

# The Relationship between Parental Involvement, Educational Expectations, and Adolescent Academic Achievement: A Meta-analysis Based on 14 Empirical Studies

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**Abstract:** Academic achievement is one of the most important ways of evaluating education. Using a meta-analytic approach, the article synthesized 116, 728 samples from 14 independent empirical studies on the effects of parental involvement and self-educational expectations on adolescents' academic achievement. Random effects models found significant positive correlations between parental involvement and academic achievement, parental involvement and self-educational expectations, and self-educational expectations and adolescents' academic achievement, with self-educational expectations mediating the relationship significantly between parental involvement and academic achievement. The moderation analysis found that parental involvement in the process of influencing academic achievement was significantly higher in the junior high school than in the elementary school; parental involvement in the process of influencing educational expectations was significantly higher in the central region than in the eastern region, significantly higher in the junior high school than in the elementary school, and significantly higher in the rural than in the urban regions. The influence of educational expectations on academic achievement was significantly higher in the central region than in the western region. The study provides strong evidence for the prediction of adolescents' academic achievement and validates the general applicability of the model in the adolescent population. Further implementation of high quality parental involvement and self-education expectations

is recommended.

**Keywords:** Adolescent Academic Achievement; Parental Involvement; Educational Expectations; Meta-Analysis

## 1. Introduction

Young people are the main force of future scientific and technological development and the important reserve of a country's talent, and their academic performance has always been a hot topic in the field of education. Academic performance plays an important role in the selection of top talents and the competition in the field of science, technology and innovation, and the Family Education Law of the People's Republic of China came into force on January 1, 2022, elevating family education from a traditional "family matter" to a "national matter" of the new era embodied in the will of the state. The German educator Friedrich Wilhelm Friedrich Flaubert once pointed out that "the destiny of a nation is not so much in the hands of those in power as in the hands of its mothers". Parental involvement in childcare is an important component that distinguishes it from school and society<sup>[1]</sup>. A number of domestic and international studies on the impact of parental involvement and the academic performance of students at the basic education level have shown that parental involvement is significantly and positively correlated with students' academic performance<sup>[2,3]</sup>. However, some studies have found that there is an insignificant or negative correlation between parental involvement and students' academic performance. For example, Li Jiali and other scholars have found that parent-child communication and cultural

accompaniment have no effect on students' cognitive ability, and parental involvement has a significant negative correlation on students' ability, which is deduced to be related to parent-child communication skills and learning counseling methods, and varies with the students' grade level<sup>[4]</sup>. In addition, other studies have found that parental involvement has a significant negative impact on the academic performance of left-behind children, which may be due to the "intermittent roughness" parental involvement triggered the "rebellious" psychology of left-behind children, which ultimately led to the decline in academic performance<sup>[5]</sup>.

Bandura, the proponent of social cognitive theory, argued that individuals are self-organizing, proactive, self-reflective, and self-regulating, and that human functioning is a product of what he called reciprocal determinism, or the dynamic interplay of three forces: personal factors, behaviors, and environmental influences, which interact to affect an individual's behavior<sup>[6]</sup>. Adolescence is a critical period of mental development and is subject to significant influences from the home environment, parental involvement, and self-expectations. At this stage, adolescents introduce self-concepts, orient themselves, and begin to think about who they can be, who they want to be, and who they are afraid of becoming. Adolescents actively construct expectation-oriented "want-to-be selves," such as raising self-educational expectations and working hard on academic achievement in order to live up to their parents' efforts<sup>[7]</sup>. Therefore, parental involvement has an impact on students' self-educational expectations, and the expectancy-value theory proposed by Eccles, Wigfield and other scholars emphasizes the influence of external environmental factors on individual educational expectations. The family is an important place for children's activities, parents are important others for children, and the family and parents play a key role in the individual's educational expectations. Expectancy-value theory constructs include ability beliefs, expectations of success, and subjective task values, which can be used to explain how motivation affects choice, persistence, and performance, and the degree to which an individual's performance outcomes are superior or inferior in an activity, as well as

the degree to which the activity is valued, affects the individual<sup>[8]</sup>. Adolescents' academic performance is susceptible to educational expectations, which can alter self-goal orientation and effort.

In summary, the process of the influence of parental involvement on academic performance is characterized by complex structural relationships, a large number of moderating factors, and inconsistent conclusions from multiple studies<sup>[9]</sup>. The reason for this is that a single study limits the comprehensive perception of the impact of parental involvement on academic performance, resulting in the current role of the mechanism and the degree of impact on adolescents' academic performance still does not have a clear and consistent perception of the role of the mechanism and the degree of impact<sup>[3]</sup>, for the theme of the domestic research on the topic of the integration of multiple facets of the integration of the quantitative research is relatively small, and adolescents self-education expectations of the mediating role of the role of the play of the unknown. In view of this, a meta-analysis of previous research results was conducted to apply multiple studies to a single model and thus explore the best evidence. In this study, we used meta-analytic structural equation modeling (MASEM) to incorporate the mediating variable of self-educational expectations using data from 14 independent samples including 116, 728 adolescent cohorts in China to study the mechanism of parental involvement on adolescents' academic performance, and to provide theoretical support and empirical evidence for domestic adolescents' academic performance enhancement strategies and influencing mechanisms, etc., through integrated quantitative analyses.

## 2. Literature Review

### 2.1 Literature Sources

Literature sources used in this paper include journal articles from China Knowledge Network (CNKI), Wanfang Database and Wipo Database, as well as empirical research literature from excellent master's and doctoral dissertations. The search was limited to literature from the last 10 years, i. e., from January 1, 2012 to September 20, 2022. The

search was conducted using the Boolean algorithm, and other expressions for "parental involvement" were "parental input", "parental participation", "family involvement", etc., and "academic achievement" and "academic performance", "learning outcomes", "test scores" and so on. ", "test scores" and other expressions, and by searching the references of the key literature to determine if there were any omissions, removing studies that did not fit the topic of this paper, were not rigorous, did not provide sufficient data, and eliminating duplicates from multiple databases.

## **2.2 Literature Screening**

In the literature, "parental involvement" generally refers to the extent to which parents are interested in, aware of, and willing to participate in their children's daily lives<sup>[10]</sup>. "Parental involvement" and "educational engagement" are synonymous with "parental involvement", which refers to the involvement of parents in their children's education and the range of behaviors<sup>[11]</sup>. parents take for their children's development. Parental involvement includes parental communication and academic guidance, paternal expectations, and parental involvement in their children's school activities<sup>[4,12,13]</sup>. Most scholars from Coleman's empirical study on parental involvement in intergenerational closure have proposed that parental intergenerational closure is defined as the number of children's friends that parents know, the number of other parents they know, the frequency of communication and familiarity with other parents, and so on<sup>[4,14,15]</sup>. Domestic scales on parental involvement include the Parental Involvement Scale developed by Song Bing, which includes emotional involvement, governance involvement, and behavioral management involvement of both parents. In addition, there is the Parenting Involvement Scale for Elementary School Pupils developed by Wu Yifang et al. in 2013, which includes family monitoring, academic counseling, parent-child communication, joint activities, and school communication dimensions<sup>[16]</sup>. Educational expectations generally refer to the expectations and desires of family members or the person himself/herself regarding the education to be acquired<sup>[5]</sup>, and this paper specifically refers to self-educational expectations. Although educational expectations do not play a decisive

role in an individual's future achievement, adolescence is a critical socialization period for concept formation and identity building<sup>[17]</sup>, and educational expectations are mostly measured using student self-assessment questionnaires, such as "What level of academic achievement do you want to achieve?" "Academic performance" can also be explained in the literature using terms such as "academic performance" and "academic achievement". According to foreign studies, academic performance includes the grade level of a student's subject matter, performance on standardized tests, etc<sup>[1]</sup>. Academic performance refers to specific test scores or grades of academic achievement, which reflect what students know and can accomplish at a certain moment, and is one of the important things in the evaluation of education and teaching<sup>[18]</sup>. Examinations of all types are a common method of checking and evaluating the effectiveness of teaching and learning. In the literature summarized in this paper, academic performance is defined as a combination of subject test scores or school exams.

Based on the above understanding of the retrieved relevant literature was screened based on the following criteria: (1) it must be empirical research literature; (2) the research constructs of the literature include at least any two constructs of parental involvement, self-education expectation, and academic achievement; (3) the literature should provide a clear sample size, correlation coefficient of the research constructs,  $r$ , or a standardized regression value ( $\beta$ ) that can be transformed into  $r$ ; (4) the object of the study is a group of adolescents in China; (5) duplicate published data were included only in the more comprehensive one; and (6) parental involvement refers to dual joint participation, not unilateral participation. Based on the above inclusion and exclusion criteria, further reading of titles, abstracts, and full text, 14 articles of related literature were finally included, containing 15 independent effect sizes and a sample of 116, 728 adolescents, and data were entered jointly by two doctoral students in education.

## **2.3 Literature Statistics**

The statistical processing procedure of this paper is as follows: firstly, the statistics of

meta-analysis were performed using Comprehensive Meta-Analysis (CMA3.0) software, including effect value transformation, heterogeneity test, publication bias analysis, and effect value merging. If the correlation coefficient  $r$  between the constructs was not provided in the literature, but only the standardized regression coefficients between the variables, the standardized regression coefficients were converted to correlation coefficients using the conversion formula, which was  $r = 0.98\beta + 0.05$  ( $\beta \geq 0$ ),  $r = 0.98\beta - 0.05$  ( $\beta < 0$ ),  $\beta \in (-0.5, -0.5, -0.5)$ . Coefficient corrections for variable correlation coefficients across the original studies were also performed following the steps proposed by Hunter and Schmidt using R-Fisher's Z-R. If the reliability coefficients were not reported in the literature, the weighted average reliability of other studies was used instead<sup>[19]</sup>. Based on the above procedure, the correlation matrix relationships were entered into AMOS 23.0 for path relationship analysis between the constructs, and the mediation effect in the hypotheses was determined by taking 5,000 Bootstrap samples method to determine whether there is a significant relationship, and the mediation effect is significant if the 95% confidence interval does not include zero. Since the sample size is not the same in different literatures, referring to the suggestion of Viswevaran and other scholars, the sample size in the analysis stage of structural equation modeling is the reconciled average of the correlation coefficients associated with each set of correlation coefficients.

### 3. Research Hypotheses

Parental involvement as family human capital is an important predictor variable of academic performance<sup>[20]</sup>. Several studies have shown that parental involvement and parental support have a positive effect on students' academic performance and homework, and that under the parental involvement model, children are able to better control their attention, behavior, academic performance, classroom disruptive behavior, and other aspects of their performance, and in particular, high-perceived parental involvement and autonomy support can be a better predictor of students' academic performance<sup>[10]</sup>. Based on the China Education Tracking Survey (CETS), Lu Changfeng and

other scholars found that parental involvement is beneficial to children's academic performance, and concluded that the parent-child relationship plays a mediating role, which affects children's academic performance<sup>[21]</sup>. Based on the classical human capital theory and family decision-making model, found that compared with students from agricultural households and rich families, students from non-agricultural households and poor families have a clearer understanding of "studying changes one's destiny" and a deeper perception of parental involvement in education, and that students with this identity are more conducive to the improvement of students' academic performance<sup>[10]</sup>. Students with this identity characteristic are more favorable to the improvement of students' academic performance. Through the meta-analysis of foreign literature, found that parental involvement is more relevant to the improvement of students' academic performance in kindergarten and elementary school groups<sup>[22]</sup>. Coleman suggests that parental involvement and intergenerational closure in social capital are beneficial to students' growth and development, and have a significant increase in students' cognitive ability, in which intergenerational closure includes accompanying the child, communicating with the child's teacher, and communicating with the child's friends, etc<sup>[23]</sup>. In conclusion, the research hypothesis is proposed:

H1: Parental Involvement has a significant positive effect on Academic Achievement;

According to Liu Baozhong, parental involvement not only directly affects academic performance, but also indirectly improves children's educational expectations<sup>[20]</sup>. Some scholars have also found that parental involvement can significantly increase the self-education expectation of students with father's lack of education through the big data of the China Education Tracking Survey<sup>[24]</sup>. Based on big data, Zhou Fei, Cheng Tianjun and other scholars found that parental involvement in education has a significant effect on the educational expectations of both male and female students, and the educational expectations of male students are greater than those of female students<sup>[25]</sup>. Therefore, parents are the most important social roles of students, and parental involvement can directly affect



students' educational expectations. In conclusion, the research hypothesis is proposed:

H2: Parental Involvement has a significant positive effect on Educational Expectations; According to Bandura's social cognitive theory, it is known that adolescents, in order to construct their ideal selves, increase their academic performance when their educational expectations increase. A number of domestic and international studies have demonstrated the important intrinsic effect of self-educational expectations on academic performance, which is even higher than the effect of parental educational expectations on children's academic performance<sup>[26,27]</sup>. It has also been shown that educational expectations can effectively drive students' motivation to succeed and contribute to their level of effort during school. Individual students' educational expectations have a significant impact on student achievement<sup>[28,29]</sup>. In summary, the research hypothesis is proposed:

H3: There is a significant positive effect of educational expectations on academic achievement;

Scholars such as Shiao-Lin Kuo and others pointed out that self-educational expectations are a factor in the impact of parental educational involvement on academic performance, in addition to other mediating factors that come into play<sup>[2]</sup>. Jean M. Gerard and other scholars found that adolescents' school performance mediated the relationship between individual adolescents' perceived academic support and school performance<sup>[30]</sup>. Liang Wenyan and other scholars found that parental involvement had a sustained positive effect on the cognitive abilities of migrant children, in which self-educational expectations played a mediating role<sup>[31]</sup>. In summary, the research hypothesis is proposed: H4: Educational expectations mediate the relationship between parental involvement and academic achievement.

## **4. Analysis of Results**

### **4.1 Heterogeneity Analysis**

The study involved 3 constructs of parental involvement, educational expectations and academic achievement with a total of 3 sets of correlation coefficients for effect value calculation. Heterogeneity was tested through

the Q and fail-safe book values calculated by CMA software, and the results are shown in Table 1. Following Rosenthal's recommendation, no publication bias can be demonstrated when the fail-safe coefficient is between 100-500<sup>[32]</sup>. In addition, the heterogeneity of each effect value was tested by the Q statistic<sup>[33]</sup>. A significant Q value indicates sample heterogeneity, and the overall mean correlation coefficient is modeled using a random effects model. The random effects model can be used by increasing the weight of a small sample or weakening the weight of a large sample, which makes to produce a larger confidence interval data in order to obtain more reliable conclusions of the analysis<sup>[19]</sup>, and the presence of moderating factors affecting the sample. The minimum value of the fail-safe coefficient for the relationship of the three groups of variables in this study is 861 and the maximum value is 2718, which are higher than the recommended values and there is no publication bias. As shown in Table 1, there is a significant positive effect of parental involvement on academic achievement, and the research hypothesis H1 is proved; there is a significant positive effect of parental involvement on educational expectations, and the research hypothesis H2 is proved; and there is a significant positive effect of educational expectations on academic achievement, and the research hypothesis H3 is proved.

### **4.2 Effect Size Analysis**

The effect sizes were analyzed for 14 independent samples (including 116, 728 primary and secondary school students' data), as shown in the matrix of correlation coefficients in Table 2, with the diagonal line being the average validity of each construct and the rest being the correlation coefficients between the three study constructs. It can be seen that the correlation coefficients between the study variables ranged from 0.195 to 0.337, all of which reached the level of significance, and with reference to the reference standard proposed by Lipsey and Wilson,  $|r| \geq 0.40$  is considered a high effect value,  $|r| = 0.25$  is considered a medium effect value, and  $|r| \leq 0.10$  is considered a low effect value, therefore, the vast majority of the relationships between the variables of the present study showed medium to high strength correlation. The correlation matrix of the

variables at this stage was imported into the AMOS software for Meta-SEM analysis, and the sample size was analyzed using the reconciled mean ( $n=25138$ ), and the

measurement error was set to  $(1-\alpha)$ , where  $\alpha$  is the mean reliability of the integrated sample<sup>[34,35]</sup>.

**Table 1. Bivariate Correlation Analysis**

Hypothetical Relationship	K	N	r	Error	95%Confidence Interval		Q-value	Fails'K
					Lower Limit	Upper Limit		
<b>H1: PI-AR</b>	10	98565	0.195***	0.041	0.116	0.271	0.000	2718
<b>H2: PI-SEE</b>	5	13665	0.276***	0.057	0.166	0.378	0.000	861
<b>H3: SEE-AR</b>	6	27764	0.337***	0.051	0.243	0.426	0.000	3442

Note: K is the number of studies or the number of independent samples; N is the total number of samples; r is the mean effect value; Fais K is the publication bias, meaning how many unpublished studies that show a zero effect are needed to make the mean effect size change from significant to non-significant in the literature; and \*\*\* denotes a p-value less than 0. 001.

**Table 2. Variable Correlation Matrix**

variant	1	2	3
<b>PI</b>	0.830		
<b>SEE</b>	0.276	0.870	
<b>AR</b>	0.195	0.337	0.820

### 4.3 Reconciliation Impact Analysis

Based on the information provided by the sample, the effect of parental involvement on academic achievement was influenced by region and academic level, respectively. The results are shown in Table 3. It was found that the correlation between parental involvement and academic achievement was higher in junior high school than in elementary school ( $0.260>0.146$ ,  $Q=4.329$ ,  $p<0.05$ ), with a significant between-group difference, and that the central part of the country was higher than the eastern part and higher than the western part of the country in the correlation of the regional variable ( $0.342>0.317>0.282$ ), with no significant between-group difference.

The correlation between parental involvement and educational expectations was higher in the central region than in the eastern region ( $0.340>0.020$ ,  $Q=24.395$ ,  $p<0.05$ ), with a significant between-group difference; in the section variable, the junior high school stage was higher than the elementary school stage ( $0.294>0.020$ ,  $Q=12.807$ ,  $p<0.05$ ), with a significant between-group difference; and in the region variable, the rural area was significantly higher than the urban area ( $0.492>0.020$ ,  $Q=57.440$ ,  $p<0.05$ ), with a

significant between-group difference.

In the variable relationship between educational expectations and academic achievement showed that the central region is significantly western region ( $0.500>0.212$ ,  $Q=7.982$ ,  $p<0.05$ ), there is a significant between-groups difference; in the variable of school segments junior high school is higher than the elementary school level ( $0.359>0.200$ ,  $Q=0.691$ ,  $p>0.05$ ), there is a significant between-groups difference.

### 4.4 Path Analysis

The correlation coefficient matrix was imported into the AMOS software for meta-analysis,  $\alpha$  denotes mean reliability,  $(1-\alpha)$  denotes measurement error, and the sample size was analyzed using the reconciled mean sample size ( $n=25138$ ), and Meta-path analysis was performed on the data from the independent samples.

The meta-analytic structural model path was further analyzed using Bootstrap analysis to test the mediating effect of the hypothesized model. As shown in Table 4, the mediating effect of educational expectations between parental involvement and academic achievement was significantly established. The 49. 5% of the indirect effect of the effect of parental involvement on academic achievement indicates that educational expectations explain the mediating mechanism of parental involvement on academic achievement is significant and the research hypothesis H4 is proved.

**Table 3. Regulatory Impact Analysis**

Hypothetical Relationship	Adjust variables	Level	k	N	r	95%Confidence Interval		Q-value	p-value
						Lower Limit	Upper Limit		
<b>PI-AR</b>	Region	Eastern	3	2338	0.178	0.070	0.282	0.758	0.685

PI-SEE		Western	1	709	0.170	-0.013	0.342		
		Central	4	9043	0.232	0.143	0.317		
	Section	Junior high school	5	12991	0.260	0.188	0.330	4.329	0.037
		Elementary school	4	9828	0.146	0.065	0.226		
	Region	Eastern	1	379	0.020	-0.081	0.120	24.395	0.000
		Central	1	525	0.340	0.262	0.414		
	Section	Junior high school	2	11254	0.294	0.225	0.360	12.807	0.000
		Elementary school	1	379	0.020	-0.115	0.155		
	Region	City	1	379	0.020	-0.081	0.120	57.440	0.000
		Country	1	497	0.492	0.422	0.556		
SEE-AR	Region	Eastern	2	1152	0.330	0.201	0.448	7.982	0.018
		Western	2	15358	0.212	0.089	0.329		
		Central	1	525	0.500	0.339	0.633		
	Section	Junior high school	5	27385	0.359	0.230	0.476	0.691	0.406
		Elementary school	1	379	0.220	-0.105	0.502		

Note: k represents the number of studies, N denotes the sample size of students, and R represents the weighted average correlation coefficient. Due to sample size limitations, the moderating factors of each relationship were not fully analyzed.

**Table4. Results of the Mediation Effect Bootstrap Test**

Path	effect sizes	Product of coefficients		Bootstrapping				Supports what-if
				Bias-corrected		Percentile		
		Standard error	Z-value	Lower	Upper	Lower	Upper	
Indirect effect	0.117***	0.004	29.250	0.110	0.124	0.110	0.124	Support
Direct effect	0.119***	0.008	14.875	0.105	0.135	0.104	0.134	Support
Total effect	0.236***	0.007	33.714	0.222	0.251	0.222	0.251	Support
Effect ratio	0.495	0.019	26.053	0.459	0.534	0.459	0.534	

Note: \*\*\*indicate  $P < 0.001$

## 5. Conclusions and Insights

### 5.1 Conclusions of the Study

This paper provides a quantitative overview of the effects of parental involvement and self-educational expectations on adolescents' academic achievement and their mechanisms of action through a meta-analysis of empirical studies with a sample of 116, 728. Through bivariate analysis, it is found that there is a direct and significant positive correlation between parental involvement and academic achievement, parental involvement and self-educational expectations, and self-educational expectations and adolescents' academic achievement, and the mediation of self-educational expectations between parental involvement and academic achievement is significant. However, there was heterogeneity across studies, with regional, school segment, and district factors moderating the correlations between variables. The moderating effect found that parental involvement was significantly higher in the junior high school than in the elementary school; parental

involvement was significantly higher in the central region than in the eastern region, in the junior high school than in the elementary school, and in the rural region than in the urban region; and in the influence of educational expectations on academic achievement, the central region was significantly higher than the western region.

### 5.2 Research Implications

First, high-quality parental involvement should be implemented to actively promote parental involvement in science education. In terms of overall effects, parental involvement positively contributes to children's educational expectations and academic achievement, but a number of studies have also found that parental involvement hinders academic achievement. Therefore, parents need to pay attention not only to the "quantity" of involvement, but also to the "quality" of "involvement". Parents need to focus not only on the improvement of their children's academic cognitive abilities, but also on the development of their children's non-cognitive abilities. Parental involvement in education can maximize the effective

intergenerational transfer, the premise of the children's perception of parental involvement in education, harmonious parent-child relationship, positive emotional autonomy support and trust. If parents focus on their children's external academic performance, ignoring the children's learning burnout, helplessness, self-doubt, emotional distress, unable to give strong emotional support, empathy and understanding, and ignore the children's self-efficacy and self-motivated development, it will result in the parents' influence on the children can not form a positive loop, inevitably resulting in the "hate iron is not enough to be steel" Inevitably, this results in ineffective participation in a state of self-anxiety.

Secondly, the impact of family human capital on students should be viewed dialectically. Parents as an important family human capital of students, some students have a unique advantage, but it is undeniable that more students are facing the objective fact of low parental involvement, such as students in rural areas and low-education parents, migrant children, left-behind children and so on, in the unfavorable situation of parental involvement in the students, their parents may be faced with the objective contradiction of the loss of the family's livelihood and the children's education and can not be reconciled. However, studies have confirmed that parental involvement still has a beneficial effect on children's education in disadvantaged families. This study also confirms the self-reporting effect of expectation that students from relatively disadvantaged groups are more sensitive to parental involvement and are more likely to benefit from parental involvement, and that these students may have a better understanding of their own predicaments, and are better able to overcome their objective predicaments from internal factors, thus improving their academic performance. Although this group of students may not be able to receive "visible" face-to-face guidance from their parents in a timely manner, if they can perceive their parents' implicit involvement in the form of increased attention, expectations, care, and trust, this may help to promote their children's non-cognitive abilities, such as self-efficacy, self-esteem, perseverance, academic self-concept, positive resilience, and so on. The objective gap with the advantaged group can also be

mitigated.

Finally, it should be noted that the study was unable to incorporate enough moderating variables in the model due to the limitations of the information and empirical data available in the existing literature. With the expansion of relevant research and data, possible moderating variables for the various types of relational pathways in this theoretical framework, such as gender, discipline, parental literacy, school type, parent-child relationship, and scale type, can be further tested in the future.

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