This theory suggests that attachment is not a fleeting occurrence but rather a continuous aspect of an individual's life, evolving from childhood to adulthood.²⁵ Numerous studies have indicated that adult attachment styles predict mental health outcomes, with secure attachment being linked to healthier emotion regulation and fewer psychological concerns, whereas attachment anxiety and avoidance are closely associated with maladaptive coping strategies depression, and heightened anxiety.^{26,27} Instead of simply categorizing individuals according to attachment types, researchers have emphasized the importance of examining attachment across various dimensions for a more comprehensive understanding.²⁴ These dimensions typically include attachment security and insecurity, with the latter being linked to stress, negative emotions, and health issues.²⁸

Studies often focus on attachment anxiety and avoidance as these dimensions are effective in predicting mental health outcomes. For college freshmen, attachment security is a valuable social asset positively correlated with academic and emotional adaptation.²⁹ It also plays a significant role in forming friendships, reducing loneliness, and enhancing adaptability among students.^{30,31} Therefore, first-year students need to recognize the impact of attachment security and insecurity on their mental health.

The relationship between attachment and a growth mindset has not yet been fully understood. Previous research has suggested that children who develop secure attachments tend to have a higher growth mindset than those who develop insecure attachments. This indicates that attachment plays a significant role in shaping children's mindset towards growth.³² Dweck points out that negative attachment experiences with parents could lead children to respond negatively to challenges and feel helpless, resembling those with a fixed mindset.⁸ Adult attachment patterns are often influenced by their early childhood experiences with primary caregivers. It is plausible to assume that adults with secure attachment relationships may also exhibit higher levels of a growth mindset.

Attachment theory, originated by Bowlby (1982), proposes that early caregiving experiences shape internal working models that affect cognition, emotions, and behavior.³³ Cognitive behavioral therapy asserts that cognition plays a crucial role in emotions, behavior, and reactions, influencing psychological behavior. Psychological disorders are thought to stem from a combination of internal and external factors. The therapeutic aim of cognitive behavioral therapy is to help patients identify their mental symptoms and gradually modify irrational thoughts, thinking patterns, and beliefs, while incorporating structured behavioral training to change emotional and behavioral responses to events, thus improving their condition.³⁴ Building on attachment and developmental research, an individual's attachment style may impact belief formation, emotional expression, coping with setbacks, and, ultimately, mental health.

Previous research has primarily focused on the relationships between attachment, growth mindset, and mental health. There is little exploration of how attachment influences growth mindset and the potential mediating role of growth mindset in the relationship between attachment and mental health outcomes. Studies on the mental health of Chinese college students typically examine aspects such as mental health status, knowledge, and literacy, and conduct longitudinal research on psychological disorders. However, there is a lack of analysis of the overall mental health of freshmen, specifically in the Chinese context. College students' mental health is often complex, with various psychological problems, such as anxiety and maladjustment. Attachment and growth mindsets have been shown to significantly affect mental health. Understanding how attachment and growth mindsets influence freshmen's mental health is crucial for developing effective prevention and intervention strategies in schools.

This study investigated the impact of growth mindsets on the relationship between attachment styles and mental health, see [Figure 1](#). Thus, Six hypotheses are proposed:

H1: Attachment security has a significant effect on mental health.

H2: Attachment security has a significant effect on growth mindset.

H3: Attachment insecurity has a significant effect on mental health.

H4: Attachment insecurity has a significant effect on growth mindset.

H5: Growth mindset plays a mediating role in the effect of attachment security on mental health.

H6: Growth mindset plays a mediating role in the effect of attachment insecurity on mental health.

Methods

Participants

The study included 700 first-year students from Huzhou University who participated voluntarily. A total of 684 students completed the survey, with a participation rate of 97.71%. Sixteen students were excluded from the analysis because their academic schedules conflicted with the timing of the survey. [Table 1](#) presents the participants' socio-demographic details.

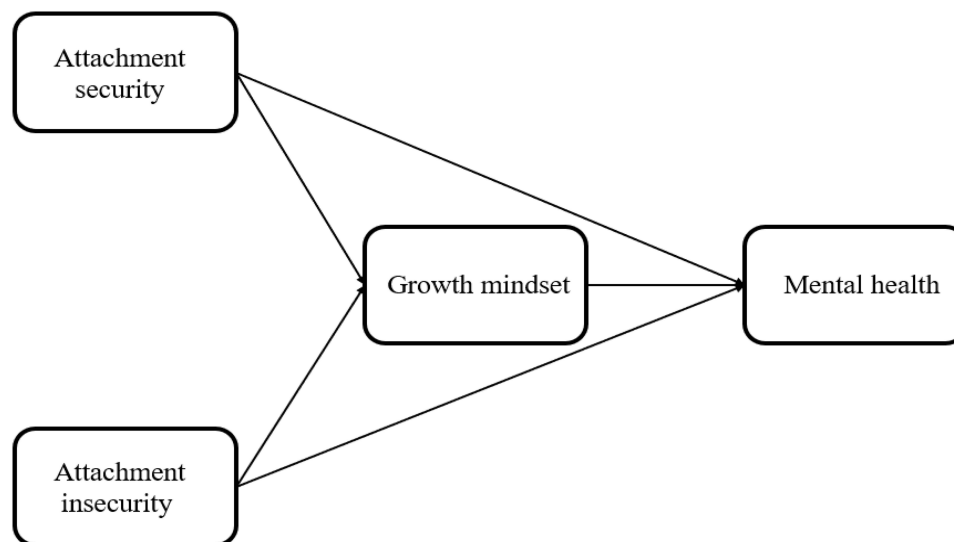


Figure 1 Research theoretical hypothesis model diagram.

Measurements

The questionnaire consisted of four sections, personal information, and three scales. Personal information was prepared by the researcher and consisted of five questions regarding gender, age, profession, socio-economic status, and birthplace.

Adult Attachment

The Adult Attachment Scale (AAS), originally developed by Collins and Read and later adapted to Chinese by Wu et al,³⁵ is a questionnaire consisting of 18 items designed to assess the levels of attachment security and insecurity in adults. Attachment security was assessed using average scores from the intimacy and dependence subscales, while attachment insecurity was determined using the anxiety subscale. A 5-point Likert scale ranged from 1 (completely consistent) to 5 (completely inconsistent) was used. Internal consistency, assessed through Cronbach's α coefficient, yielded a value of 0.69 for the attachment security and 0.81 for the attachment insecurity dimensions.

Mental Health

The Self-Reporting Inventory (SCL-90) is a widely used mental illness test composed of 90 items that measure 10 factors, including somatization, obsessive symptoms, interpersonal sensitivity, depression, anxiety, hostility, fear,

Table 1 Sociodemographic Information of Participants (n=684)

	n	%
Gender		
Male	136	19.9
Female	548	80.1
Family economic status		
Affluent and relatively affluent	128	18.7
Average	496	72.5
Low-income	60	8.8
Students origin		
Provincial capital cities	112	16.3
Non-provincial capital cities	229	33.5
Township	124	18.2
Rural areas	219	32.0

paranoia, and others.³⁶ Each item is rated on a scale of 0–4, with lower scores indicating better psychological status. The total score of the SCL-90 was calculated as the sum of the scores of all 90 items; the factor score was the total score of the items that comprised a specific factor divided by the number of items within that factor. Higher SCL-90 scores indicate deteriorating mental health. Cronbach's α coefficient for the SCL-90 was 0.96.

Growth Mindset

The study utilized the Chinese version of the Growth Mindset Inventory adapted by Zhao et al,³⁷ to measure growth mindset. The inventory consists of six items, three representing fixed mindset and three reflecting growth mindsets. Scores for fixed mindset items were reversed, while scores for growth mindset items were kept unchanged. A higher total score indicates a stronger growth mindset, whereas a lower score indicates a fixed mindset. The scale showed good reliability with a Cronbach's α coefficient of 0.84.

Procedures

This cross-sectional study was conducted at Huzhou University in Zhejiang Province, China and was approved by the Research Ethics Committee of the College of Teacher Education at Huzhou University. In the autumn of 2023, convenience sampling was used to recruit 700 first-year students at Huzhou University who voluntarily participated in the study. Approximately 50 participants were gathered in a specific classroom and the questionnaires were distributed by hand or by scanning a QR code. Verbal informed consent was obtained from all participants before the survey commenced. The classroom in which the survey was conducted contained a master's test; all participants were asked to provide truthful, independent responses and complete the questionnaire according to uniform instructions. For the master's test, a well-trained graduate student in psychology is responsible for overseeing the completion of the questionnaire survey and addressing any potential issues that may arise during the process. The average time taken to complete a single questionnaire was approximately ten minutes.

Data Analysis

Data analyses were conducted using SPSS 26.0 and PROCESS 3.3 software in SPSS. The preliminary analysis involved examining the correlations between variables (see Table 2). Kurtosis and skewness were used to assess whether the variables were normally distributed. Mediation analysis was performed using Model 4 in the PROCESS software. Since the participants were all from the same grade and predominantly female, age (with a standard deviation of 0.92) and gender (less than 20% of the participants were male) were not considered control variables. The questionnaire included socioeconomic status as a control variable because of its potential impact on mental health. Direct and indirect effects were estimated using the bootstrap method and their significance was determined using a 95% confidence interval (CI). An effect was considered significant if the 95% CI did not include zero. To balance the power and Type I error rates, Monte Carlo confidence intervals were used to evaluate the significance of the indirect effect, a method comparable to the bootstrap method in certain studies.^{38,39}

Table 2 Descriptive Statistics and Correlational Analysis of Attachment, Growth Mindset, Mental Health, and Control Variables

	1	2	3	4	5	M	SD	Skewness	Kurtosis
1 Socioeconomic status	—					1.90	0.52	−0.14	0.59
2 Attachment security	0.15**	—				3.43	0.51	−0.18	0.55
3 Attachment insecurity	0.07	−0.47**	—			2.71	0.81	−0.02	−0.55
4 Growth mindset	0.04	0.15**	−0.22**	—		3.60	0.98	0.01	−0.02
5 Mental health	0.03	−0.35**	0.49**	−0.22**	—	1.47	0.43	1.44	2.26

Note: ** $p < 0.01$.

Abbreviations: M, Mean; SD, Standard Deviation.

Results

Demographic Analysis

Significant differences were found between male and female university students in attachment anxiety ($t=-2.53, p < 0.05$) and fixed mindset ($t=-3.19, p=0.01$); other variables did not show significant differences. Female students exhibited higher levels of attachment anxiety (2.75 ± 0.79) compared to male students (2.55 ± 0.85), whereas male students had lower levels of fixed mindset (2.85 ± 1.30) than female students (3.20 ± 1.11).

Socioeconomic status was classified into four levels: affluent ($n=5$), relatively affluent ($n=123$), average ($n=496$), and low-income ($n=60$). Due to the limited sample size in the “affluent” category, subsequent analyses merged it with the “affluent and relatively affluent” category, resulting in three levels: Affluent and relatively affluent ($n=128$), average ($n=496$), and low-income ($n=60$). The findings indicated a significant impact of socioeconomic status on attachment security, $F(2681) = 7.74, p < 0.001$, with no significant differences in other variables. Further post hoc tests revealed that individuals with affluent and relatively affluent socioeconomic status exhibited significant higher attachment security (3.56 ± 0.49) compared to those with average socioeconomic status (3.42 ± 0.49). Individuals with average socioeconomic status displayed significantly higher attachment security (3.26 ± 0.58) than those with low-income socioeconomic status.

Birthplace was categorized into four groups: provincial capital cities, non-provincial capital cities, townships, and rural areas. The results showed that birthplace did not have a significant effect on attachment, growth mindset, and mental health status (all $p > 0.05$).

Correlation Analysis

he correlation analysis results presented in Table 2 show that attachment security was significantly positively correlated with a growth mindset ($r = 0.15, p < 0.01$) and negatively correlated with mental health ($r = -0.35, p < 0.01$); Conversely, attachment insecurity was negatively correlated with growth mindset ($r = -0.22, p < 0.01$) and positively correlated with mental health ($r = 0.49, p < 0.01$), while growth mindset was negatively correlated with mental health ($r = -0.22, p < 0.01$). Socioeconomic status was significantly and positively associated with attachment security ($r = 0.15, p < 0.01$).

Mediation Analysis

Attachment Security, Mental Health, and Growth Mindset

Incorporating socio-economic status into the path analysis reveals that attachment security has a significant negative predictive effect on mental health (H1), as indicated in Table 3. Although growth mindset is included in the regression equation, attachment security maintains its significant predictive power for mental health ($\beta = -0.33, F(3680) = 47.96, p < 0.001$). Additionally, attachment security shows a significant positive predictive effect on growth mindset (H2) ($\beta = 0.16, F(2681) = 9.13, p < 0.001$), while growth mindset negatively predicts mental health ($\beta = -0.17, F(3680)$

Table 3 Regression Analysis of the Mediation Model of Growth Mindset Between Attachment Security and Mental Health

	Growth Mindset	Mental Health
	$\beta(SE)$	$\beta(SE)$
Control Variable:		
Socioeconomic status	0.06 (0.07)	-0.01 (0.069)
Independent Variable:		
Attachment security	0.16 (0.038) ***	-0.33 (0.036) ***
Mediator Variable:		
Growth mindset		-0.17 (0.036) ***
R^2	0.026	0.151
F	9.13	40.43

Note: *** $p < 0.001$.

Abbreviation: SE, Standard Error.

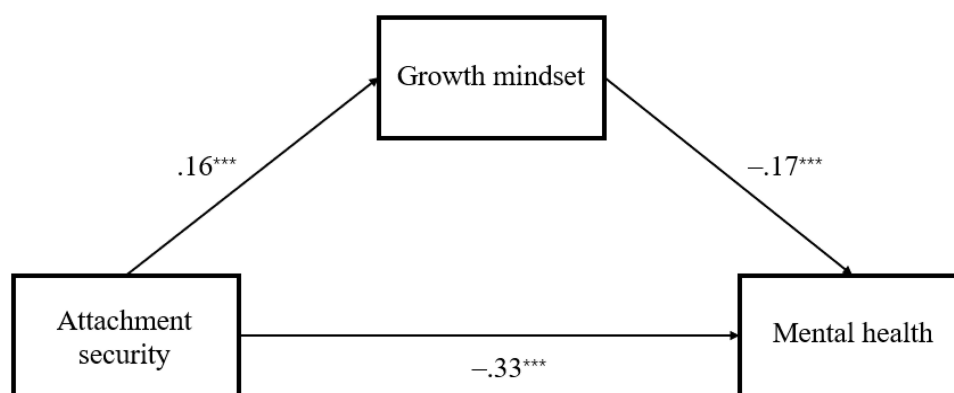


Figure 2 Standardized coefficients of attachment security, growth mindset, and mental health.

Note: *** $p < 0.001$.

=40.427, $p < 0.001$), see [Figure 2](#). These findings suggest that a growth mindset mediates the relationship between attachment security and mental health (H5).

[Table 4](#) illustrates that attachment security significantly impacts mental health, explaining 93.33% (SE=0.03, 95% CI= -0.34 – -0.22) of the variance, while only 6.67% of the effects are mediated by a growth mindset (SE=0.01, 95% CI= -0.048 – -0.01). These findings suggest a mediation effect, albeit of a relatively small magnitude.

Attachment Insecurity, Mental Health, and Growth Mindset

As shown in [Table 5](#), attachment insecurity has significant positive predictive effects on mental health after incorporating socio-economic status into the path analysis (H3). Even when the growth mindset is included in the regression equation,

Table 4 Analysis of the Mediation Effect of Growth Mindset between attachment security and mental health

	Estimated	SE	Boot LLCI	Boot ULCI	Relative Effect
Total effect	-0.30	0.03	-0.36	-0.25	
Direct effect	-0.28	0.03	-0.34	-0.22	93.33%
			MC LLCI	MC ULCI	
Indirect effect	-0.02	0.01	-0.04	-0.01	6.67%

Abbreviation: SE, Standard Error.

Table 5 Regression Analysis of the Mediation Model of Growth Mindset Between Attachment Insecurity and Mental Health

	Growth Mindset	Mental Health
	β (SE)	β (SE)
Control Variable:		
Socioeconomic status	0.06 (0.07)	0.004 (0.065)
Independent Variable:		
Attachment insecurity	-0.22 (0.037)***	0.46 (0.034)***
Mediator Variable:		
Growth mindset		-0.12 (0.034)***
R^2	0.05	0.25
F	17.66	75.63

Note: *** $p < 0.001$.

Abbreviation: SE, Standard Error.

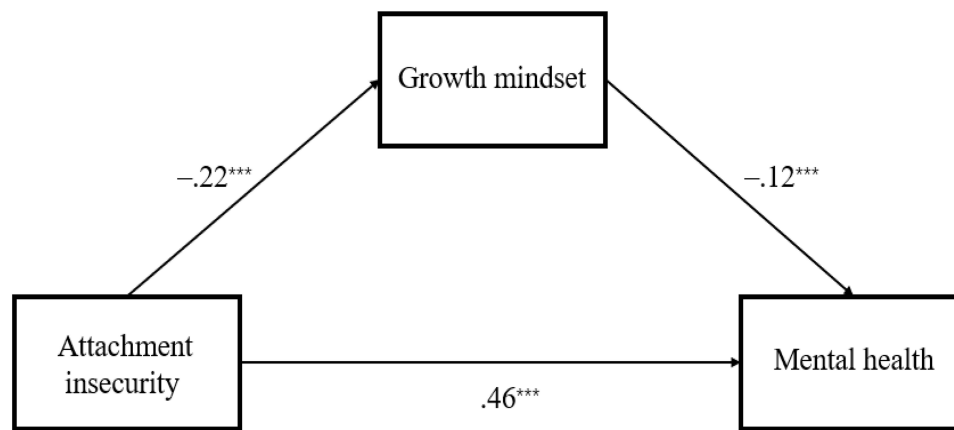


Figure 3 Standardized coefficients of attachment insecurity, growth mindset, and mental health.

Note: *** $p < 0.001$.

attachment insecurity still significantly predicts mental health ($\beta=0.46$, $F(3680)=105.53$, $p < 0.001$). Simultaneously, attachment insecurity has a significant negative predictive effect on growth mindset (H4) ($\beta=-0.22$, $F(2681)=17.66$, $p < 0.001$), while growth mindset negative predicts mental health ($\beta=-0.12$, $F(3680)=75.63$, $p < 0.001$). These results show that a growth mindset plays a mediating role between attachment insecurity and mental health (H6), see Figure 3.

Table 6 shows that attachment insecurity has a direct effect on mental health amounting to 96.15% (SE=0.02, 95% CI=0.21–0.28), compared with 3.85% of the indirect effects of growth mindset intermediation (SE=0.01, 95% CI=0.01–0.03). This outcome affirms the existence of a mediation effect, albeit a relatively small one.

Discussion

The primary aim of this study was to explore the relationships between growth mindset, attachment, and mental health. This study reveals two key findings. First, attachment security can promote the growth mindset of college freshmen but can be hindered by attachment insecurity. Second, the growth mindset acted as a mediator between attachment security and mental health, and between attachment insecurity and mental health. These results emphasize the significant predictive impact of attachment style on individual mental health, while the growth mindset can partially attenuate the effects of mental health to a certain extent.

Our study revealed a significant correlation between attachment and growth mindset among college freshmen, highlighting the predictive role of various attachment dimensions. Specifically, attachment security was found to have a positive impact on growth mindset, whereas attachment insecurity had a negative effect. These results align with those of Cho, who found that children with secure attachment are more likely to believe in their ability to grow and change through personal effort, thus enhancing their motivation to achieve their goals.³² Furthermore, individuals with secure attachments tend to hold positive attitudes towards their abilities and values, leading to perseverance in the face of challenges. This resilience is indicative of a higher growth mindset.⁸ One possible explanation for these findings is that early childhood interactions play a crucial role in shaping one's self-concept.⁴⁰ Attachment styles, which are patterns of

Table 6 Analysis of the Mediation Effect of Growth Mindset between attachment insecurity and mental health

	Estimated	SE	Boot LLCI	Boot ULCI	Relative Effect
Total effect	0.26	0.02	0.23	0.30	
Direct effect	0.25	0.02	0.21	0.28	96.15%
			MC LLCI	MC ULCI	
Indirect effect	0.01	0.01	0.01	0.03	3.85%

Abbreviation: SE, Standard Error.

emotional and behavioral responses in relationships, have been linked to overall self-perception. Individuals with secure attachment are more likely to develop a positive self-concept,⁴¹ viewing themselves as valuable and capable of coping with stress, and fostering the desire to learn, adapt, and improve various aspects of their lives. Moreover, individuals with high levels of attachment security tend to have stronger social relationships than those with attachment insecurity, and supportive relationships promote a growth mindset.⁴² Conversely, individuals coping with insecure attachment run the risk of developing negative self-perceptions and diminished self-esteem and are often inclined to perceive personal shortcomings and disillusionments as individual failures.⁴³ This is not conducive to the formation and development of a growth mindset.

These results suggest that attachment security could significantly impact the development of a growth mindset, helping individuals overcome a fixed mindset. Schools are advised to consider students' attachment styles when gathering basic enrolment information. These data can assist school counselors in offering timely support to incoming college students who may feel anxious or lost during the enrolment process, based on their attachment styles. Furthermore, schools should focus on creating a campus environment that foster learning and personal development. This approach not only provides valuable social support for students with varying attachment styles but also helps cultivate a growth mindset among college students.

The study found that a growth mindset acts as a mediator between attachment security and mental health as well as between attachment insecurity and mental health. While there is limited empirical research on the mediating role of a growth mindset in the connection between attachment and mental health, insights from attachment theory and cognitive behavioral therapy support the hypotheses. Attachment theory views adult attachment as the beliefs, expectations, and feelings learned from interactions with caregivers during infancy.⁴⁴ Securely attached adults tend to have positive beliefs about themselves and others, demonstrating independence and trustworthiness. Insecure attachment often leads to helplessness, withdrawal in the face of setbacks, and negative self-evaluation. Cognitive therapy suggests that human behavior is influenced by cognitive beliefs, whereas behavioral therapy focuses on modifying problematic behavior.¹⁰ Cognitive behavioral therapy combines these approaches to use individual thought patterns to improve emotional and behavioral responses, thereby enhancing mental health.³⁴ Beliefs formed during childhood-nurturing experiences may affect mental health responses to life situations. By considering the influence of attachment on growth mindset, this study provides empirical support for the mediating role of growth mindset in the relationship between attachment and mental health.

In addition to the two key findings, this study found that attachment security and insecurity significantly predict mental health outcomes. These results are consistent with previous studies on attachment and mental health, indicating that attachment insecurity is linked to poorer mental health, whereas attachment security is associated with positive psychological development.^{24,45,46} For freshmen, the transition from high school to college involves significant changes, with university life emphasizing individual autonomy and peer relationships, leading to distance from family members and shifts in academic expectations.⁴⁷ College students with high levels of attachment security tend to have stable relationships built on trust in family and friends and positive self-awareness, and are better equipped to navigate challenges during academic and environmental transitions in a proactive and resilient manner. However, those with higher levels of attachment insecurity may struggle with emotional and social self-efficacy when their basic needs are not met, increasing their vulnerability to maladaptation and affecting their psychological well-being. Therefore, psychological health-related organizations within educational institutions must focus on the levels of attachment security and insecurity among college freshmen.

To promote a growth mindset among college freshmen and to support their mental health, educational institutions should integrate growth mindset training and interventions into teacher education programs. This approach equips educators with the knowledge and skills required to comprehend the essence, attributes, and strategies associated with fostering a growth mindset. Training should emphasize the identification of relational elements that contribute to the cultivation of a growth mindset, such as employing appropriate forms of praise and interpreting failure and setbacks, while taking into account the diverse attachment styles of students. Burnette et al contrasted and summarized various growth mindset intervention studies focusing on academic achievement, mental health, and social functioning, revealing significant heterogeneity in growth mindset interventions related to psychological health.¹⁷ Schools should consider

overall resource allocation and individual student circumstances when selecting interventions that are appropriate for students and feasible for implementation.

Gender differences in attachment anxiety and fixed mindset may arise from a blend of sociocultural and psychological influences. Female college students showed higher attachment anxiety, consistent with prior research indicating that women are often socialized to prioritize interpersonal relationships and emotional bonds.⁴⁸ This focus on relational dynamics may heighten their sensitivity to social stressors, resulting in greater attachment anxiety. In contrast, male students displayed a lower tendency toward a fixed mindset than their female peers. This could reflect societal norms that promote independence and adaptability in males—qualities linked to a growth mindset. Meanwhile, females may face stronger pressures to achieve perfection in academic and personal spheres, fostering a more fixed mindset.

Limitations and Future Directions

This study focused on college freshmen in a university and utilized a convenience sampling method, which may have led to selection bias. The findings should be interpreted with caution, as regional, cultural, and educational differences within the sample, along with the non-random sampling approach, may limit their broader applicability. Meanwhile, the notable gender imbalance in the sample—where female participants significantly outnumbered male participants—may limit the generalizability of the findings. Future research should aim to replicate these findings with a more balanced gender ratio to ensure broader applicability. Furthermore, the research data relied on questionnaires completed by the participants simultaneously, potentially introducing biases stemming from variations in subjective perceptions among the respondents. Using data collected concurrently may not be optimal for studying the long-term effects of attachment and growth mindset on mental health; future research could mitigate this limitation by gathering data from participants across different periods and regions with diverse cultural and economic backgrounds. This approach would enable the observation, detection, and comparison of dynamic changes and causal relationships among research variables. Moreover, given the relatively nascent nature of this area of study, further investigation is necessary to explore the influence of a growth mindset on attachment and mental health. Collaboration among experts in psychology, education, and medicine could yield more neuroscientific evidence regarding the relationship between attachment and growth mindset, as well as the impact of growth mindset attachment on mental health. This interdisciplinary approach may foster additional empirical research on mental-health interventions for college students.

Conclusion

The findings suggest that college freshmen with secure attachment styles are more likely to have growth mindsets, whereas those with insecure attachment styles are less likely to possess growth mindsets. Moreover, the study revealed that a growth mindset plays a crucial role as a mediator between attachment security and mental health, as well as between attachment insecurity and mental health. Interventions on growth mindset are very popular in the field of education, and their intervention processes and materials are relatively easy to understand and obtain. Through a combination of online and offline learning, educational institutions can provide students with learning platforms and resources for growth thinking. This would help students with different attachment styles understand the plasticity of their own abilities, and improve students' ability to actively deal with negative emotions or challenging events.

Data Sharing Statement

The data supporting the findings of this study are available from the corresponding author. Requests for access to the data should be directed to neweidongtao@gmail.com.

Ethics Statement

This study was performed in line with the principles of the Declaration of Helsinki. Ethical approval was obtained from Research Ethics Committee of the School of Teacher Education of Huzhou University (Approval No. [20220812]).

Participants provided written informed consent to participate in this study, personally identifiable information has been anonymized.

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Disclosure

The authors declare no competing interests in this work.

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