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Learning Attitude Mediates the Relationship Between Parental Educational Expectations and Academic Performance of Junior High Students: Evidence from China

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Abstract

With the rapid development of China, parents are placing higher and higher expectations on their children's education. Drawing upon baseline data from the China Education Panel Survey (CEPS2013), this study delves into the mechanisms through which the learning attitude of junior high school students affects the association between parental educational expectations and academic performance. The results of the present study show that students'

learning attitude is a significant factor that impacts the academic performance of junior high school students and plays a substantial mediating role in the relationship between parental educational expectations and academic performance. Our analyses reveal that parental educational expectations have a greater impact on test scores compared to cognitive ability. Additionally, the mediating effect of learning attitude on the relationship between parental educational expectations and test scores is considerably stronger than the relationship between parental educational expectations and cognitive ability. These results contribute to a better understanding of the mechanism by which parental educational expectations affect children's academic performance, which has implications for educational policy and practice in China.

Keywords: parental educational expectations, learning attitude, academic performance, mediation effect

1. Introduction

The role of education in social stratification has been a longstanding topic of inquiry. In contemporary society, education is an important means for individuals to achieve social mobility and cross class boundaries. As a result, parents frequently express a desire for their children to obtain high-quality education as a foundation for future success in terms of status, position, and income. In this way, academic performance at different stages of learning becomes a key aspect of educational improvement. Previous research has highlighted the significance of family-related factors as determinants of academic performance, such as family socioeconomic status (Caro et al., 2009; Liu et al., 2020; Selvitopu & Kaya, 2023; White, 1982; Yeung et al., 2022), parents' beliefs and behaviors (Davis-Kean, 2005; Elliott & Bachman, 2018; Halle et al., 1997; Hayes et al., 2015; Šimunović & Babarović, 2020), parental involvement (Benner et al., 2016; Castro et al., 2015; Dumont et al., 2012; Kim, 2020; Li et al., 2019; Peng et al., 2023), and parental educational expectations (Jeynes, 2024; Long & Pang, 2016; Neuenschwander et al., 2007; Pinquart & Ebeling, 2020; Seginer, 1983; Zhan, 2006).

Generally speaking, educational expectations represent the value judgments and expectations about education that individuals have about their educational attainment in either a school or university setting. The construct comprises two key dimensions: short-term expectations, which encompass the specific scores at the end of a marking period or on an upcoming test (Neuenschwander et al., 2007; Seginer, 1983), and long-term expectations, which entail expected educational achievements that are envisioned for a more extended period, such as completing a specific number of years of schooling or achieving the highest level of education (Gill & Reynolds, 1999; Yamamoto & Holloway, 2010).

The family is the primary social context where children grow and develop, and parents serve as "significant others" who influence their socialization (Eccles & Wigfield, 2002). Therefore, parental educational expectations are critical to children's development. A growing body of research has shown that high parental educational expectations are positively associated with children's academic performance (Castro et al., 2015; Jeynes, 2007, 2024; Pinquart & Ebeling, 2020; Yamamoto & Holloway, 2010), and can enhance their cognitive development (Ji et al., 1993; Leung & Shek, 2019; Li et al., 2019). Moreover, even for low-income families, high parental educational expectations for their children are an important way to academic success (De Civita et al., 2004; Jeynes, 2024).

However, the high educational expectations of Chinese parents are even more pronounced. Evidence from previous studies shows that Asian parents have higher educational expectations for their children (Goyette & Xie, 1999; Li & Xie, 2020; Stevenson & Stigler, 1994; Zhu & Chang, 2019). Normally, the Chinese have used the expression "Shooting for the Stars" since ancient times to describe parents' high expectations for their children's education (Li & Hu, 2021). Pursuing higher education is becoming more and more popular due to socioeconomic development and demographic transition. As a result, it is the most common expectation of Chinese parents that their children will achieve higher academic results. Meanwhile, another study conducted among immigrant Chinese parents revealed that parents'

attitudes and behaviors are the most important factors that influence children's outcomes. This explains why Asian parents' authoritarian or controlling parenting styles are associated with better school success for their children, as Asian students understand this behavior as originating from their parent's care and love (Chao, 1994).

Therefore, how do parental educational expectations affect children's academic performance? Some important mediator variables can be found from the existing research results, including children's academic expectations, academic engagement, academic self-concept, and parents' achievement-supportive behaviors (Gill & Reynolds, 1999; Li & Hu, 2021; Li et al., 2019; Loughlin-Presnal & Bierman, 2017; Seginer, 1983). Based on the previous research literature, we found that less attention had been paid to the potential intermediary role of children's learning attitude in the relationship between parental educational expectations and academic performance. Some studies have proven that children's learning attitudes and habits are important factors affecting academic performance (Li & Qiu, 2018; Otani, 2020). As an important psychological support, parental educational expectations can correct children's learning attitude, improve learning motivation, and stimulate learning behavior. Considering these research limitations, the present study aims to investigate the mechanism underlying the relationship between parental educational expectations and academic performance among junior high school students in China. More specifically, it will focus on the following three questions: a) the effect of parental educational expectations on academic performance; b) the effect of students' learning attitude on academic performance; and c) whether students' learning attitude plays a mediating role between parental educational expectations and academic performance.

2. Literature Review and Research Hypotheses

2.1 Parental Educational Expectations and Academic Performance

In 1966, sociologist Coleman et al. (1966) presented the "Equality of Education Opportunity" report, which is famously known as the "Coleman Report", to the US Congress. This report shifted the focus from school-based to family-based factors affecting students' academic performance, highlighting family background as the primary factor influencing academic achievement. Since then, numerous studies have explored the specific mechanisms through which family background affects academic achievement, including educational resources and parental involvement (Becker, 2009; Coleman, 1988; Dumont et al., 2012; Poon, 2020; Teachman, 1987; Zhang et al., 2020), parental educational expectations (Davis-Kean, 2005; Jeynes, 2024; Li & Hu, 2021), and students' expectations, self-efficacy, and engagement (Bourdieu & Passeron, 1990; Ren et al., 2021; Tomaszewski et al., 2020; Weiser & Riggio, 2010). For example, cultural capital theory suggests that parents who are culturally capital-rich are usually more aware of the rules of schooling and invest more cultural resources, focusing on fostering their children's educational aspirations and interest in learning to help their children achieve academic excellence (Bourdieu & Passeron, 1990).

Parental educational expectations, in particular, have been identified as a crucial factor within the family context (Christenson et al., 1992; Fan & Chen, 2001). In prior research conducted in both the West and East, parental educational expectations were a significant predictor of

high academic achievement among children (Jacobs & Harvey, 2005; Jeynes, 2024; Li et al., 2019; Loughlin-Presnal & Bierman, 2017; Pinquart & Ebeling, 2020; Seginer, 1983). For example, a meta-analysis by Kim (2020) of parental involvement and achievement in East Asian countries showed that academic socialization, i.e., educational expectations and aspirations, as well as parental attitudes toward education, were the strongest predictors of achievement, indicating that beliefs and attitudes were the most powerful factors regardless of national background. To a certain extent, parenting expectations can play a key role in promoting children's development by fostering children's beliefs about their abilities. Therefore, this study proposes the following research hypotheses:

Hypothesis 1: Parental educational expectations are significantly and positively associated with the academic performance of junior high school students.

Hypothesis 1a: Parental educational expectations are significantly and positively associated with the test scores of junior high school students.

Hypothesis 1b: Parental educational expectations are significantly and positively associated with the cognitive ability of junior high school students.

2.2 Learning Attitude and Academic Performance

Learning attitude refers to the psychological dispositions of individuals towards cognitive, emotional, and behavioral tendencies during the learning process. The development of a child's attitude to learning is a process of internalizing values through the interaction of environmental factors and individual psychological needs. A positive learning attitude is the key to effective learning and adapting to the environment. In other words, learning attitude makes learners have a selective effect on perception and thus has a screening effect on learning materials. Evidence from China suggests that there are two pathways through which families influence their children's academic achievement: the first one is competing for high-quality educational opportunities, and the second is through parental behavior and educational support aimed at developing their children's study habits (Li & Qiu, 2018). This finding highlights the importance of adopting a positive learning attitude and developing effective study habits. It can shape learners' expectations and influence their perception and learning outcomes. Moreover, a learning attitude runs through the whole learning process and has a positive or negative impact on learning activities and their results. Positive educational expectations from parents can facilitate the internalization of positive teaching and behavioral traits in children, resulting in the development of a positive learning attitude, self-awareness, and perseverance (Assem et al., 2023; Capuno et al., 2019; Mensah et al., 2023; Schunk & DiBenedetto, 2020). Based on this, the following research hypotheses are proposed:

Hypothesis 2: The learning attitude of junior high school students is significantly and positively associated with academic performance.

Hypothesis 2a: The learning attitude of junior high school students is significantly and positively associated with test scores.

Hypothesis 2b: The learning attitude of junior high school students is significantly and

positively associated with cognitive ability.

2.3 The Mechanism Between Parental Educational Expectations and Academic Performance

As a crucial extrinsic motivator, parental educational expectations necessitate their manifestation in students' academic pursuits for effective influence. According to Wilder (2014), there is a positive association between parental involvement and academic achievement regardless of how parental involvement is defined. However, when parental involvement is defined as parental expectations for their children's academic performance, the relationship is particularly strong, surpassing the impact of parental involvement defined as assistance with homework. It indicates that parental psychological support for their children's academic pursuits may hold greater significance than tangible assistance. Empirical research by notable scholars revealed that the impact of parental educational expectations on students' academic performance is mainly achieved via two channels. The first channel involves increasing educational investment. That is, high educational expectations motivate parents to increase educational investment by allocating more resources and dedicating more time and energy to parenting. The second channel is related to the intergenerational transmission of values and preferences. That is, parents' expectations and concepts affect their children's values and behavioral attitudes through family socialization (Goodman & Gregg, 2010; Otani, 2020). Subsequently, children also adopt their parents' high educational expectations and develop a motivating psychological energy that values and drives their academic pursuits.

Parents' expectations of their children's education reflect their attitudes to learning, which in turn have a significant impact on children's motivation and attitudes to learning. Adolescents in the pubertal stage typically lack the maturity required to comprehend various facets of life. This developmental phase represents a pivotal period for individual cognitive, emotional, and social growth, wherein a salient feature is the heightened expectation of self-roles and prospects (Erikson, 1968). At this stage, individuals will position the "self that wants to be" and the "self that is afraid of being". A positive "self that wants to be" helps students establish expectation-oriented attitudes and behaviors, such as studying harder and spending more time doing homework (Markus & Nurius, 1986). Therefore, setting the right learning goals and attitudes during secondary school has a positive impact on academic success. The social environment surrounding a child, including family, school, and society, can greatly influence a child's learning status and academic performance. Previous studies showed that learning attitude plays a mediating role in the influence of family-objectified cultural capital on academic achievement (Yu et al., 2022), while parental educational expectations are regarded as a manifestation of parental cultural capital (Huang & Liang, 2016). Informed by the literature above, we develop and test the following research hypotheses:

Hypothesis 3: The learning attitude of junior high school students mediates the relationship between parental educational expectations and academic performance.

Hypothesis 3a: The learning attitude of junior high school students mediates the relationship between parental educational expectations and test scores.

Hypothesis 3b: The learning attitude of junior high school students mediates the relationship between parental educational expectations and cognitive ability.

3. Methodology

3.1 Data

The data for this study comes from the baseline data of the 2013–2014 school year of the China Education Panel Survey (CEPS). This project is a comprehensive longitudinal survey conducted by National Survey Research Center at Renmin University of China (NSRC), providing a representative picture of the educational context in China. The CEPS project was launched in response to the rapid expansion of China's education system and the significant changes in the educational environment that accompanied this expansion. It is worth noting that before the launch of the CEPS project, most representative national survey projects in China focused on household surveys. A large school-based survey had never been done, and CEPS is a pioneer project. The primary objective of the CEPS project is to document the educational process and transformation of different school stages and explain the connection between individual educational output and the multidimensional context of family, school, community, and social structure. Furthermore, it aims to investigate the impact of family, school, community, and macro social structure on individual educational outcomes and to explore the impact of educational outcomes on lifelong individual development.

CEPS selected two cohorts—grade 7 and grade 9—as the survey starting point. To ensure a representative sample, the survey employed a multi-stage probability-proportional-to-size (PPS) sampling method, which utilized the average education level of the population and the proportion of the mobile population as stratification variables. Specifically, it included four stages. In the first stage, 28 counties (districts) were selected from the administrative units at the county (district) level in China. In the second stage, four schools were selected within each sampled county (district) based on their geographical location. Specifically, the selected schools were those with seventh and ninth grade students. In the third stage, four classes were selected in each sampled school, including two seventh-grade classes and two ninth-grade classes. In the fourth and final stage, all students, parents, head teachers, teachers of the main subjects (Chinese, Math, English), and school leaders in the sampled classes constituted the final survey sample.

The survey employed questionnaires as the primary data collection method, targeting all the surveyed students, their parents or guardians, head teachers, main course teachers, and school leaders. The implementation of this survey is based on schools, and a total of 112 schools and 438 classes were randomly selected from the chosen county-level units to participate in the survey. The sampling strategy ensured that all students within the selected classes were included in the study, resulting in a baseline survey sample of 19,487 students.

In our empirical analysis, data processing involved two steps. First, we merged the questionnaires of students, families, and schools to obtain a comprehensive dataset. Second, we excluded cases with missing values or responses of "unknown" for variables such as students' gender, parents' education status, school ranking, and other relevant variables in the

sample. The final analytic sample was comprised of 17,155 participants.

3.2 Measurements

3.2.1 Dependent Variables

The dependent variable is academic performance. Academic performance is not solely manifested in test grades. Scholars in the fields of education and psychology have long highlighted the presence of cognitive and even non-cognitive abilities that are inherent in academic performance (Fonteyne et al., 2017; Veas et al., 2015). Some researchers have even argued that cognitive abilities, such as language, memory thinking, reasoning, and others, are more indicative of students' academic performance (Zhan & Chen, 2017). To provide a comprehensive evaluation of students' academic performance, this study incorporates two distinct indicators, namely test scores and cognitive ability. This method ensures a more detailed and accurate measurement of academic performance, reflecting the multifaceted nature of this construct.

The first dependent variable is test scores, which were derived as the sum of standardized scores in Chinese, Math, and English subjects obtained in the mid-term exam of 2013. The second dependent variable is cognitive ability, which was assessed by standardized scores on a cognitive test questionnaire administered to children.

3.2.2 Independent Variable

The independent variable is parental educational expectations, which was operationalized using question A18 from the parent questionnaire of the CEPS. To gauge parental educational expectations, respondents were asked, "What is the highest level of education do you expect this child to receive?"

3.2.3 Mediating Variable

The mediating variable examined in this study is the student's learning attitude. CEPS developed question C09 for parents to measure this construct. The question is titled "What do you think of the general attitude of this child towards schoolwork?"

3.2.4 Control Variables

In our study, we took into account the potential influence of various factors on the outcomes under investigation by controlling for individual student characteristics, family background characteristics, and school characteristics. Especially, individual student characteristics included grade level, gender, household registration type, ethnicity, only child status, and mobility status. Furthermore, family background characteristics encompassed family economic status, the father's education level, and the mother's education level. Lastly, school characteristics were represented by school ranking, school type, and school location. The measurement and descriptive results of variables are shown in Table 1.

Table 1. Measurements of variables and descriptive results (N = 17,155)

Variables	Subsample	Mean	SD	Percent(%)
Dependent variables				
Total score, TS	The sum of standardized scores in Chinese, Math and English on the 2013 midterm	211.05	25.47	
Cognitive ability, CA	Standardized scores on cognitive tests	0.03	0.85	
Independent variable				
Parental educational expectations, PEE	1 = Drop out now; 2 = Graduate from junior high school; 3 = Go to technical secondary school or technical school; 4 = Go to vocational high school; 5 = Go to senior high school; 6 = Graduate from junior college; 7 = Get a bachelor degree; 8 = Get a Master degree; 9 = Get a Doctor degree	7.03	1.54	
Mediating variable				
Learning attitude, LA	1= Not serious at all, 2 = Somewhat not serious, 3 = Moderate, 4 = Somewhat serious, 5 = Very serious	3.34	0.96	
Control variables				
Grade	0 = Grade seven			53.28
	1 = Grade nine			46.72
Gender	0 = Female			49.69
	1 = Male			50.31
Hukou type	0 = Non-rural Hukou			45.01
	1 = Rural Hukou			54.99
Ethnicity	0 = Other			8.11
	1 = Han			91.89
Only child	0 = No			56.15
	1 = Yes			43.85
Migrant status	1= No migration			82.80
	2 = Intra-provincial migration			8.08
	3 = Inter-provincial migration			9.12
Economic status	1= Poor			20.83
	2 = Moderate			73.33
	3 = Rich			5.85
Father's education level	0 = None, 6 = Finished elementary school, 9 = Junior high school degree, 12 = Senior high school degree (including technical secondary school, vocational high school), 15 = Junior college degree, 16 = Bachelor degree, 19 = Master degree or higher	10.35	3.12	
Mother's education level	0 = None, 6 = Finished elementary school, 9 = Junior high school degree, 12 = Senior high school degree (including technical secondary school, vocational high school), 15 = Junior college degree, 16 = Bachelor degree, 19 = Master degree or higher = 19	9.59	3.52	
School ranking	1 = Below average			18.84
	2 = Average			58.28
	3 = Above average			22.88
School type	0 = Public school			92.84
	1 = Private school			7.16

School Location	1 = Rural	36.55
	2 = Rural-urban fringe zone of the city/town	24.85
	3 = City/Town	38.60

Note. According to the Chinese school system, the number of years of schooling for parents is as follows: primary school = 6 years, junior high school = 9 years, technical secondary school/vocational high school/senior high school = 12 years, junior college = 15 years, bachelor's degree = 16 years, master's degree = 19 years, doctor's degree = 21 years. In the regression analysis, the years of education were used as a continuous variable.

3.3 Data Analysis Technique

All our statistical analyses were carried out in the Stata software, Version 17.0 (StataCorp, 2021). To examine the mechanism by which parental educational expectations affect the academic performance of junior high school students, we constructed the following two empirical models.

3.3.1 Basic Model Setting

The current study employed the educational production function to gauge the influence of parental educational expectations on the academic performance of their children. The mathematical equation is presented below:

$$Y = \beta_0 + \beta_1 PEE + \beta_2 LA + \beta_i X_i + \mu_i + \varepsilon \quad (1)$$

where Y is the dependent variable, including test scores and cognitive ability, PEE represents parental educational expectation, LA represents students' learning attitude, X_i is a series of control variables; μ_i is the class fixed effects, and ε is the error term. As standardized unified tests are not universally adopted across schools, it is only possible to compare students' academic performance within the same school. Furthermore, teaching is conducted based on the class as the fundamental unit. To ensure academic performance comparability among students, this study incorporates the class fixed effect in the model set to enhance the accuracy and validity of the empirical results.

3.3.2 Mediating Effect Analysis

To understand more comprehensively the potential impact of parental educational expectations on academic performance through the mediating variable of students' learning attitude, we used the causal steps approach proposed by Baron and Kenny (1986) to construct the mediation models. The fundamental premise of this approach is to consider X as the independent variable, M as the mediating variable, and Y as the dependent variable. The relationship between these variables can be described by the following equations (See Figure 1):

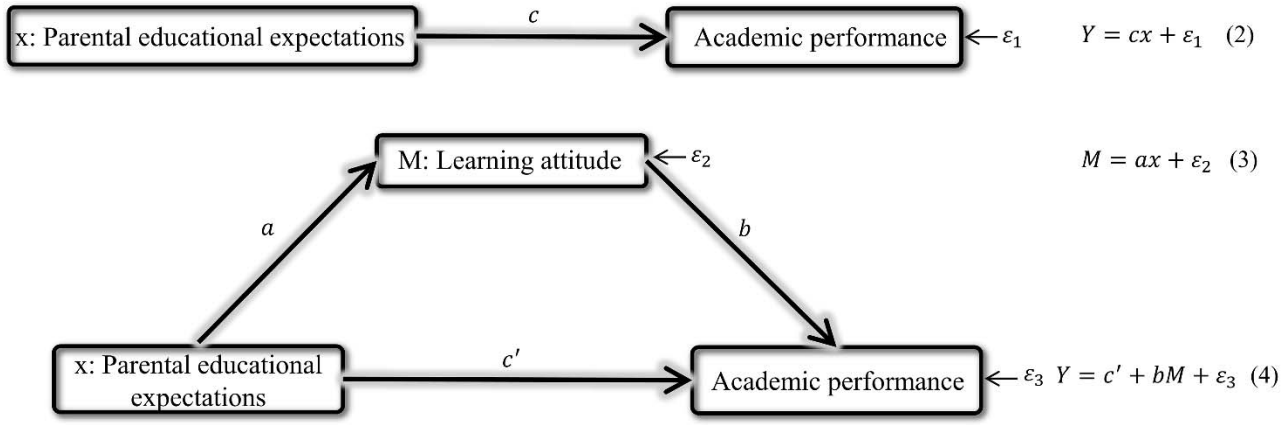

Figure 1. Mediating effect model

The coefficient c in Eq. (2) represents the total effect of the independent variable X on the dependent variable Y, which is the impact of parental educational expectations on the academic performance of junior high school students. The coefficient a in Eq. (3) reflects the effect of X on the mediating variable M, representing the influence of parental education expectations on the learning attitude of junior high school students. Furthermore, Eq. (4) elucidates the impact of parental educational expectations and learning attitude on the academic performance of junior high school students. The coefficient b denotes the impact of the mediating variable M on the dependent variable Y after controlling the effect of the independent variable X. Similarly, the coefficient c' signifies the direct effect of the independent variable X on the dependent variable Y after controlling the impact of the mediating variable M. Therefore, the mediating effect is equal to the indirect effect, which is the product of coefficient a and coefficient b.

However, this step-by-step approach has gradually exposed some limitations (Cerin et al., 2006; MacKinnon et al., 2002), and has been criticized (Edwards & Lambert, 2007; Hayes, 2009; Zhao et al., 2010). The Bootstrap approach is currently considered to be the preferred method of testing for mediating effects with high statistical validity (MacKinnon et al., 2002, 2004; Preacher & Hayes, 2008). Thus, the present study used the Bootstrap method to test the mediating effect based on 1000 sampling times. If the CI value of the indirect effect coefficients under the 95% confidence interval (bias-corrected) does not contain 0, it indicates statistical significance (Preacher & Hayes, 2008).

4. Results

4.1 Correlation Results

Table 2 reports zero-order correlations among the key variables. The results showed that all four variables were positively and significantly correlated at 0.001 level. In particular, the correlation between test scores and parental educational expectations (r = 0.354) as well as between test scores and students' learning attitude (r = 0.403) were significantly stronger than those between cognitive ability and parental educational expectations (r = 0.254) as well as

between cognitive ability and learning attitude (r = 0.227). Moreover, parental educational expectations were positively correlated with students' learning attitude (r = 0.276).

Table 2. Pearson correlations among dependent, independent, and mediating variables

Variables	1	2	3	4
1.Test scores	1			
2. Cognitive ability	0.362***	1		
3. Parental educational expectations	0.354***	0.254***	1	
4. Learning attitude	0.403***	0.227***	0.276***	1

Note. * P < 0.05, ** P < 0.01, *** P < 0.001.

4.2 OLS Regression Results

Table 3 presents the direct impact of parental educational expectations and students' learning attitude on academic performance, using stepwise regression analysis to highlight model sensitivity.

First, in terms of the test scores of junior high school students, Models 2 and 3 revealed a significant and positive effect of parental educational expectations on test scores (P < .001). That is, higher level of parental educational expectations increased the students' test scores. As a result, Hypothesis 1a is verified. Turning to Model 3, the effect of students' learning attitude was significantly and positively associated with test scores (P < .001), which meant that active learning attitude was positively associated with the likelihood of high test scores. Thus, Hypothesis 2a is supported.

Second, concerning the cognitive ability of junior high school students, Models 5 and 6 indicated that parental educational expectations had a significant and positive impact on cognitive ability (P < .001). In other words, the higher the parents' educational expectations, the higher the students' cognitive ability. Therefore, Hypothesis 1b is confirmed. At the same time, students' learning attitude significantly increased their cognitive ability (P < .001), which provided support for Hypothesis 2b.

Table 3. OLS results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Test scores	Test scores	Test scores	Cognitive ability	Cognitive ability	Cognitive ability
Grade	-0.051	1.217	2.894	-0.245*	-0.226	-0.204
	(3.960)	(3.699)	(3.490)	(0.119)	(0.117)	(0.116)
Gender	-12.198***	-11.492***	-8.955***	0.021	0.031**	0.065***
	(0.369)	(0.345)	(0.330)	(0.011)	(0.011)	(0.011)
Hukou type	0.970*	0.821	0.688	-0.005	-0.007	-0.009
	(0.475)	(0.444)	(0.419)	(0.014)	(0.014)	(0.014)
Ethnicity	-0.503	-0.164	-0.438	0.003	0.008	0.005
	(0.972)	(0.908)	(0.856)	(0.029)	(0.029)	(0.028)
Only child	1.075*	0.777	1.031*	-0.001	-0.006	-0.002
	(0.472)	(0.440)	(0.416)	(0.014)	(0.014)	(0.014)
Migrant status	2.046***	1.418***	1.207***	0.002	-0.007	-0.010
	(0.368)	(0.344)	(0.325)	(0.011)	(0.011)	(0.011)
Economic status	-0.018	0.275	-0.584	0.020	0.024*	0.012
	(0.407)	(0.380)	(0.359)	(0.012)	(0.012)	(0.012)
Father's education level	0.896***	0.616***	0.486***	0.016***	0.012***	0.010***
	(0.084)	(0.079)	(0.075)	(0.003)	(0.002)	(0.002)
Mother's education level	0.453***	0.260***	0.206**	0.011***	0.008***	0.007**
	(0.077)	(0.072)	(0.068)	(0.002)	(0.002)	(0.002)
School ranking	3.440	-1.109	-1.292	-0.058	-0.125	-0.127
	(5.303)	(4.954)	(4.674)	(0.159)	(0.156)	(0.155)
School type	7.045	5.710	7.199	-0.005	-0.024	-0.004
	(4.816)	(4.498)	(4.244)	(0.144)	(0.142)	(0.141)
School location	4.110	1.121	1.208	0.376***	0.331**	0.333**
	(3.557)	(3.323)	(3.135)	(0.106)	(0.105)	(0.104)
Parental educational expectations		5.890***	4.727***		0.087***	0.072***
		(0.119)	(0.115)		(0.004)	(0.004)
Learning attitude			8.351***			0.112***
			(0.184)			(0.006)
Constant	172.300***	152.671***	134.634***	-1.061***	-1.352***	-1.594***
	(9.967)	(9.317)	(8.799)	(0.298)	(0.294)	(0.291)
N	17,155	17,155	17,155	17,155	17,155	17,155
R-squared	0.159	0.266	0.347	0.326	0.347	0.360
Adj R-squared	0.136	0.247	0.329	0.308	0.330	0.343
Class	Control	Control	Control	Control	Control	Control

Note. 1) * P < 0.05, ** P < 0.01, *** P < 0.001. 2) Unstandardized regression coefficients are reported. 3) The numbers in parentheses are standard errors.

4.3 Learning Attitude as a Mediator between Parental Educational Expectations and Test Scores

In the regression results of Panel A presented in Table 4, Model 3 was tested by adding the mediating variable of learning attitude to Model 1 while controlling for the independent variable of parental educational expectations. The findings revealed a significant positive correlation between learning attitude and test scores (0.314 at P < .001). By comparing Model 1 with Model 3, we observed a decrease in the strength of the positive correlation between parental educational expectations and test scores, from 0.356 (P < .001) to 0.286 (P < .001), after controlling for the learning attitude. The combined results of Panel A indicated that learning attitude plays a partial mediating role in the relationship between parental educational expectations and test scores (as shown in Figure 2), thus verifying our Hypothesis 3a. That is, parental educational expectations have an indirect effect on students' test scores through their learning attitude.

Table 4. The mediating effect of parental educational expectations on test scores through learning attitude

	Panel A: Test scores			**Panel B: Cognitive ability**		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Dependent variables	Total score	Study attitude	Total score	Cognitive ability	Study attitude	Cognitive ability
Parental education expectation	0.356***	0.224***	0.286***	0.158***	0.224***	0.130***
	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)	(0.007)
Learning attitude			0.314***			0.126***
			(0.007)			(0.007)
Control	Yes	Yes	Yes	Yes	Yes	Yes
N	17,155	17,155	17,155	17,155	17,155	17,155
R-squared	0.266	0.181	0.347	0.347	0.181	0.360
Adj R-squared	0.247	0.159	0.329	0.330	0.159	0.343

Note. 1) * P < 0.05, ** P < 0.01, *** P < 0.001. 2) Standardized regression coefficients are reported, with standard errors in parentheses. 3) The numbers in parentheses are standard errors.

To confirm the robustness and validity of the mediating effect, we utilized the Bootstrap method to test the mediation effect while controlling for individual, family, and school variables during the analysis. As illustrated in Table 5, the Bootstrap estimate indicated a significant mediating effect of students' learning attitude on the association between parental educational expectations and test scores (coefficient = 0.070, 95% Bootstrap CI = [0.065, 0.079]; P < .001). The mediating effect was found to account for 19.74% of the total effect. Therefore, it further validates our Hypothesis 3a.

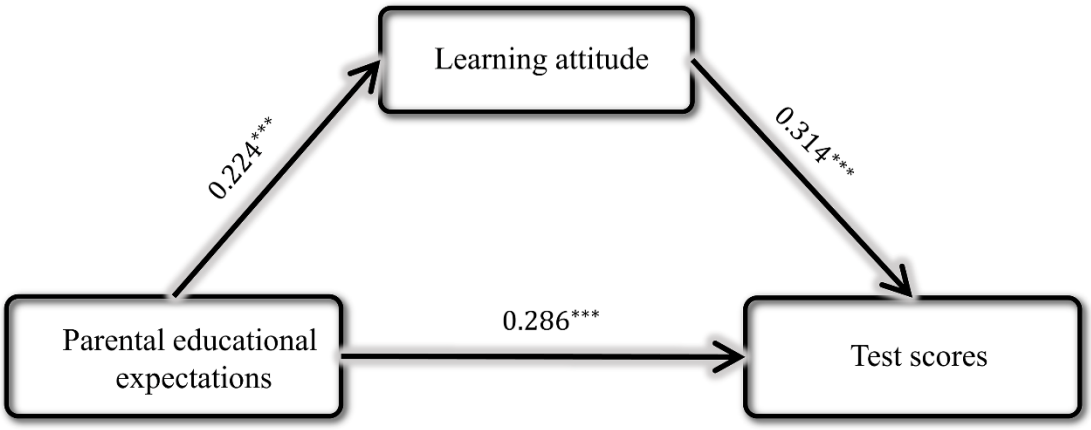

Figure 2. Standardized path coefficient of junior high school students' test scores.

Table 5. The mediation effect size of students' learning attitude and its proportion in the effect of parental educational expectations on test scores

Effect	Path	Effect size	Bootstrap SE	95% Bootstrap CI	Proportion
Direct effect	Parental educational expectations → Test scores	0.286***	0.004	[0.276, 0.290]	
Indirect effect	Parental educational expectations → Learning attitude → Test scores	0.070***	0.004	[0.065, 0.079]	0.197
Total effect		0.356***			

Note. 1) * P < 0.05, ** P < 0.01, *** P < 0.001. 2) Standardized regression coefficients are reported.

4.4 Learning Attitude as a Mediator Between Parental Educational Expectations and Cognitive Ability

In Panel B of Table 4, regression results from Model 6 incorporated students' learning attitude. Controlling for parental educational expectations, there was a significant positive correlation between learning attitude and cognitive ability (0.126 at P < .001). By comparing Model 6 and Model 4, it can be observed that the effect size between parental educational expectations and cognitive ability decreased from 0.158 (P < .001) to 0.130 (P < .001) after controlling for the mediating variable of learning attitude. Integrating the findings from Panel B, it is evident that learning attitude acts as a partial mediator between parental educational expectations and cognitive ability (as shown in Figure 3). This supports our Hypothesis 3b that parental educational expectations influence students' cognitive ability through their learning attitude.

Similarly, to assess the robustness and validity of the mediation effect, we conducted the Bootstrap method while controlling for individual, family, and school variables during the analysis process. As presented in Table 6, the Bootstrap estimate indicates a significant

mediating effect of students' learning attitude on the association between parental educational expectations and cognitive ability (coefficient = 0.028, 95% Bootstrap CI = [0.026, 0.031]; P < .001). The mediating effect accounted for 17.88% of the total effect. These findings further support Hypothesis 3b.

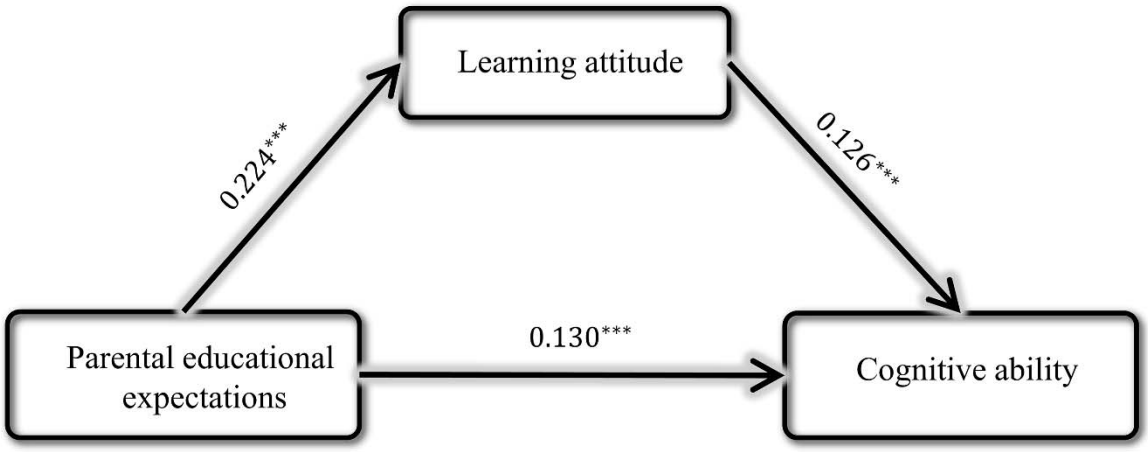

Figure 3. Standardized path coefficient of junior high school students' cognitive ability.

Table 6. The mediation effect size of students' learning attitude and its proportion in the effect of parental educational expectations on cognitive ability

Effect	Path	Effect size	Bootstrap SE	95% Bootstrap CI	Proportion
Direct effect	Parental educational expectations → Cognitive ability	0.130***	0.006	[0.124, 0.143]	
Indirect effect	Parental educational expectations → Learning attitude → Cognitive ability	0.028***	0.002	[0.026, 0.031]	0.179
Total effect		0.158***			

Note. 1) * P < 0.05, ** P < 0.01, *** P < 0.001. 2) Standardized regression coefficients are reported.

5. Conclusion and Discussion

The primary goal of this study was to investigate the effects of parental educational expectations and learning attitude on the academic performance of junior high school students and to further analyze the mediating role of learning attitude between parental educational expectations and academic performance. By analyzing the CEPS baseline data (CEPS 2013), empirical evidence was generated, leading to the following research findings.

Our first hypothesis predicted that parent educational expectations were significantly and positively associated with the academic performance of junior high school students. This

hypothesis was supported by our ordinary least squares results. In other words, positive parental expectations are not only beneficial for children to achieve better test scores in examinations but also promote their cognitive development. These findings are consistent with previous research conclusions (Jeynes, 2024; Ji et al., 1993; Poon, 2020; Yamamoto & Holloway, 2010; Zhang et al., 2020; Zimmerman et al., 1992).

However, it should be noted that parental educational expectations have a stronger impact on the test scores of junior high school students than on their cognitive ability. From Model 1 to Model 2 in Table 3, it can be seen that with the addition of parental educational expectations, the R-square of junior high school students' test scores increased from 15.9% to 26.6%. However, from Model 4 to Model 5, the R-square of cognitive ability only increased from 32.6% to 34.7%. This implies that for students, the most tangible indicator of academic success is achieving good grades, and parental expectations can significantly contribute towards it. In contrast, cognitive ability is more of a long-term accumulation process. Our analysis also found that control variables at the individual, family, and school levels explained a large portion of the variance in cognitive ability. This means that family, society, and even peers play a role in the formation of adolescents' cognitive abilities.

Our second hypothesis surmised that the learning attitude of junior high school students was significantly and positively associated with their academic performance. Our ordinary least squares analysis supports this hypothesis and reveals that learning attitude plays a crucial role in both test scores and cognitive ability of junior high students. This finding is consistent with Zimmerman et al.'s (1992) conclusion that student self-motivation is the key to academic attainment. Learning attitude encompasses aspects such as students' attitudes, motivations, and learning strategies towards learning, all of which are closely related to academic success. A positive learning attitude not only stimulates students' academic interest but also enhances their academic motivation and the effectiveness of learning strategies, all of which collectively contribute to improving academic performance. Several studies have been conducted to support this idea (Kpolovie et al., 2014; Mensah et al., 2023; Schunk & DiBenedetto, 2020).

Nevertheless, it is worth noting that the influence of learning attitude on test scores outweighs that on cognitive ability. From Model 2 to Model 3 in Table 3, the addition of learning attitude increased the R-square of test scores from 26.6% to 34.7% for junior high school students. However, regarding cognitive ability, the inclusion of learning attitude in Model 6 only led to a 1.3% increase (from 34.7% to 36.0%). This indicates that the learning attitude is to some extent related to the development of cognitive ability, although this association may take a long time to manifest. At the same time, these findings remind us that there is a complex interrelationship between learning attitude and cognitive ability, which may unfold over an extended period. Future research in adolescent development, educational interventions, and training, as well as studies focusing on affect and motivation, can further illuminate these relationships.

Our final hypothesis stated that the learning attitude of junior high school students acts as a mediator in the relationship between parental educational expectations and academic

performance. This hypothesis was confirmed through mediation analysis and the Bootstrap method. First, parental educational expectations not only have a direct impact on students' test scores but also an indirect impact through learning attitude. Second, parental educational expectations were also found to have both direct and indirect associations with students' cognitive ability, with learning attitude serving as the mediator. These results are consistent with prior research findings from Japan in that parental involvement can affect academic achievement by influencing students' attitudes and aspirations (Otani, 2020). In fact, parental educational expectations have been found to have a lasting impact on children's academic performance. For example, early parental educational expectations continue to play a significant role in their academic achievement during their middle school years (Froiland et al., 2013). As McNeal (2014) pointed out, the expectations and beliefs of parents have a profound and subtle impact on their children's values and behavioral attitudes. Therefore, our findings suggest that parental educational expectations could be a crucial factor in shaping children's attitude toward learning and even influencing the development of their study habits, which is beneficial for future research directions.

Furthermore, it is worth mentioning that the proportion of the mediating effect of learning attitude in the relationship between parental educational expectations and test scores (19.7%) is higher than the proportion of the mediating role of learning attitudes in the relationship between parental educational expectations and cognitive abilities (17.9%). Even so, parental educational expectations are a positive psychological energy that can help students develop a positive attitude toward learning and improve overall academic performance. Essentially, research on children's development and education issues should pay attention to the crucial role of parents' educational expectations in shaping students' cognitive abilities and academic performance, especially in the social context of China.

Although this study makes valuable contributions to our understanding of the relationship between parental educational expectations, learning attitude, and academic performance of junior high school students in China, there are some limitations that should be considered. First, the construct of learning attitude encompasses multiple indicators, such as learning time and engagement, which were not systematically measured due to the limitation of the questionnaire. Consequently, the present investigation was contingent upon the comprehensive appraisal of children's learning attitude by their parents, which may not completely encompass the intricacies and subtleties of this construct. Second, although parental educational expectations and learning attitude had significant effects on junior high school students' cognitive ability, their proportions were relatively small. These findings suggest that future studies should explore other factors that may impact junior high school students' cognitive ability to gain a more comprehensive understanding of these relationships.

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