

**GROWTH MINDSET AND ACADEMIC  
ENGAGEMENT AMONG CHINESE UNIVERSITY  
STUDENTS: A SERIAL MEDIATION MODEL  
OF FUTURE TIME PERSPECTIVE AND GRIT**

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ENGAGEMENT AMONG CHINESE UNIVERSITY  
STUDENTS: A SERIAL MEDIATION MODEL  
OF FUTURE TIME PERSPECTIVE AND GRIT**

by

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## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENT</b> .....	<b>ii</b>
<b>TABLE OF CONTENTS</b> .....	<b>iii</b>
<b>LIST OF TABLES</b> .....	<b>viii</b>
<b>LIST OF FIGURES</b> .....	<b>x</b>
<b>LIST OF APPENDICES</b> .....	<b>xi</b>
<b>ABSTRAK</b> .....	<b>xii</b>
<b>ABSTRACT</b> .....	<b>xiv</b>
<b>CHAPTER 1 INTRODUCTION</b> .....	<b>1</b>
1.1 Introduction .....	1
1.2 Research Background .....	3
1.3 Problem Statement .....	11
1.4 Research Objectives .....	16
1.5 Research Questions .....	16
1.6 Research Significance .....	17
1.7 Scope and Limitation .....	18
1.8 Conceptual and Operational Definition .....	20
1.8.1 Growth Mindset .....	20
1.8.2 Future Time Perspective .....	21
1.8.3 Grit .....	22
1.8.4 Academic Engagement .....	24
1.9 Summary .....	25
<b>CHAPTER 2 LITERATURE REVIEW</b> .....	<b>27</b>
2.1 Introduction .....	27
2.2 Academic Engagement .....	27
2.2.1 Defining Academic Engagement .....	27

2.2.2	Dimension and Measurement.....	29
2.2.3	Academic Engagement Among Students.....	34
2.2.3(a)	Individual Factors and Academic Engagement.....	34
2.2.3(b)	School Factors and Academic Engagement.....	38
2.2.3(c)	Family Factors and Academic Engagement.....	43
2.3	Growth Mindset.....	47
2.3.1	Meaning Systems Centered on Mindset.....	47
2.3.2	Structure and measurements.....	51
2.3.3	Growth Mindset Among Students.....	52
2.3.3(a)	Growth Mindset and Academic Achievement.....	52
2.3.3(b)	Growth Mindset and Mental Health.....	60
2.4	Future Time Perspective.....	65
2.4.1	Concepts of Future Time Perspective.....	65
2.4.2	Structure and measurements.....	67
2.4.3	Future Time Perspective Among Students.....	71
2.4.3(a)	Future Time Perspective and Cognition.....	71
2.4.3(b)	Future Time Perspective and Motivation.....	73
2.4.3(c)	Future Time Perspective and Behavior.....	76
2.5	Grit.....	82
2.5.1	Defining Grit.....	82
2.5.2	Structure and measurements.....	84
2.5.3	Grit Among Students.....	86
2.5.3(a)	Factors Influencing Grit.....	86
2.5.3(b)	Predictive Role of Grit.....	94
2.6	Interrelationships between Growth Mindset, Academic Engagement, Future Time Perspective, and Grit among Students.....	99
2.6.1	Growth Mindset and Academic Engagement.....	99
2.6.2	Growth Mindset and Future Time Perspective.....	102

2.6.3	Future Time Perspective and Academic Engagement .....	104
2.6.4	Growth Mindset and Grit .....	107
2.6.5	Grit and Academic Engagement .....	109
2.6.6	Future Time Perspective and Grit .....	111
2.6.7	Possibility of Future Time Perspective and Grit as Mediators .....	112
2.6.8	Possibility of Future Time Perspective and Grit as serial Mediators .....	114
2.7	Research Gap .....	115
2.8	Research Hypotheses .....	115
2.9	The Underlying Theories .....	116
2.9.1	Implicit Theories of Intelligence .....	116
2.9.2	Future Time Perspective Theory .....	118
2.9.3	Grit Theory .....	119
2.9.4	Socioemotional Selectivity Theory .....	120
2.10	Theoretical Framework .....	121
2.11	Conceptual Framework .....	124
2.12	Summary .....	126
<b>CHAPTER 3 METHODOLOGY .....</b>		<b>128</b>
3.1	Introduction .....	128
3.2	Research Design .....	128
3.3	Research Sampling .....	130
3.3.1	Research Population .....	130
3.3.2	Sampling Technique .....	133
3.3.3	Research Sample .....	134
3.4	Research Instruments .....	137
3.4.1	Growth Mindset Scale .....	138
3.4.2	General Future Time Perspective Scale for College Students .....	139
3.4.3	Grit Scale .....	140

3.4.4	Chinese College Student Academic Engagement Questionnaire .....	142
3.5	Pilot Study .....	144
3.5.1	Reliability Analysis .....	147
3.5.2	Validity Analysis .....	147
3.6	Data Collection .....	150
3.7	Statistical Analyses .....	151
3.8	Summary .....	158
<b>CHAPTER 4 RESULTS .....</b>		<b>159</b>
4.1	Introduction .....	159
4.2	Data Screening .....	159
4.3	Sample Characteristics .....	161
4.4	Descriptive Statistics .....	162
4.4.1	Growth Mindset .....	163
4.4.2	Future Time Perspective .....	163
4.4.3	Grit .....	164
4.4.4	Academic Engagement .....	165
4.5	Difference analysis on demographic variables .....	165
4.6	Assessment of Measurement Model .....	167
4.6.1	Reliability .....	167
4.6.2	Convergent Validity .....	170
4.6.3	Discriminant Validity .....	172
4.7	Assessment of Structural Model .....	173
4.7.1	Coefficient of determination ( $R^2$ ) .....	174
4.7.2	Effect Size( $f^2$ ) .....	175
4.7.3	Predictive Relevance( $Q^2$ ) .....	176
4.7.4	Collinearity Assessment .....	177
4.7.5	Direct Effect .....	178

4.7.6	Mediating Effect.....	181
4.8	Key Findings.....	182
4.9	Summary.....	183
<b>CHAPTER 5 DISCUSSION AND CONCLUSIONS.....</b>		<b>184</b>
5.1	Introduction.....	184
5.2	Summary of Research.....	184
5.3	Discussion of Findings.....	186
5.3.1	Current Level of Research Variables.....	186
5.3.2	Difference Analysis.....	194
5.3.3	Mediating Effect of Future Time Perspective.....	199
5.3.4	Mediating Effect of Grit.....	202
5.3.5	Serial Mediating Effect of Future Time Perspective and Grit.....	204
5.4	Implications of the Study.....	207
5.4.1	Theoretical Implications.....	207
5.4.2	Practical Implications.....	209
5.5	Recommendation for Future Research.....	212
5.6	Conclusion.....	213
<b>REFERENCES.....</b>		<b>214</b>
<b>APPENDICES</b>		

## LIST OF TABLES

		<b>Page</b>
Table 2.1	The Impact of Individual Factors on Academic Engagement.....	37
Table 2.2	The Impact of School Factors on Academic Engagement.....	42
Table 2.3	The Impact of Family Factors on Academic Engagement.....	45
Table 2.4	The Impact of Growth Mindset on Academic Achievement.....	57
Table 2.5	The Impact of Growth Mindset on Mental Health.....	63
Table 2.6	The Impact of Future Time Perspective on Cognition.....	72
Table 2.7	The Impact of Future Time Perspective on Motivation.....	75
Table 2.8	The Impact of Future Time Perspective on Behavior.....	79
Table 2.9	The Impact of Some Factors on Grit.....	90
Table 2.10	Some Factors Influenced by Grit.....	96
Table 3.1	Sampling Procedure.....	136
Table 3.2	Number of Undergraduate Students in Stratified Sampling.....	137
Table 3.3	Reliability and Validity Test of Growth Mindset Scale.....	139
Table 3.4	Reliability and Validity Test of The General Future Time Perspective Scale for College Students.....	140
Table 3.5	Reliability and Validity Test of Grit Scale.....	142
Table 3.6	Reliability and Validity Test of Chinese College Student Academic Engagement Questionnaire.....	143
Table 3.7	Internal Consistency Reliability of All Questionnaires.....	147
Table 3.8	Content Validity Index (CVI) of All Questionnaires.....	148
Table 3.9	Convergent Validity-Average Variance Extracted (AVE).....	148
Table 3.10	Discriminant Validity-Heterotrait-Monotrait Ratio.....	149
Table 3.11	Summary of Statistical Analyses.....	155

Table 4.1	Composition of the Undergraduate Sample.....	161
Table 4.2	Descriptive Statistics for Growth Mindset.....	163
Table 4.3	Descriptive Statistics for Future Time Perspective.....	164
Table 4.4	Descriptive Statistics for Grit.....	164
Table 4.5	Descriptive Statistics for Academic Engagement.....	165
Table 4.6	Differences in Academic Engagement across Demographic Variables.....	166
Table 4.7	Findings of Internal Consistency Reliability.....	168
Table 4.8	Factor Loading.....	169
Table 4.9	Average Variance Extracted (AVE).....	171
Table 4.10	Fornell-Larcker Criterion.....	172
Table 4.11	Heterotrait-Monotrait Ratio.....	173
Table 4.12	Coefficient of determination ( $R^2$ ).....	174
Table 4.13	Effect Size( $f^2$ ).....	175
Table 4.14	Summary of Predictive Relevance.....	176
Table 4.15	Collinearity Statistics(VIF).....	177
Table 4.16	Direct Effects between Variables.....	180
Table 4.17	Hypothesis Testing for Mediating Effects.....	182
Table 4.18	Summary of Quantitative Results.....	183

## LIST OF FIGURES

	<b>Page</b>
Figure 2.1	Theoretical Framework..... 122
Figure 2.2	Hayes' Model of Serial Mediation..... 124
Figure 2.3	The Conceptual Framework..... 125
Figure 3.1	Flowchart of Data Collection..... 151
Figure 3.2	Flowchart of Statistical Analyses..... 156
Figure 4.1	Measurement Model Path Diagram..... 179

## **LIST OF APPENDICES**

- APPENDIX A GROWTH MINDSET SCALE
- APPENDIX B THE GENERAL FUTURE TIME PERSPECTIVE SCALE
- APPENDIX C GRIT SCALE
- APPENDIX D CHINESE COLLEGE STUDENT ACADEMIC ENGAGEMENT QUESTIONNAIRE
- APPENDIX E SCALE PERMISSION
- APPENDIX F ETHICAL APPROVAL
- APPENDIX G CHINESE VERSION OF THE QUESTIONNAIRE
- APPENDIX H MINIMUM SAMPLE SIZE CALCULATION BY G\*POWER
- APPENDIX I DATA ANALYSIS RESULTS OF THE PILOT STUDY
- APPENDIX J DATA ANALYSIS RESULTS OF THE FORMAL STUDY

**PERKEMBANGAN PEMIKIRAN DAN PENGLIBATAN AKADEMIK  
DALAM KALANGAN PELAJAR UNIVERSITI DI CHINA: MODEL  
PENGANTARAAN BERSIRI PERSPEKTIF MASA HADAPAN DAN GRIT**

**ABSTRAK**

Apabila pelajar universiti memperoleh lebih banyak autonomi, perkembangan pemikiran menjadi semakin penting untuk meningkatkan penglibatan akademik mereka. Berdasarkan Teori Kecerdasan Implisit, Teori Perspektif Masa Masa Depan, Teori Selektif Sosioemosi, dan Teori Grit, kajian ini bertujuan untuk meneroka kesan pengantaraan bersiri perspektif masa hadapan dan grit di antara perkembangan pemikiran dengan penglibatan akademik dalam kalangan pelajar ijazah pertama di China. Soalan kajian melibatkan penyiasatan terhadap tahap semasa perkembangan pemikiran, perspektif masa hadapan, grit dan penglibatan akademik, ujian perbezaan dalam penglibatan akademik pada pembolehubah demografi, dan peranan pengantara perspektif masa hadapan dan Grit dalam hubungan antara perkembangan pemikiran dan penglibatan akademik. Kaedah kuantitatif digunakan dalam kajian ini dengan menggunakan Skala Perkembangan pemikiran (GMS), Skala Perspektif Masa Masa Depan Umum untuk Pelajar Kolej (GFTPSCS), Skala Grit (GS) dan Soal Selidik Penglibatan Akademik Pelajar Kolej Cina (CCSAEQ) ditadbirkan kepada 600 pelajar ijazah pertama di China. Ini menghasilkan saiz sampel akhir sebanyak 565 responden untuk tujuan analisis. Data telah dianalisis menggunakan perisian statistik bagi menguji kebolehpercayaan, kesahan dan tahap kesesuaian model. Keputusan dari analisis data dibentangkan berdasarkan soalan kajian, termasuk tahap min bagi setiap pembolehubah, ujian untuk perbezaan penglibatan akademik pada pembolehubah demografi, dan ujian untuk menguji kesan pengantaraan bagi tiga hubungan dalam

model. Keputusan menunjukkan bahawa perkembangan pemikiran pelajar ijazah pertama di China, perspektif masa hadapan, grit, dan penglibatan akademik berada di peringkat pertengahan atas. Penglibatan akademik berbeza dengan ketara mengikut jantina, manakala tiada perbezaan ketara wujud dalam lokasi kediaman, bidang pengkhususan dan ijazah sarjana muda. Perspektif masa hadapan dan grit bukan sahaja dapat menjadi pengantara kesan perkembangan pemikiran pada penglibatan akademik secara individu, tetapi juga untuk membentuk pengantara bersiri. Kajian ini memperluas penyelidikan sedia ada dengan mengkaji perspektif masa hadapan dan grit sebagai pemboleh ubah pengantara dalam hubungan antara pemikiran berkembang dan penglibatan akademik.

**GROWTH MINDSET AND ACADEMIC ENGAGEMENT AMONG  
CHINESE UNIVERSITY STUDENTS: A SERIAL MEDIATION MODEL OF  
FUTURE TIME PERSPECTIVE AND GRIT**

**ABSTRACT**

As university students gain autonomy, fostering a growth mindset becomes increasingly crucial for enhancing their academic engagement. Drawing on Implicit Theories of Intelligence, Future Time Perspective Theory, Socioemotional Selectivity Theory, and Grit Theory, this study aimed to investigate the serial mediating role of future time perspective and grit in the growth mindset–academic engagement link among Chinese university undergraduate students. The research questions involved investigation of the current levels of growth mindset, future time perspective, grit and academic engagement, the tests of differences in academic engagement on demographic variables, and the mediating role of future time perspective and grit in the relationship between growth mindset and academic engagement. Quantitative method was used in this study by employing the Growth Mindset Scale (GMS), General Future Time Perspective Scale for College Students (GFTPSCS), Grit Scale (GS) and Chinese College Student Academic Engagement Questionnaire (CCSAEQ) to 600 Chinese undergraduate students. Resulting in a final sample size of 565 respondents for analysis purposes. Data were analyzed using statistical software for reliability, validity testing and goodness of fit. Data results are presented based on the research questions, including mean levels for each variable, tests for differences in academic engagement on demographic variables, and tests for mediating effects of the three pathways in the model. The results showed that Chinese university students' growth mindset, future time perspective, grit, and

academic engagement were in the upper middle level. Academic engagement differed significantly by gender, while no significant differences existed at location of residence, major and undergraduate levels. Future time perspective and grit were not only able to mediate the effect of growth mindset on academic engagement individually, but also to form a serial mediator. This study extends existing research by examining future time perspective and grit as mediators in the growth mindset–academic engagement relationship.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

In the process of school education, students' active engagement in their own learning becomes the most direct expression of their subjectivity. The purpose of focusing on academic engagement is to examine the extent to which students are taking full advantage of their own initiative as a way to fully understand the development of student subjectivity. Increasing the level of student engagement becomes an important breakthrough point for achieving the goal of subjective education in actual teaching. Moreover, academic engagement not only helps students to be motivated and active in their learning tasks, but also positively influences their academic performance, which makes engagement an important factor in the quality of learning (Sahni, 2023; Senior et al., 2018).

Mindsets are the ways of thinking and approaches that humans adopt when faced with information, knowledge, and problems. Individuals' behavioral styles are governed and regulated by intrinsic thinking patterns, and different thinking patterns lead individuals to develop different cognitive and behavioral patterns (Nishimura et al., 2012). Individuals with a growth mindset are convinced that abilities can be developed through continuous effort at a later stage, whereas intelligence is of an unknown nature, and both are characterized by growth, plasticity, and control (Dweck, 2006). In learning contexts, students with a growth mindset focus on self-improvement and progress, believe in the value of effort and enjoy the process of learning and self-improvement, have stronger motivation and more proactive learning behaviors, and thus remain more engaged in their academic goals (Blackwell et al., 2007; Zeng et al., 2016). According to Abubakar et al. (2017),

student engagement is one of the best predictors of academic performance and personal development. The information gathered from the study on the mechanism of the effect of growth mindset on academic engagement among college students will help universities and families to further think about how to stimulate and develop growth mindset in order to better promote the development of student autonomy and improve the quality of education.

However, exploring only the direct relationship between growth mindset and academic engagement may not fully reveal its underlying mechanisms. Therefore, this study introduces future time perspective and grit as serial mediators to further examine how growth mindset influences academic engagement. Future time perspective refers to an individual's focus on future goals and its guiding role in current behaviors (Husman & Shell, 2008). Grit refers to an individual's perseverance and passion for achieving long-term goals, encompassing sustained interest and continuous effort (Duckworth et al., 2007). Growth mindset contributes to the development of future time perspective, as individuals who believe in the malleability of their abilities are more likely to focus on long-term growth and perceive effort as essential for future success (Zhao et al., 2022). Furthermore, individuals with a strong future time perspective are more likely to persist in their long-term goals and maintain high levels of grit and self-discipline when facing challenges (Cao et al., 2023). Students with higher levels of grit demonstrate greater endurance and proactivity in academic tasks, thereby enhancing their academic engagement (Rouhi et al., 2022).

The purpose of this dissertation is to explore the relationship between the interactions of various variables in the hypothesized model. This chapter presents the

research background and problem statement of the study, based on which the research objectives are outlined and the corresponding research questions are formulated, and the scope and limitations of the study are illustrated. Finally, the terms used in the study are defined conceptually and operationally.

## **1.2 Research Background**

For the development of the individual, education helps to recognize the things around and perceive the inner world, develops the intellect, fosters intellectual and moral qualities in line with norms, and develops one's own unique abilities and personality (Hallinan, 2006). For nations and human societies, individuals developed through effective education have great potential to contribute to economic growth (Wobbekind, 2012). This knowledgeable and skilled workforce may develop more efficient production methods in the future to create economic prosperity in more innovative way (Shust et al., 2022). Consequently, many countries around the world invest considerable amounts of resources in their education systems in order to promote the development of education and the improvement of its quality. Higher education is a social activity of developing advanced specialists in an orderly manner by imparting profound knowledge. From a humanistic perspective, higher education is purely for the purpose of promoting the all-round development of human beings and making them better. And from the perspective of the state and society, higher education is a practical activity to cultivate high-level specialists for the state and society. However, whether with an idealized color or with a realist tendency of purpose, the commonality of these two views can be summarized as talent cultivation is always the fundamental attribute of higher education (Cui, 2023). Students are provided with high-level educational opportunities that significantly enrich and

enhance their knowledge base and overall quality. The mechanism of talent cultivation in higher education not only effectively promotes the development and progress of society, but also contributes to the talent pool for scientific research.

Since the implementation of the enrollment expansion policy in 1999, the scale of higher education in China has made successive leaps from the elitist stage to the popularization stage (Bie & Yi, 2014). Statistics show that the total size of China's higher education students reached 46.55 million in 2022 (Xinhua News Agency, 2023). While the rapid growth in size is remarkable, it also raises concerns about the quality of higher education. Firstly, after students enter the college level, the new learning environment is more difficult in terms of knowledge, less teaching time and faster course progress. Many students can't absorb and understand the knowledge quickly in a short period of time, and this pressure will reduce their interest in learning. Second, college students have broken away from the learning mode of high school's intense test-based education, their learning behavior has changed from being supervised and assisted by parents and schools to relying on more self-control to complete. This stage of transition leads to a significant decline in their enthusiasm for learning, and generates learning slack (Long & Ni, 2020). Lastly, the university stage is a crucial period for exporting talents to society. College students are gradually connecting with society, and their career decision-making and planning of life goals are particularly important. However, weak awareness of time management and inefficient use of time are common among the college student population, and the tendency to be bored with studies and addiction to mobile phones have seriously diminished their self-discipline (Liu et al., 2023). In the results of the survey about the deviant behavior of college students, it was shown that in the level of awareness of deviant behavior, 51.1% of students believed that skipping classes

had an average impact. 25% of the students often have to do something unrelated to class, 39.8% of the students sometimes have the idea of skipping class, and 58% of the students have not participated in academic activities. From the data, it can be seen that college students do not really utilize school resources effectively, and the learning situation is not optimistic (Guo et al., 2022). Thus, improving the quality of higher education has become a focus of attention nowadays.

Ensuring student gains and personal development in the learning process is central to improving the quality of education, and the key to achieving learning outcomes is whether students are actively engaged in their academic activities (Lei et al., 2018). For the purpose of building a country with strong comprehensive educational strength and improving the quality of education, China's Ministry of Education emphasized in the "Notice on the Implementation of the Spirit of the Conference on Undergraduate Education in New Era" that higher education institutions should strengthen the management of the learning process in order to change the phenomenon of students' lack of energy and academic commitment (Ministry of Education of the People's Republic of China, 2018). "Opinions on deepening the reform of undergraduate education and teaching to comprehensively improve the quality of talent training" similarly states that higher education institutions should enhance academic challenges, motivate students to study hard, increase the time students devote to their studies, and improve their motivation for independent learning (Ministry of Education of the People's Republic of China, 2019). Therefore, one of the key indicators of the quality of education and the state of student development is student engagement. Student engagement refers to the level of attention, curiosity, interest, optimism, and passion students demonstrate when learning or being taught, which extends to their level of motivation to learn and

progress in education. Student engagement goes beyond the superficial act of completing required assignments or taking exams; it is more important that students have a spontaneous willingness to learn, to recognize the value of learning and to explore it with interest (Ali & Hassan, 2018).

The meaning of engagement encompasses the act of participating and the emotion of actively giving (Sinatra et al., 2015). The topic of student engagement has generated a lot of theoretical and empirical research. The results of these studies consistently find that student engagement is a value-added process that can lead to many positive learning outcomes. For example, student engagement has a positive impact on academic coping and persistence, academic performance, and life satisfaction (Argyriou et al., 2022; Safira & Monika, 2020; Siu et al., 2023). If most students are actively engaged in the classroom environment, more energy is generated to give back to their peers or teachers (Havik & Westergård, 2020). Moreover, student engagement is an important observer of students' learning process that can influence students' compliance with school order and help reduce the likelihood of juvenile delinquency (Galugu and Samsinar, 2019).

In the higher education setting, the level of engagement of university students in their studies determines whether they are able to acquire expertise and achieve good academic success during their university years, which will affect their future career development and is related to their ability to survive once they enter society (Datu & Buenconsejo, 2021). Although engagement is critical, students are not always fully autonomous in their academic activities. Engagement implies that the individual is committed to the education received. The ability to gain a wealth of knowledge and develop competencies or skills from a university education depends

on the student's own choices. Therefore, exploring the mechanisms inherent in promoting college student engagement is an important prerequisite for achieving current educational objectives.

Much of the current research on influencing student engagement focuses on external factors, such as teacher support, parental support, peer relationships, and campus climate (Gunuc et al., 2022; Shao & Kang, 2022; Xu, 2023), whereas the exploration of intra-individual factors influencing engagement needs to be deepened. When faced with the realities of daily life and learning, there is considerable variability in the specific behaviors exhibited by different students, even for the same problem. An individual's perceptions are a key factor in influencing behavior (Duncan & Barrett, 2007). The "self theory" believes that a shift in the pattern of thinking can cause a change in the way people perceive, the way they act, and the ultimate outcome. In academic contexts, mindsets can help students construct a coherent system of meaning, which in turn influences how students attribute, set goals, and put forth effort (Dweck & Grant, 2008).

Can intelligence and ability change? Individuals' different answers and beliefs to this question each represent two mindsets, the fixed mindset and the growth mindset. Individuals with a fixed mindset treat intelligence and ability as innate gifts, believing that gifts are unchangeable and fixed in nature. They tend to avoid challenges, fear failure, and attribute any setbacks to a lack of self-efficacy, making it difficult for them to do something consistently. Growth mindset individuals, on the contrary, believe that abilities and intelligence are unknown as well as variable, and that they can be molded and enhanced through continuous hard work and learning. They are willing to take on challenging tasks and are adept at

learning from failure, believing that hard work and appropriate strategies can bring them success (Dweck, 2006; Dweck & Yeager, 2019). It is the quest for self-improvement and self-growth that stimulates internal learning motivation in growth mindset individuals, causing them to actively set goals for themselves and remain highly engaged (Zhao et al., 2022).

Reviewing past research, the positive impact of growth mindset on engagement has gained the attention of several scholars. Regarding the indirect path through which the growth mindset can predict academic engagement, many studies have proposed different influencing mechanisms. For example, some mediating or moderating variables have been introduced into the relationship between growth mindset and academic engagement, including perceived stress, second language motivational self-system, boredom, grit (Derakhshan et al., 2022; Liu, 2022b; Sadoughi et al., 2023; Zhao et al., 2021). However, whether there are other internal mechanisms involved remains to be explored in depth.

Different perceptions of time lead individuals to develop different perspectives that influence attitudes and behavioral decisions about time. Time perspectives include retrospective thinking about past time and anticipation and conceptualization of future events (McInerney, 2004). Zimbardo et al. (1997) proposed that future-oriented psychological time zones are more likely to trigger positive human behavior. As a stable personality trait, future time perspective is manifested in the cognitive, affective experiences, and action tendencies exhibited by individuals planning for future self-development (Jiang & Lv, 2017).

Both the growth mindset and the future time perspective are inherently future-oriented at their core. Individuals with a growth mindset believe that they can

improve as long as they keep investing effort and time, so they maintain a more optimistic view of the future, tend to set future-oriented mastery goals, and consider longer-term planning (Dweck, 2011), which is a concrete expression of the future time perspective (Lens et al., 2012). According to Zhao et al. (2022), growth mindset is an important psychological basis for the emergence of future time perspective, and this mindset influences students' perceptions and plans for the future. During the learning process, future orientation makes students think more about the connection between the future and current behaviors which stimulates them to produce positive learning behaviors. Research has shown that future time perspective positively predicts academic engagement (Sun et al., 2020).

Grit, as a positive personality quality, encompasses both an individual's enduring enthusiasm for long-term goals and persistent effort (Duckworth & Quinn, 2009). Dweck and Leggett (1988) proposed in the theory of achievement goals that individuals with a growth mindset have a mastery of goal orientation, they firmly believe in the meaning of hard work and can continue to pay for achieving goals, and their level of grit is higher. Duckworth et al. (2007) similarly showed that a growth mindset can influence grit. When individuals believe that intelligence and ability can be improved with training and practice, they will not be frustrated by temporary setbacks, but will actively search for effective strategies to solve problems and persistently work toward their goals, thus showing a high degree of grit. Cultivating a growth mindset is one of the effective ways to build a gritty personality (Zhao et al., 2022).

Grit contains tremendous positive energy. According to the character strengths theory (Peterson & Seligman, 2004), positive personality traits can

positively influence people's cognition, emotion, and behavior, and thus play a dominant role. Grit, as an excellent trait, promotes positive cognition and emotion, which in turn leads to positive behavior. Individuals with higher levels of grit will keep pushing forward for the realization of long-term goals, will not give up easily even when encountering learning difficulties or interruptions, and will be more likely to overcome difficulties and challenges, and gain confidence and satisfaction, which help to enhance their intrinsic motivation, and thus be more actively engaged in learning activities (Liu, 2020).

Future time perspective as a personality trait of an individual's cognitive, affective, and behavioral dispositions toward the possibility of future self-development reflects how the individual views future goals (Huang, 2004). Future time orientation, which emphasizes a focus on long-term perspectives, is congruent with the nature of the grit personality (sustained interest in and adherence to long-term goals). It has been pointed out that there is a significant positive correlation between future time perspective and grit (Zhao et al., 2022), and students with a high level of future time perspective are full of vision and confidence in their future prospects, have a clearer and more reasonable vision of the future, are more concerned about the long-term goals of their lives and are willing to take action, as well as being able to persevere in the face of difficulties, thus displaying a high level of grit.

Combining the above existing research on the relationship between the four variables, this study will introduce the future time perspective and grit as mediating variables as a way to explore the mechanism of growth mindset's effect on college students' academic engagement.

### **1.3 Problem Statement**

One of the most effective ways to improve the quality of education is to increase student engagement (Christenson et al., 2012). Engagement in learning is a psychological process that is a mediating variable of situational factors acting on learning achievement, which is specified as students' effort, interest, enjoyment, and total engagement (Long & Ni, 2020). Engagement not only measures the quality of the student learning process but is also an important predictor of academic performance (Argyriou et al., 2022). Compared to students with high levels of engagement, students with low levels of engagement have poor academic expectations, perform less well academically, are more easily experienced with negative emotions such as anxiety and boredom, and are more likely to exhibit disruptive behaviors (Jules et al., 2021) or even lead to dropping out of school (Liu et al., 2018).

The current state of students' academic engagement in Chinese universities is concerning, with truancy behavior having a particularly significant negative impact. Li and Wu (2023) conducted semi-structured interviews with five college students with 80% truancy, all of whom rationalized their truancy by placing a low value on the classroom and believing that they could make up for the course content during other free time. Zhao (2023) conducted a mixed-methods study on college students' online truancy behavior. Nineteen students with prior experience of online truancy participated in in-depth interviews, followed by a questionnaire survey administered to 122 students with similar experiences. The data showed that more than 30% of the students had ever engaged in online truancy behavior. Hidden truancy is more prevalent in college than explicit truancy. It refers to students attending class on time but engaging only superficially or passively. Although they are physically present in

every class, they disregard the instructor and participate in non-learning-related activities (Xiao & Xiao, 2020). Another survey of college students revealed that the most frequent classroom problem behaviors were inattention and silence in class (Ma et al., 2020). The negative impact of this psychological absenteeism on the quality of teaching and learning is insidious but significant. Tong et al. (2022) surveyed 189 first-year undergraduates in the School of Mathematics and Statistics of a university and found that the average score of college students' time engagement was only 2.71, and the average score of goal motivation was 2.07. They spend more time on leisure and recreation or sports activities, as well as remain in a state of confusion at the stage of enrollment and do not set up a clear learning goal, thus leading to a lack of motivation and interest in learning. Moreover, a lack of engagement also disrupts university students' learning efficiency. On one hand, students create an "illusion of effort" through "inefficient busyness," such as spending long hours in the library while frequently checking their phones, resulting in insufficient effective study time. On the other hand, many students are addicted to their phones, seeking instant gratification through apps (e.g., short videos, social media), whereas learning requires delayed satisfaction. Since the brain prefers short-term stimulation, this leads to fragmented study time and difficulty concentrating (B. Gao et al., 2021). More seriously, in recent years, an increasing number of university students have been placed on academic warning or withdrawn from their studies due to academic problems or other malpractice issues, and the incidence of academic failure is in the range of 15-53% (Ajjawi et al., 2019; Sandoval-Palis et al., 2020). Based on the above analysis of the current situation of college students' engagement, how to effectively avoid or reduce the occurrence and growth of students' classroom problematic behaviors and dropouts is an urgent issue in the higher education

environment. Therefore, exploring the internal mechanisms that promote academic engagement is an important prerequisite for achieving educational goals and improving education quality.

Although extensive research has examined the predictors of academic engagement, the demographic differences in engagement remain unclear. Li (2022) and Wang et al. (2021) found significant gender differences, with female university students exhibiting higher behavioral and emotional engagement than males. However, Xie (2020) provided contradictory evidence, suggesting that gender differences in academic engagement are minimal. Findings on undergraduate level are also inconsistent. Li and Chen (2021) reported no significant differences, attributing this to similar course structures and the balancing effect of peer pressure. In contrast, Li (2022) found notable differences, particularly among first- and final-year students, who showed higher engagement. First-year students may engage more due to adaptation needs, while final-year students may increase engagement due to internship and job search pressures. Furthermore, Li (2023) and Xie (2020) identified significant differences in academic engagement across majors, whereas location of residence showed no significant effect, possibly due to the homogeneity of surveyed populations. Current research lacks examination of western China's undergraduate populations. This study will address this gap by incorporating four demographic variables (gender, major, undergraduate level, and location of residence) to identify more precise demographic variation patterns.

Engagement is a changeable, fluid state. Factors affecting academic engagement can be categorized into individual and environmental factors. Individual students' background factors and self-systems shape different learning outcomes

through engagement, including developmental differences in various aspects of academic and non-academic dimensions. Synthesizing the findings of current research, the main intra-individual factors that influence academic engagement involve personality traits, self-efficacy, values, motivation, goals, and beliefs (Myint & Khaing, 2020). Mindset is one of the important intra-individual factors, which are people's beliefs about whether their abilities and traits are malleable (Dweck et al., 1995). According to the Implicit Theories of Intelligence, mindsets govern the way individuals behave, and different mindsets influence individuals to make different choices and actions (Dweck, 2006). Individuals with a growth mindset believe that their intelligence and abilities are not fixed but can be continuously developed through effort, thus pursuing progress and self-growth. Such as setting learning goals autonomously and persisting in them, engaging in learning on multiple cognitive, emotional, and behavioral levels. Thus, growth mindset, as a critically important intra-individual belief, plays an integral role in students' academic engagement in academic environment.

Future Time Perspective Theory emphasizes future orientation and focuses on how individuals view and approach the future (Song, 2004). The future time perspective is an individual's cognitive, emotional, and behavioral dispositions about the possibility of future self-development, reflecting stable beliefs about the future, which enables students to view current activities as a means to achieve future goals. This is consistent with the optimism and positive planning for the future held by growth minded individuals. Grit Theory defines grit as a demonstration of perseverance and sustained enthusiasm in the pursuit of long-term goals, which is an important psychological resource and positive personality trait. The grit personality can be cultivated through the growth mindset with greater resilience (Duckworth,

2016). Socioemotional Selectivity Theory provides an explanation for the association between future time perspective and grit, where an individual's openness to time perception affects the type of goal setting as well as the intensity of action (Carstensen et al., 1999). The future time perspective helps individuals to set clear long-term goals, and specific goals can enhance grit and thus be more motivated to overcome obstacles and persevere in their actions. Furthermore, existing research has found that future time perspective can influence the level of academic engagement (Feng et al., 2021), and grit can also positively affect academic engagement (Derakhshan & Fathi, 2023).

Based on the above research, it can be seen that growth mindset is an important factor affecting academic engagement. However, a literature search revealed a lack of research investigating the possible roles of future time perspective and grit in the mechanisms through which a growth mindset influences academic engagement. It includes the respective contributions of future time perspective and grit as mediating variables in the relationship between growth mindset and academic engagement, as well as the possibility of these factors forming a serial mediation pathway. These questions deserve further verification. In addition, most studies on growth mindset and academic engagement have published limited survey data on university students. It is worth noting that university students are in a critical transition period towards society. They have both the identity of students and the characteristics of adults, and their academic engagement will have a direct impact on their future career development. Thus, examining the impact of growth mindset on academic engagement among university students may provide new insights for understanding the long-term role of this concept.

#### **1.4 Research Objectives**

The specific research objectives are divided into the following categories:

1. To examine the current levels of growth mindset, academic engagement (behavioral engagement, cognitive engagement and emotional engagement), future time perspective (future image, future efficacy, future purpose consciousness, far-goal orientation and behavioral commitment) and grit (perseverance of effort and consistency of interests) among Chinese undergraduate students.

2. To examine variations in academic engagement based on demographic factors (gender, major, undergraduate level, and location of residence) among Chinese undergraduate students.

3. To examine the mediating effect of future time perspective on the relationship between growth mindset and academic engagement among Chinese undergraduate students.

4. To examine the mediating effect of grit on the relationship between growth mindset and academic engagement among Chinese undergraduate students.

5. To examine the serial mediating effect of future time perspective and grit on the relationship between growth mindset and academic engagement among Chinese undergraduate students.

#### **1.5 Research Questions**

The following questions are formulated based on the aforementioned objectives:

1. What are the current levels of growth mindset, academic engagement (behavioral engagement, cognitive engagement and emotional engagement), future time perspective (future image, future efficacy, future purpose consciousness, far-goal orientation and behavioral commitment) and grit (perseverance of effort and consistency of interests) among Chinese undergraduate students?

2. Does academic engagement differ significantly on demographic variables (gender, major, undergraduate level, and location of residence) among Chinese undergraduate students?

3. Does future time perspective mediate the relationship between growth mindset and academic engagement among Chinese undergraduate students?

4. Does grit mediate the relationship between growth mindset and academic engagement among Chinese undergraduate students?

5. Is there a serial mediating effect of future time perspective and grit on the relationship between growth mindset and academic engagement among Chinese undergraduate students?

## **1.6 Research Significance**

Existing research has established a direct link between growth mindset and academic engagement, but the underlying psychological mechanisms remain insufficiently explored. By introducing future time perspective and grit as sequential mediators, this study advances motivational and self-regulation theories by explaining how a growth mindset fosters long-term goal orientation and persistence, which ultimately enhance academic engagement. This expanded framework

integrates future-oriented motivation and personality traits into the discussion of growth mindset, providing a more comprehensive theoretical model.

This study enriches the existing literature by addressing a key research gap—the sequential mediating role of future time perspective and grit in the relationship between growth mindset and academic engagement. While prior studies have separately examined the effects of future time perspective and grit, their combined influence as a psychological pathway remains underexplored. By empirically testing this serial mediation model, the findings contribute to a deeper understanding of how students' cognitive beliefs translate into sustained academic engagement, offering valuable insights for researchers.

The findings of this study have important significance for educational practitioners, including lecturers, university administrators, and policymakers. Interventions should not only cultivate a growth mindset but also strengthen students' future time perspective and grit. Policymakers can incorporate these insights into curriculum development and student support programs to enhance overall academic persistence and success.

In summary, this study provides a novel theoretical model, expands the body of knowledge on academic motivation, and offers actionable insights for educational practitioners, ultimately contributing to a more effective and sustainable approach to fostering student engagement.

## **1.7 Scope and Limitation**

Considering the limited time and resources, as well as the influence of some objective factors, the sampling scope of this study targeted undergraduate students at

five universities in Yunnan Province, so the data obtained are regionally limited and the results produced are regionally representative. The results obtained from the analysis may not be suitable for generalization to other regions with different levels of economic development, since the educational level and the level of student development vary among universities in each region.

In addition to limitations in the scope of sampling, there are also limitations in the content of the study. As cognitive subjects, there are many psychological aspects to be considered in the mechanisms of change and influence of the complex psychological processes of learning within students. This study designed a model of the role of growth mindset on academic engagement based on a literature review, which involved influencing factors such as future time perspective and grit. This study does not control for any external variables that may have an impact on the proposed hypotheses, such as gender, socioeconomic status, and parenting style.

Limitations on self-reported risk. This study utilized the questionnaire method in quantitative research and the data were derived from undergraduate students' self-reports, which may lead to social desirability bias. This refers to the tendency of respondents to provide answers that meet social expectations and show more positive traits when answering questionnaires in order to gain recognition from others or fit in with the group, rather than expressing their true intentions (Chung & Monroe, 2003). This may threaten the validity of the instrument. In order to minimize such effects, this study selected scales with reverse scored items and emphasized anonymity in the guidelines of the questionnaire to encourage respondents to provide truthful answers. In addition, a strict screening procedure was used to exclude unreasonable data (Nederhof, 1985).

## **1.8 Conceptual and Operational Definition**

The terms used in this study are defined below.

### **1.8.1 Growth Mindset**

Dweck et al. (1995) proposed an entity theory and an incremental theory in their study of implicit beliefs about intellectual stability. In a further study, Dweck (2006) replaced the term "implicit theories" with "mindset" and proposed two different mindsets: the growth mindset and the fixed mindset. Individuals with a fixed mindset believe that abilities are innate and unchangeable, while the growth mindset believes that intelligence or ability is not static, but can be molded and changed through training. Liu (2022b) define growth mindset as a way of thinking in which individuals are able to learn and grow through failures. Zhao et al. (2022) argue that growth mindset is an ability to grow perspective in which individuals believe that human intelligence can be grown and molded.

Synthesizing the above scholars' discussion of the concept of growth mindset, this study argues that growth mindset refers to an individual's belief that one's intelligence, potential, talent, and other qualities can be grown through acquired practice, perseverance, effort, and effective learning strategies.

Zhao et al. (2022) translated the Chinese version of Growth Mindset Scale developed by Dweck (1999).

1. Growth mindset: e.g. "No matter who you are, you can significantly change your intelligence level" (Item 4).

2. Fixed mindset: e.g. "Your intelligence is something about you that you can't change very much" (Item 1).

### **1.8.2 Future Time Perspective**

Huang (2004) viewed future time perspective as a personality trait in which an individual's perceptions, experiences, and tendencies to act on future time have a high degree of stability. Rabinovich et al. (2010) suggest that future time perspectives are shaped by an individual's unique life experiences, and that individuals gradually build up emotions and conceptions of the future based on past events and feelings. Sun et al. (2020) argued that the future time perspective involves a subjective life course consisting of life domains that an individual considers important, on which a vision of the future is formed. Henry et al. (2017) describe the future time perspective as an individual's perception of time in the remainder of their life, which influences temporal planning for future events and prioritization of choices and goals to pursue. The Future Time Perspective focuses on the future view of time, characterized by planning and achieving future goals, and reflects an individual's overall future attention (Cheng & Nguyen, 2023).

All of the above definitions of future time perspective express the individual's prospects for the future and the pursuit of goals. The definition proposed in this study is that future time perspective reflects the future orientation held by individuals in their beliefs and attitudes toward time. It involves the cognitive, affective, and behavioral dispositions of an individual's conception of self-development.

In the scale developed by Song (2004), the future time perspective was categorized into five dimensions: future image, future efficacy, future purpose consciousness, far goal orientation, and behavioral commitment.

1. Future image reflects the individual's imagery of near and distant future events or tasks, showing a sense of future fulfillment and initiative. For example, "Looking ahead, I have a lot of things to do" (Item 5).

2. Future efficacy reflects the individual's confidence in the future, believing that he or she has the ability to create a better future. For example, "I feel confident about my future"(Item 16).

3. Future purpose consciousness reflects the clarity of an individual's understanding of future development and whether the individual is concerned about future development. For example, "I often feel that life has no purpose" (Item 18).

4. Far-goal orientation reflects the individual's planning and concern for long-term life goals. For example, "I often remind myself not to forget the most important goal in the future" (Item 9).

5. Behavioral commitment reflects an individual's willingness to set goals and take practical action. For example, "Once a goal has been set, I take specific measures to achieve it" (Item 2).

### **1.8.3 Grit**

The original meaning of the word "Grit" refers to hard-wearing particles in a pile of sand. Grit has been defined as persistent effort and sustained enthusiasm demonstrated in the pursuit of long-term goals, and primarily encompasses the attributes of courage, responsibility, endurance, optimism, resilience, and excellence, which are cross-sectional and adaptive resources (Duckworth et al., 2007). Grit, as a non-cognitive mental quality, is closely related to intrinsic motivation, which benefits people in the pursuit of long-term goals (Christopoulou et al., 2018). Duckworth

(2016) believes that grit is a malleable, teachable personality trait and is an important psychological resource. The grit consists of two key components, perseverance of effort refers to an individual's persistence in making continuous attempts and efforts to achieve a goal even when encountering adversity, and consistency of interests refers to the consistency and sustainability of an individual's enthusiasm to achieve a goal over time (Xue, 2021).

Based on the above review of definitions, this study recognizes that perseverance of effort and consistency of interests comprise the important connotations of grit, which focuses on long-term mental strength rather than instantly achievable goals. It requires a great deal of patience and determination to make an effort to act, and it involves sustained enthusiasm in the process.

According to Duckworth et al. (2007), grit is composed of two different dimensions: perseverance of effort and consistency of interests, so the related scale developed accordingly also uses perseverance of effort and consistency of interests as important factors in evaluating the quality of grit in an individual, and Xie et al. (2017) revised the Chinese version of the Perseverance Scale on this basis.

1. Perseverance of effort refers to an individual's ability to maintain motivation and sustain effort toward long-term goals despite challenges, setbacks, or failures. e. g., "I finish whatever I begin" (Item 9).

2. Consistency of interests refers to an individual's sustained commitment to a specific goal or domain over an extended period, rather than frequently shifting interests or abandoning previous goals. e. g., "I have difficulty maintaining my focus on projects that take more than a few months to complete" (Item 8).

#### **1.8.4 Academic Engagement**

Myint and Khaing (2020) argues that the main observation of engagement is whether students are actively and positively engaged in the various activities of learning. Bond et al. (2020) identified academic engagement as the time, effort, and practical actions that students put into their own academics, which are reflected in their cognitive, affective, and behavioral aspects. Xiong et al. (2021) identified school engagement as the sense of belonging that students develop to the school and their identification with the school's goals. Engagement has also been defined as the degree of behavioral involvement, the quality of affective experience, and the level of cognitive strategies used by students in the execution of learning activities (Datu & Buenconsejo, 2021).

In this study, academic engagement is defined as students' active participation in all learning activities, in-depth thinking, and energetic response to challenges and frustrations, accompanied by positive emotional experiences. Therefore academic engagement consists of three aspects including behavioral engagement, cognitive engagement, and emotional engagement. Behavioral engagement involves the behavioral state exhibited by the learning process. Cognitive engagement refers to the utilization of students' mental resources and the application of cognitive strategies in the learning process. Emotional engagement refers to the various types of affective responses that students have when faced with academic content and the learning environment.

It was measured using the "Chinese College Students' Academic Engagement Questionnaire" developed by Wang (2015), which includes three dimensions, behavioral engagement, cognitive engagement, and emotional engagement.