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Factors Affecting on Growth Mindset of university students in China

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Abstract

Background and Aims: In China, traditional education models often emphasize grades and rankings, which can easily lead students to develop a fixed mindset, limiting their potential and leading to negative emotions or giving up when facing setbacks. This study aims to investigate the influence of grit, optimism, school climate, peer influence, teacher mindset beliefs on the growth mindset of university students in China.

Methodology: This study employed a questionnaire survey, with a total of 350 students invited to complete the questionnaire. Conclusions were drawn through correlation analysis and stepwise multiple regression analysis

Results: (1) All Independent variables showed significant positive correlations with growth mindset: grit (r=.661, p<.01), optimism (r=.604, p<.01), school climate (r=.639, p<.01), peer influence (r=.619, p<.01), and teachers' mindset belief (r=.705, p<.01); (2) Three significant predictors of students' growth mindset were identified: teacher mindset beliefs ($p < 0.001$), optimism ($p < 0.001$), and grit ($p < 0.001$).

Conclusion: Based on these findings, it is recommended to implement strategies that foster the development of students' growth mindset by enhancing grit and optimism, and by strengthening teachers' own mindset beliefs to positively influence students.
Keyword: Growth Mindset; Grit; Optimism; School Climate; Peer Influence; Teacher's Mindset Belief; University Students

Introduction

The concept of a growth mindset was proposed by psychologist Carol Dweck. According to Dweck, a growth mindset refers to the belief that one's abilities and intelligence can be continuously improved through effort, learning, and perseverance (Dweck, 2006). A growth mindset fosters resilience by encouraging individuals to view failures as learning opportunities rather than as reflections of their abilities. This perspective helps people to cope better with stress and adversity. They are more likely to bounce back from setbacks and remain motivated to achieve their goals (Yeager & Dweck, 2012). However, fostering this beneficial growth mindset faces significant challenges within China's demanding, exam-oriented education system. Traditional models emphasizing grades and rankings readily promote a fixed mindset—the belief that intelligence is static—among students (Yang, 2020). This fixed mindset limits potential and can lead to negative emotions and a tendency to give up when facing setbacks.

In 2021, the OECD published a report on growth mindset as part of the PISA assessment, which surveyed 600,000 students from 78 countries and economies. The results showed that in many countries, the belief in a growth mindset has become widely internalized and relatively stable among students. Although Chinese students generally devote more time to studying than Western students, they are more inclined to endorse a fixed mindset. This tendency may be attributed to the exam-oriented nature of China's education system and its broader cultural context. Kim (2017) further found that Chinese students who grew up in the United States were more likely to adopt a growth mindset than those who grew up in China, indicating that educational environments and related

factors have a profound impact on the formation of students' thinking patterns (Kim et al., 2017). For a long time, China's basic education system has used academic scores as the sole indicator of student development, which has led to increasingly prominent psychological and behavioral problems among students (Huang & Zeng, 2023). Although China has been promoting education reforms guided by the concept of "core competencies," which emphasize the development of soft skills such as critical thinking, problem-solving, and mental well-being, the prevalence of growth mindset among students still remains limited (Xia, 2025).

This persistent challenge within the unique Chinese context points to a critical research gap. While existing studies on growth mindset are predominantly situated in Western settings, localized research focusing specifically on Chinese university students and the complex interplay of influencing factors is scarce. Crucially, there is a lack of integrated models that simultaneously consider both individual psychological traits and key social-environmental factors relevant to the Chinese educational landscape. To address this gap, the present study focuses on the development of growth mindset among Chinese university students and examines its key influencing factors. This research seeks to contribute to theoretical advancement in understanding mindset development within exam-centric systems and offer practical implications for psychological education in Chinese higher education.

Objectives

1)To investigate the relationship between grit, optimism, school climate, peer influence, teacher mindset belief and the growth mindset.

2)To investigate the influence of grit, optimism, school climate, peer influence, teacher mindset belief on the growth mindset of university students in China.

Research Hypothesis

1)The grit, optimism, school climate, peer influence and teacher mindset belief, will correlate the growth mindset of university students in China.

2)The grit, optimism, school climate, peer influence and teacher mindset belief will influence the growth mindset of university students in China.

Literature Review

1)Grit can enhance a growth mindset. Individuals with grit are more likely to engage in deliberate practice, which helps them improve their skills (Duckworth et al., 2007). Kannangara's research found a positive correlation between grit and mindset. Students who scored high on the grit scale also scored high on the mindset scale, indicating that those with higher levels of grit are more likely to possess a growth mindset.

2)Dardick (2019) investigated the potential relationship between optimism/pessimism and implicit theories of intelligence. The study found that the direct path from optimism to a growth mindset was significant, as was the path from pessimism to a fixed mindset. Paunesku (2015) also confirmed that optimistic and pessimistic emotions influence the development of growth and fixed mindsets (Paunesku et al., 2015).

3) School climate can shape students' mindsets and continue to develop as students advance to higher grade levels, with particular emphasis on ability and performance (Tang et al., 2019). During adolescence, beliefs about growth and fixed mindsets become more nuanced and specific. Adolescents' attributions about the mindset of their school are influenced by their belief in a just world and their perception of the school climate (Thomas et al., 2019). School climate can also influence students' growth mindset by providing an environment that supports autonomous development (Chen et al., 2024).

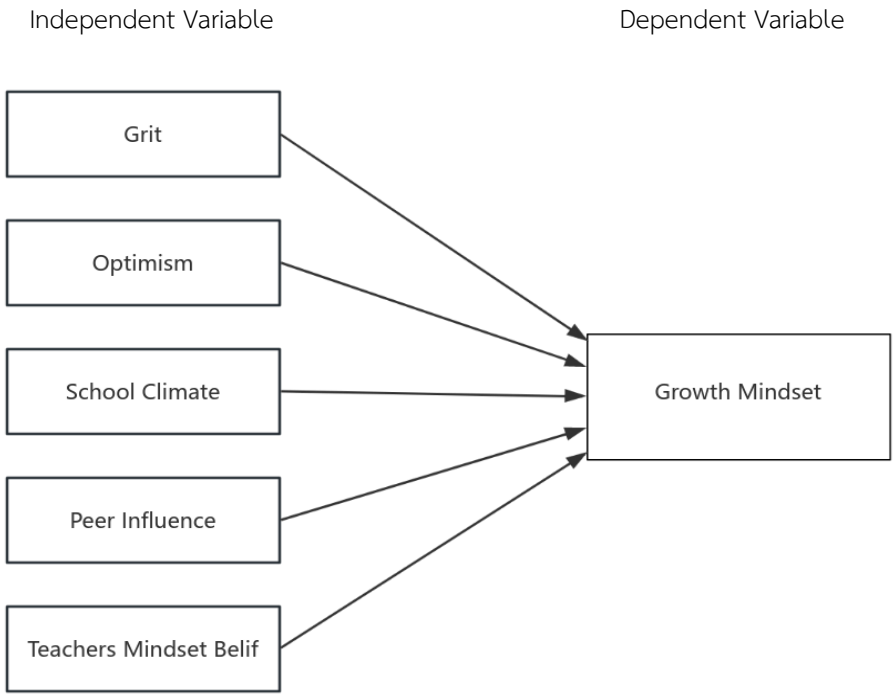
4)In Limeri's (2020) study, students reported that witnessing their peers fail or persevere in the face of challenges led to changes in their beliefs about the malleability of intelligence (Limeri et al., 2020). In collectivist cultural contexts, peer groups that emphasize academic effort can promote the development of a growth mindset, whereas highly competitive or comparison-driven environments may reinforce a fixed mindset (Zhu et al., 2024).

5)Teachers play a crucial role in shaping students' beliefs about their own abilities (Rubie-Davies, 2014). Research by Ommundsen has shown that perceived teacher autonomy support is positively associated with a growth mindset among both secondary and university students. Students who tend to endorse a growth mindset are more likely to believe that their teachers hold growth-oriented beliefs; the same pattern is observed among students who endorse a fixed mindset (Kroeper et al., 2022).

In summary, previous studies have identified five key factors influencing the development of a growth mindset. However, few have integrated these variables into a comprehensive framework, particularly within the cultural context of Chinese higher education. To address this gap, the present study draws on Bandura's Social Cognitive Theory, which emphasizes the reciprocal interaction between personal factors, environmental influences, and behavior. Within this theoretical framework, a growth mindset is shaped not only by individual traits such as grit and optimism, but also by contextual factors including school climate, teacher beliefs, and peer culture. Through social learning—observing the behaviors and attitudes of others (e.g., teachers and peers)—individuals continuously adjust their beliefs about the malleability of their abilities based on feedback and experiences.

Conceptual Framework

See Figure 1



Research Methodology

1) This research adopted a quantitative research method to explore the determinants affecting the growth mindset of adolescents in China. A questionnaire survey was utilized to acquire data pertaining to the assessment of growth mindset and the factors affecting it among adolescents in China. Data collection was conducted online over a one-week period. A total of 350 students were invited to complete the questionnaire through an online survey platform. All responses were submitted electronically, and the collected data were subsequently exported from the platform and subjected to statistical analysis.

2) Research Variable

The independent variables of the study are grit, optimism, school climate, peer influence, and teacher mindset belief. The dependent variable is growth mindset.

3) Research Tool

The present research developed a Likert 5-point scale questionnaire, namely growth mindset and factors affecting growth mindset questionnaire. The questionnaire was divided into six sections based on the variables of this study, with a total of 65 items. Drawing upon mature scales, the design of the items within each section were tailored to the actual growth mindset of Chinese adolescent students. The content validity of the questionnaire was evaluated using the Index of Item-Objective Congruence (IOC), reviewed by three experts in the relevant field. The items that had scores higher than or equal to 0.5 were reserved. Based on the experts' IOC ratings, the items in the questionnaire were carefully reviewed. Detailed results of the validity and reliability (See Table 1) are described below. 1) In the Growth mindset (9 items), IOC values were all 1; Cronbach's Alpha value was 0.740; CICT values ranged from 0.321 to 0.484. 2) In the Grit section (9 items), IOC values were all 1; Cronbach's Alpha value was 0.745; CICT values ranged from 0.284 to 0.593. 3) In the Optimism section (8 items), IOC values were all 1; Cronbach's Alpha value was 0.774, CICT values ranged from 0.264 to 0.703. 4) In the school climate section (23 items), IOC values were all 1; Cronbach's Alpha value was 0.924, CICT values ranged from 0.307 to 0.715. 5) In the peer influence (8 items), IOC values were all 1; Cronbach's Alpha value was 0.715, CICT values ranged from 0.247 to 0.547. 6) In the Teachers' Mindset Beliefs (8 items), IOC values were all 1; Cronbach's Alpha value was 0.785, CICT values ranged from 0.295 to 0.688. The overall Cronbach's Alpha value of the entire questionnaire scale was 0.924, reflecting a great level of reliability.

4)Data analysis

Correlation Analysis: The relationships between the dependent variable, growth mindset, and the independent variables — grit, optimism, school climate, peer influence, and teachers' mindset belief will be examined. The correlation coefficient's sign and magnitude will be used to determine the strength and direction of the relationship between each factor and growth mindset.

Multiple Stepwise Regression Analysis: The impact of independent variables: grit, optimism, school climate, peer influence, and teachers' mindset beliefs on the dependent variable students' growth mindset will be examined.

Results

Based on the analysis of the available data and the variables, The researchers identified the key factors that have the most significant impact on the growth mindset of adolescents in the School of Management at a university.

TABLE 1 Correlation Coefficient between the Factors Affecting Growth Mindset

	Y	X1	X2	X3	X4	X5
Y	1					
X1	.661**	1				
X2	.604**	.523**	1			
X3	.639**	.585**	.574**	1		
X4	.619**	.589**	.568**	.731**	1	
X5	.705**	.551**	.507**	.729**	.642**	1

** Correlation is significant at the 0.01 level.

Pearson correlation analysis was employed to examine the correlation between the five influencing factors and Growth Mindset. In Table 1, the degree of correlation between two variables is represented by the correlation coefficient, which ranged from 0.604 to 0.705. Among them, Grit (X1) showed a significant positive correlation with Growth Mindset ($r = .661$, $p < .01$). Optimism (X2) exhibited a significant positive correlation with Growth Mindset ($r = .604$, $p < .01$). School Climate (X3) demonstrated a significant positive correlation with Growth Mindset ($r = .639$, $p < .01$). Peer Influence (X4) was similarly positively correlated with Growth Mindset ($r = .619$, $p < .01$). All significant correlations are reported at the 0.01 level (two-tailed). This indicates that these factors are not only statistically linked to growth mindset but also exhibit substantial practical significance within the educational context. These findings align

robustly with established theoretical foundations. The strongest correlation emerged between Teachers' Mindset Belief (X5) and Growth Mindset (*r* = .705), which strongly supports Dweck's (2006) core tenet that educators' own beliefs about malleable intelligence critically shape the mindset culture of the learning environment they create for students. China's traditionally hierarchical and teacher-respecting educational culture (Yang, 2020) likely amplifies the influence of educators' attitudes, making their mindset beliefs particularly potent determinants of student mindset development compared to some Western settings.

TABLE 2 Analysis of Variance of the Growth Mindset

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.801a	0.642	0.637	0.40446

As shown in Table 10, the overall R value of the regression model is 0.801, indicating a strong correlation between the independent variables and the dependent variable. The coefficient of determination (R^2) is 0.642, suggesting that the independent variables collectively explain 64.2% of the variance in growth mindset. The adjusted R^2 value is 0.637, providing a more conservative estimate of the model's explanatory power by adjusting for the number of predictors included in the model. The standard error of the estimate is 0.40446, which reflects the average distance between the predicted and observed values of the dependent variable.

TABLE 3 Predictive Factor Analysis of Growth Mindset

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.152	1.313		0.115	0.908
	X1	0.308	0.046	0.289	6.691	< .001***
	X2	0.243	0.049	0.208	4.944	< .001***
	X3	0.009	0.024	0.022	0.389	0.698
	X4	0.095	0.068	0.072	1.407	0.160
	X5	0.455	0.059	0.379	7.689	< .001***

*** p<.001

Table 12 presents the significance test of the regression coefficients of the model's independent variables. From the results, it was observed that there are three factors with p-values corresponding to the t-values of the regression coefficients that were less than the significance level of 0.001. These factors, ranked from most to least influential, are as follows: Teachers' Mindset Belief (β = 0.379), Grit (β = 0.289), and Optimism (β = 0.208). Based on these findings, the following regression equations can be formulated:

The unstandardized regression equation can be formulated as:

$\hat{Y}=0.152 + 0.308X_1 + 0.243X_2 + 0.455X_5$

The standardized regression equation is as follows:

$Z= 0.289X_1 + 0.208X_2 + 0.379X_5$

Discussion

1. The correlation analysis revealed that all five influencing factors pertaining to the Growth mindset of students are significantly associated at 0.01 level. These factors include 1) grit, 2) optimism, 3) school climate, 4) peer influence, 5) teacher mindset beliefs

1) Grit positively correlates with a growth mindset, with a correlation coefficient of 0.661 ($p < 0.01$). This finding is consistent with the study by (Duckworth et al., 2007). In educational settings, gritty students maintain confidence in their capacity to overcome obstacles through sustained effort and strategy adjustment, rather than attributing difficulties to fixed ability limitations. Their characteristic ability to delay gratification and connect current efforts with future outcomes further exemplifies this growth-oriented approach to learning.

2)Optimism is significantly positively correlated with growth mindset, with a correlation coefficient of 0.604 ($p < 0.01$). This result is consistent with the findings of Dardick (2019). Drawing from Seligman's (2006) concept of learned optimism, optimistic individuals are more likely to attribute setbacks to temporary, external, or specific causes, rather than pervasive internal factors. This attribution style mirrors the growth mindset's view of failures as opportunities for learning and improvement, rather than indicators of inherent limitations. Conversely, a fixed mindset may lead to learned helplessness when challenges arise, where individuals doubt their agency to change outcomes, a point this section touches upon effectively with Scheier (2024).

3) School climate is significantly positively correlated with growth mindset, with a correlation coefficient of 0.639 ($p < 0.01$). This finding supports the research of Wang and Degol (2016) as well as Chen and Zhang (2024), who emphasized the critical role of

a positive school climate in shaping students' academic attitudes and beliefs. Like other motivational constructs, students' mindsets are highly susceptible to environmental influences (Yu et al., 2022). When schools emphasize effort, process, and progress over innate talent, they cultivate an environment where students feel safe to take academic risks and learn from mistakes. This aligns with socio-cultural theories of learning, where the learning environment is not merely a backdrop but an active participant in shaping students' cognitive and motivational structures. In such an environment, students are more likely to view challenges as opportunities for growth rather than threats to avoid.

4)Peer influence is significantly positively correlated with growth mindset, with a correlation coefficient of 0.619 ($p < 0.01$). During adolescence, peer influence is especially important as it shapes many aspects of young people's lives, including social norms, academic achievement, and personal values (Laursen & Veenstra, 2021). This influence is dual in nature. When peers demonstrate behaviors such as effort, perseverance, and a willingness to embrace challenges, they exert a positive influence. Peer encouragement and academic collaboration further strengthen students' confidence in overcoming obstacles and help foster a shared sense of academic purpose. Conversely, when peers exhibit negative attitudes toward learning, avoid difficult tasks, or ridicule failure, their influence can be detrimental promoting the belief that failure stems from a lack of innate intelligence.

5)Teacher mindset beliefs are significantly positively correlated with growth mindset, with a correlation coefficient of 0.705 ($p < 0.01$). This result is consistent with previous research by Dweck (2012), which found that teachers with a growth mindset are more likely to adopt diverse instructional strategies to meet the varying needs of their students. They create positive learning environments that encourage exploration and experimentation, and they help students develop problem-solving skills. Such teachers provide constructive feedback, set high yet attainable expectations, and encourage students to view mistakes as learning opportunities.

2. The regression analysis revealed that three factors influenced students' growth mindset. These factors include 1) teacher mindset beliefs, 2) grit, 3) optimism, exhibiting statistical significance at the 0.001 level.

1) The factor of teacher mindset beliefs significantly influenced the growth mindset of adolescents, with a standardized beta value of 0.379 ($p < 0.001$), ranking as the most influential predictor among the three significant variables. In this study, more than half of the surveyed students reported that when teachers explicitly conveyed beliefs about the malleability of intelligence and ability, students were more likely to internalize those beliefs. When students feel that their teachers believe in their capacity to grow, they are more likely to believe in their own potential, which in turn enhances their motivation and engagement in learning (Nalipay et al., 2022). By teaching students how the brain works and implementing strategies such as cooperative learning and positive education, teachers can significantly influence the development of students' growth mindset (Yu et al., 2022).

2) The factor of grit significantly influenced adolescents' growth mindset, with a standardized beta value of 0.289 ($p < 0.001$), which was the second most influential predictor in the regression model. In this study, more than half of the surveyed students reported that they were able to persist through challenges, overcome difficulties, and remain committed to achieving long-term academic goals. Individuals with high levels of grit are more likely to engage in deliberate practice, which helps them improve their skills. Over time, they accumulate mastery experiences that "prove" to themselves that hard work and taking on challenges will ultimately lead to rewards (Duckworth et al., 2007).

3) The factor of optimism significantly influenced the growth mindset of adolescents, with a standardized beta value of 0.208 ($p < 0.001$), ranking as the third most influential predictor among the five significant variables in the regression model. In this study, more than half of the surveyed students expressed confidence in their ability to overcome difficulties and believed that positive outcomes awaited them in the future. Students' positive expectations for the future strengthen their beliefs in their capacity to grow, enabling them to demonstrate greater resilience, stay motivated in the face of challenges, and continue working toward their goals (Dardick & Tuckwillber, 2019). Teachers can cultivate optimism by fostering positive self-talk, guiding incremental goal

setting, and celebrating small wins. This practice strengthens students' belief in their ability to grow and succeed, sustaining both optimism and growth mindset development.

Recommendations

1) Fostering a growth mindset in students is essential for their long-term academic success and personal development. Teachers can effectively support this by guiding students to set specific, process-oriented learning goals that emphasize skill development and incremental progress, rather than focusing solely on final outcomes or perfection. For example, instead of setting a goal to "get an A on the next math test," teachers can help students establish objectives like "master three new problem-solving strategies each week" or "improve my ability to explain mathematical concepts to classmates." By shifting focus from results to the learning process itself, students become more resilient and motivated learners who value continuous improvement.

2) Teachers can effectively develop students' grit by creating a supportive environment where perseverance is valued and long-term goals are broken into achievable steps. Drawing on Angela Duckworth's research, educators should model resilience by sharing their own learning struggles and framing challenges as growth opportunities. By celebrating small wins and emphasizing effort over immediate results, teachers help students understand that sustained effort leads to improvement, ultimately fostering the perseverance and passion that characterize gritty learners.

3) Schools can foster a positive and supportive learning environment that encourages students to approach academic pressure with an optimistic attitude. For students who are easily discouraged or lack confidence, teachers need to show patience and understanding, offering greater encouragement and support to help them adjust their mindset and gradually develop a positive and optimistic outlook on life.

4) When teachers themselves have a growth mindset, they are more likely to adopt teaching methods that encourage students to persevere, demonstrate resilience, and maintain a passion for learning. Classroom feedback should emphasize effort, strategy, and progress, rather than just results. For example, "Your way of trying different methods to verify answers is commendable". Praising students for their problem-solving

methods when facing challenging tasks, or acknowledging their perseverance, reinforces the belief that abilities can be developed through dedication and effort. Therefore, it is recommended that schools provide professional development opportunities and focus on cultivating teachers' understanding and expression of growth thinking.

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