

The Impact of Negative Academic Emotions in High School Students on Future Time Perspective (The Mediating Role of Academic Self-Efficacy)

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ABSTRACT

Against the backdrop of the new college entrance examination policy, high school students face the challenge of choosing subjects, which requires them to possess a heightened level of career planning skills, along with the experience and comprehension of their future selves, also known as their future time perspective. This study is specifically conducted with 500 students as subjects, employing the "Adolescent Academic Emotion Questionnaire", the "Academic Self-Efficacy Questionnaire", and the "Adolescent Future Time Perspective Scale" to carry out measurements. Effective data is collected for analysis to examine whether academic self-efficacy can serve a mediating role.

KEYWORDS

High School Students; Future Time Perspective; Academic Self-Efficacy; Negative Academic Emotions

1 Introduction

In light of the new college entrance examination policy, high school students are confronted with the task of selecting subjects, necessitating an enhanced level of career planning proficiency, coupled with insights and understanding of their future selves, specifically their future time perspective. This policy shift underscores the importance of career planning abilities among students, as they navigate the complex decision-making process regarding their future academic and professional paths. Furthermore, it necessitates a heightened awareness and understanding of their future selves, encapsulated by the concept of future time perspective. Future time perspective refers to an individual's cognitive representation of their future, influencing their current behaviors, decisions, and aspirations.

Empirical investigations demonstrate bidirectional relationships between affective states and cognitive-motivational constructs in educational contexts. Research by Jin Ming and colleagues (2022) identified mindfulness-derived positive affectivity as a robust predictor of enhanced future time perspective (FTP), implying that adverse academic emotions might conversely undermine this forward-looking cognition. Parallel studies underscore the interdependence of academic emotions and self-efficacy: Wang Yueti's (2022) work revealed significant associations between scholastic affect and self-perceived competence, while cross-cultural findings (Membiela et al.) and recent longitudinal analyses (Yang Peijin et al., 2024) corroborate that positive academic emotions amplify self-efficacy, whereas negative emotions substantially diminish it. Specifically, Yang's team quantified this dichotomy, showing a direct proportionality between positive affect intensity and self-efficacy strength in adolescents, with inverse patterns observed for maladaptive emotions. Collectively, this evidence posits that persistent negative academic emotions likely impair both self-efficacy and FTP through interrelated psychological mechanisms.

The research conducted by Lu Houchao and colleagues in 2021 indicates a strong connection between self-esteem, which represents one's current subjective self-image, and future time perspective. Given that self-efficacy and individual emotional experiences are also crucial indicators reflecting one's current self-image, it is conceivable that self-efficacy might positively influence future time perspective. Future time perspective holds a key position in shaping high school students' current learning motivation, strategies, future career decisions, and overall life planning. Based on this understanding, the current study puts forward the following hypotheses: Firstly, experiencing negative academic emotions is inclined to predict a less optimistic future time perspective. Secondly, self-efficacy serves as a mediator in the connection between negative academic emotions and the predictions made about future time perspective.

2 Methodology

2.1 Research Objectives

This research adopts a survey-based methodology to examine the present situation of adverse learning emotions, educational confidence levels, and temporal orientation regarding future goals in secondary school students within the context of the updated college admission framework. The investigation further assesses potential correlations between detrimental academic sentiments and prospective temporal perception through intermediary pathway analysis, specifically evaluating the potential mediating function of learners' belief in their academic capabilities within this

dynamic.

2.2 Research Methods

The research/study in this paper employs Wenjuanxing Survey along with SPSS 27.0 Analysis. It employs a web-based questionnaire methodology using the Questionnaire Star platform (Wenjuanxing), a widely utilized online survey tool in China, to collect cross-sectional data. To ensure broad participation, the survey link was systematically disseminated through multiple digital channels, including WeChat (a ubiquitous messaging and social media application) and QQ (a popular instant communication platform with group-based functionalities). These platforms were strategically selected due to their extensive adoption among Chinese high school students and educators, facilitating efficient recruitment of participants across diverse geographical regions. Prior to distribution, the questionnaire underwent rigorous validation to ensure clarity and reliability. Participants were given informed consent documents outlining the study's goals, measures to ensure anonymity, and the optional nature of their participation.

2.3 Research Tools

2.3.1 Adolescent Future Time Perspective Scale

The scale employed in the research is the "Adolescent Future Time Perspective Scale" developed by Lü Houchao (2014). This scale encompasses a total of 28 items, spread across six different dimensions, 5 items for the Positive Future dimension, 7 items for the Negative Future dimension, 4 items for the Future Confusion dimension, 3 items for the Future Persistence dimension, 4 items for the Future Planning dimension, and 5 items for the Future Clarity dimension. The Likert 5-point scoring method is used, with the Negative Future and Future Confusion dimensions being reverse-scored. The Cronbach's alpha coefficient for this study is 0.88, indicating good internal consistency.

2.3.2 Academic Self-Efficacy Survey

This study employs the Academic Self-Efficacy Scale, thoughtfully crafted by Liang Yusong in 2000. This scale consists of 22 items, carefully divided into two distinct categories: learning ability and learning behavior. Responses are measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A higher overall score on this scale indicates a higher level of academic self-efficacy among participants. Within the scope of this research, the internal consistency reliability of the scale was rigorously evaluated and resulted in a score of 0.885, attesting to its strong reliability and validity for the purposes of this study.

2.3.3 Adolescent Academic Emotions Questionnaire

The questionnaire formulated by Yu Guoliang and Dong Yan in 2007 encompasses four key areas: positive high-arousal, positive low-arousal, negative high-arousal, and negative low-arousal. For the purposes of this study, only two of these areas were selected: positive high-arousal and negative high-arousal. Positive high-arousal comprises three secondary emotional aspects—happiness, pride, and hope—consisting of 16 items in total, whereas negative high-arousal includes anxiety, anger, and shame, totaling 17 items. Participants rate each item using a five-point scale, ranging from "completely disagree" (1) to "completely agree" (5).

The overall score for each chosen area is obtained by summing the item scores, with higher scores indicative of more intense positive or negative academic emotions. In this research, the internal consistency reliability coefficients were found to be 0.79 for positive high-arousal and 0.83 for negative high-arousal.

2.4 Research Process

Before the implementation of the measures, consent was explicitly obtained from all participants to ensure their voluntary participation and understanding of the study's purpose and procedures. This step was crucial in maintaining ethical standards and respecting the autonomy of the middle school students involved. Following the completion of the informed consent form, which detailed the nature of the study, potential risks, and confidentiality measures, the assessment commenced.

The questionnaire, which was designed specifically for this study, was comprehensive and covered various aspects pertinent to the research objectives. It delved into the realm of negative academic emotions, capturing the students' experiences and feelings related to their academic endeavors. Additionally, the questionnaire explored academic self-confidence, examining the students' beliefs about their abilities to succeed academically and their confidence in overcoming academic challenges. Furthermore, the questionnaire incorporated questions pertaining to future time

perspective, shedding light on how the students perceived and valued their future and how this influenced their current academic behaviors and attitudes. By collecting information on these various factors, the research intended to achieve a comprehensive insight into how negative academic emotions, academic self-confidence, and future time perspective interact among middle school students.

3 Data Analysis

After successfully collecting the data from the questionnaires, the initial step in the data processing phase involved meticulously filtering out any invalid questionnaires.

This crucial process ensured the accuracy and reliability of the results by excluding questionnaires that were filled out haphazardly, potentially due to lack of attention or misunderstanding of the questions. Examples of such invalid questionnaires included those with consecutive identical responses across the entire page, indicating a lack of genuine engagement from the participants.

Following the rigorous screening process, the validated data was then meticulously entered into SPSS 27.0, a sophisticated statistical software widely recognized for its robust analytical capabilities. This software served as the cornerstone for conducting a thorough statistical analysis of the collected data. Correlation analysis was then conducted to examine the strength and direction of the relationships between negative academic emotions, academic self-efficacy, and future time perspective.

This method allowed researchers to ascertain whether there were any statistically significant associations between these variables.

Regression analysis was subsequently performed to further investigate the predictive power of certain variables on others. Specifically, it helped determine whether academic self-efficacy and future time perspective could predict levels of negative academic emotions, thereby shedding light on potential causal mechanisms. Finally, path analysis was utilized to delineate the intricate relationships among the variables in greater detail.

This technique facilitated the understanding of how changes in one variable might influence another, and ultimately, how these interconnected relationships contributed to the overall picture of middle school students' academic experiences. By leveraging these diverse statistical methods, the study aimed to derive meaningful conclusions that could inform future educational practices and interventions designed to enhance the academic well-being of middle school students.

3.1 Descriptive Analysis

Dimension	Mean Value	Dimension	Mean Value
Positive Future	3.339	Learning Ability	3.342
Negative Future	2.724	Learning Behavior	3.369
Future Confusion	2.672	Positive Arousal	3.374
Future Persistence	3.428	Negative Arousal	3.309
Future Planning	3.396	Positive High-arousal	2.678
Future Clarity	3.29	Negative High-arousal	2.641

3.2 Reliability and Validity Analysis

3.2.1 Reliability Analysis

Reliability analysis is a crucial process that evaluates whether the scales used within a questionnaire are capable of producing dependable and trustworthy results. In essence, it serves as a means to verify the honesty and accuracy of the survey responses obtained from participants.

This involves a thorough examination of the consistency of the outcomes generated when the same questionnaire is administered multiple times to the same group of participants over a specified period. The goal of this analysis is to ensure that the responses remain stable and consistent across different administrations, thereby reflecting the true underlying constructs being measured.

One of the most commonly used methods for assessing reliability is Cronbach's alpha. This statistical measure provides an estimate of the internal consistency of a set of items, indicating how well the items measure the same underlying construct.

A Cronbach's alpha value that exceeds 0.7 is generally regarded as satisfactory, indicating that the items within the scale are sufficiently correlated with one another and that the scale is reliable for use in research. However, it is important to note that the acceptable level of Cronbach's alpha may vary depending on the specific context and requirements of the research being conducted.

3.2.2 Validity Analysis

Validity is verified using the KMO and Bartlett's test.

KMO Value		0.972
Bartlett's Test of Sphericity	Approximate Chi-Square	50285.528
	df	7381
	p value	0.000

3.2.3 Exploratory Factor Analysis

In this study, the data underwent varimax rotation to establish the relationship between factors and research items. Factor analysis identified a total of 12 factors, each possessing an eigenvalue exceeding 1. After rotation, these 12 factors explained the variance at rates of 13.944%, 9.472%, 9.067%, 7.905%, 5.920%, 5.916%, 3.865%, 2.773%, 2.633%, 2.242%, 2.192%, and 1.674% respectively.

3.2.4 Correlation analysis

Correlation analysis was utilized to examine the relationships between the Adolescent Future Time Perspective Scale and both the Academic Self-Efficacy Scale as well as the Adolescent Academic Emotions Scale, totaling two sets of correlations.

	Academic Self-Efficacy Scale	Adolescent Academic Emotions Scale	Adolescent Future Time Perspective Scale
Academic Self-Efficacy Scale	1		
Adolescent Academic Emotions Scale	-0.297**	1	
Adolescent Future Time Perspective Scale	0.247**	-0.191**	1

* p<0.05 ** p<0.01

The analysis unveiled that there was a significant positive correlation between the Adolescent Future Time Perspective Scale and the Academic Self-Efficacy Scale, with a correlation coefficient of 0.247 at the 0.01 level of significance. Conversely, a significant negative correlation was observed between the Adolescent Future Time Perspective Scale and the Adolescent Academic Emotions Scale, with a correlation coefficient of -0.191 at the 0.01 level of significance.

3.2.5 Mediating Regression Analysis

The Academic Self-Efficacy Scale acting as the mediator, and the Adolescent Future Time Perspective Scale being the outcome (dependent variable). The analysis of mediating regression analysis involves three models, as follows.

Model 1: Adolescent Future Time Perspective Scale = 2.722 + 0.112 * Academic Self-Efficacy Scale.

Model 2: Adolescent Academic Emotions Scale = 3.426 - 0.144 * Academic Self-Efficacy Scale.

Model 3: Adolescent Future Time Perspective Scale = 3.137 + 0.095 * Academic Self-Efficacy Scale - 0.121 * Adolescent Academic Emotions Scale.

The mediating role was tested, and the test results are summarized in the following table.

Item	cTotal effect	a	b	a*bIntermediary effect value	a*b(Boot SE)	a*b(z value)	a*b(p value)	a*b(95% BootCI)	c'Direct effect	Test Conclusion
Academic Self-Efficacy Scale => Adolescent Academic Emotions Scale => Adolescent Future Time Perspective Scale	0.112**	-0.144**	-0.121**	0.017	0.015	1.179	0.239	0.009 ~ 0.070	0.095**	Partial mediation

Notes:
 * p<0.05 ** p<0.01
 Bootstrap types = Percentile bootstrap method

From the above table, it can be seen that the mediating effect of the path "Academic Self-Efficacy Scale => Adolescent Academic Emotions Scale => Adolescent Future Time Perspective Scale" is significant. Based on the analysis of Model 3, the table reveals a formula: Adolescent Future Time Perspective Scale = 3.137 + 0.095 * Academic Self-Efficacy Scale - 0.121 * Adolescent Academic Emotions Scale. The R-squared value of 0.076 suggests that these two scales account for 7.6% of the

variance in the Adolescent Future Time Perspective Scale. An F-test conducted on the model was significant ($F=20.519$, $p<0.05$), indicating that at least one variable from either scale impacts the Adolescent Future Time Perspective Scale. Furthermore, multicollinearity checks showed all VIF values below 5, confirming no collinearity issues. The D-W value close to 2 indicates no autocorrelation, and the sample data are uncorrelated.

3.3 Conclusion of data analysis

The Academic Self-Efficacy Scale has a notable and statistically significant positive effect on the Future Time Perspective Scale for adolescents. This positive relationship is evidenced by its regression coefficient of 0.095, which indicates that as academic self-efficacy increases, so too does the adolescents' future time perspective. The strength of this relationship is further supported by the t-value of 4.624, which exceeds the critical t-value for statistical significance, and the p-value of less than 0.01, which confirms the significance at the 99% confidence level. Conversely, the Adolescent Academic Emotions Scale exhibits a significant and statistically significant negative influence on the Adolescent Future Time Perspective Scale. The regression coefficient of -0.121 indicates that as negative academic emotions increase, the adolescents' future time perspective decreases. The negative relationship is supported by the t-value of -2.859, which is below the critical t-value for statistical significance in the opposite direction, and the p-value of less than 0.01, which confirms the significance at the 99% confidence level.

4 Conclusion

Considering the crucial significance of future time perspective in motivating learning, strategy adoption, career decisions, and life planning among high school students, this study advances two hypotheses: Firstly, negative academic emotions are hypothesized to predict a lesser future time perspective in a negative manner. Secondly, it is proposed that self-efficacy operates as a mediator in the relationship between negative academic emotions and future time perspective. Data analysis results support these hypotheses, with a significant positive regression coefficient for the Academic Self-Efficacy Scale (0.095, $t=4.624$, $p=0.000<0.01$) and a significant negative regression coefficient for the Adolescent Academic Emotions Scale (-0.121, $t=-2.859$, $p=0.004<0.01$). These findings suggest that self-efficacy positively influences future time perspective, while negative academic emotions negatively impact it, reinforcing the importance of managing academic emotions and enhancing self-efficacy among high school students.

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