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Study on the Impact of Urban-Rural Education Resource Equitability and Student Endowment Differences on Promoting Educational Equity

-- Based on empirical analysis of CEPS

Chenghao Han

Beijing Haidian Foreign Language Experimental School, Beijing 100000, China

Abstract: Based on the empirical analysis of the China Education Panel Survey (CEPS), this paper explores the impact of the equitability of urban-rural education resources and student endowment differences on educational equity. The findings not only provide a new perspective and empirical support for the study of the theory of educational equity but also offer valuable references for policymaking and education reform to promote social equity and harmonious development. It is empirically found that cognitive abilities and parents' educational expectations have a positive impact on students' educational expectations, while the dropout situation of friends has a negative impact. Additionally, although health status has a positive influence on educational expectations, it does not significantly affect the choice of future residence. These factors together reveal the significant impact of the family environment, personal ability, and social relationships on students' education and life choices, emphasizing the necessity to optimize educational resources and family education support, holding significant theoretical and practical significance.

Keywords: Urban-rural Education Resources; Student Endowment; Educational Equity.

1. Introduction

In the current research fields of educational psychology and sociology, students' educational expectations and the choice of future residence are widely considered key factors affecting their long-term development and social mobility. Many studies have explored the impacts of family background, personal abilities, and the social environment on students' future choices, but these studies often focus on data and scenarios from Western countries. In a rapidly developing country like China, where educational resources are extremely unevenly distributed, there is relatively little research. Although some studies focus on Chinese students, they are mostly concentrated at the primary education stage, with few studies on the educational expectations of middle school students and their expected choices of future residence. Moreover, existing studies often fail to fully consider individual differences among students, such as cognitive abilities and health conditions, and how these factors interact with family educational expectations and peer influences to shape students' expectations and choices.

The factors influencing students' educational expectations not only shape their future academic and career paths but also have a profound impact on individual social mobility. Firstly, as a core factor affecting educational expectations, students with stronger cognitive abilities can grasp complex concepts and skills more quickly, enhancing their willingness and motivation to pursue higher education. Secondly, health conditions also significantly affect students' educational expectations; a healthy body ensures that students can participate better in learning activities, and a good psychological state enhances their resilience to stress and challenges during the learning process. Besides the influences of cognitive abilities and health conditions originating from the individuals themselves, the external environment involving family and peers also affects the shaping process of students' educational expectations. The family plays a crucial role in students' education; an atmosphere that values education within the family can greatly motivate children to pursue higher academic achievements, and parents' attitudes and expectations towards education can even directly influence children's educational goals. Peer influence is also a factor that cannot be ignored; peers' behaviors and choices have a significant impact on an individual, especially if a group of a student's friends choose to drop out, which might lower their valuation of continuing education. Conversely, a positive peer group can significantly enhance students' educational expectations.

Additionally, the disparity in educational levels between urban and rural areas also has a significant impact on students' educational expectations. Urban schools typically offer a more diverse range of educational resources, including better teachers, facilities, and extracurricular activities, all of which can significantly enhance students' learning experiences and educational expectations. In contrast, due to the relative scarcity of resources, students' educational expectations in rural areas may be limited. This aspect is examined as a control variable in this study, allowing us to more accurately assess the impact of other factors on educational expectations.

The marginal contribution of this study lies in its in-depth analysis of China's specific social structure and educational system, especially in discussing the multidimensional factors affecting middle school students' educational expectations and choices of future residence. In existing literature, although the factors influencing educational expectations and choices of future residence are widely discussed, most studies focus on Western countries, and few deeply analyze a rapidly developing and educationally uneven country like China. This study uses a large-scale dataset from the China Education Panel Survey (CEPS) and considers multiple variables,

including students' cognitive abilities, health conditions, parental educational expectations, and peer influences, filling this research gap. Furthermore, by introducing school district as a moderating variable, this study explores how urban-rural differences affect students' educational expectations and choices of future residence. This approach not only enhances our understanding of how differences in educational resources and social environments affect different regions but also provides insights for educational policymakers on how to adjust strategies based on regional characteristics. The significant differences in educational expectations between urban and rural students may be related to the uneven distribution of educational resources and imbalanced community support systems. This analysis, represented by parents' educational expectations and peers' dropout situations, highlights the important role of the family environment and social relationships in shaping students' expectations, enriching the theoretical framework regarding educational choices and social mobility, and also suggests how practitioners might enhance educational outcomes through strengthening family support and optimizing the social environment.

2. Literature Review

2.1. Factors Influencing Students' Educational Expectations

Students' educational expectations are a key predictor of their academic achievements and socioeconomic success. Not only do students' educational expectations affect their academic paths, but they also have long-term effects on their career choices and future social status (Schoon & Eccles, 2014; Boxer et al., 2011). Internal conditions of students play a significant role in shaping their own educational expectations, with cognitive ability levels and health conditions being crucial indicators. Studies show that students with higher cognitive abilities usually set higher educational goals because they are more likely to succeed in academic tasks (Deary et al., 2007; Spinath et al., 2006). These experiences promote an increase in self-efficacy, thereby enhancing the pursuit of higher education levels (Guay et al., 2003). Health conditions also have a significant impact on students' educational expectations. Health issues, whether physical or psychological, can lead to interruptions in learning, affecting students' educational expectations (Basch, 2011; Currie, 2009). Good health supports students in maintaining active participation in school, thereby helping to sustain or enhance their educational expectations (Eisenberg et al., 2009). On the other hand, the external environment, consisting of peers and family, also affects students' educational expectations. Peers' academic achievements and behavioral patterns can significantly influence students' educational motivation and expectations through social comparison mechanisms (Wentzel, 1998; Ryan, 2001). Especially during adolescence, peers' influence may be more significant than family's (Kiuru et al., 2012). The family environment and parents' educational expectations play a key role in influencing students' educational expectations. Parents' support and expectations not only directly affect children's academic goals but also indirectly influence children's educational achievements through the family's educational resources and emotional support (Hill & Tyson, 2009; Jeynes, 2007). Family socioeconomic status has also been shown to be closely related to students' educational expectations (Sirin, 2005).

2.2. Educational Expectations and Future Residence Choices

Students' educational expectations are not only related to academic achievements but also affect their future choices of residence and work locations. Higher educational expectations often drive students to choose large cities or economically developed areas with more educational and career opportunities (Frenette, 2004; Ishitani, 2006). Additionally, such expectations may also encourage students to seek international educational and career paths, especially in today's increasingly globalized world (Brooks & Waters, 2009; Findlay et al., 2012).

2.3. Research Gaps and the Necessity of Study

While a substantial amount of research has explored the factors influencing students' educational expectations, such as cognitive abilities, health conditions, peer influences, and family background, there are still key research gaps. Most existing studies tend to examine the factors affecting students' educational expectations individually, with less exploration of possible interactions among these factors. For instance, how family background and peer influences jointly act on students' educational expectations remains unclear (Crosnoe et al., 2002; Pomerantz et al., 2007). This study aims to fill this gap by providing a more comprehensive understanding framework through an integrated analysis of multiple variables' interactive effects. The differences between urban and rural areas in China and the uneven distribution of educational resources may significantly affect students' educational expectations (Lu & Zhou, 2013). At the same time, research on how regional differences affect students' educational expectations is relatively limited, although existing literature suggests that educational expectations may influence individual geographical mobility. However, empirical studies on how students' educational expectations specifically affect their choices of future residence are still scarce. This study, based on the social background of China's rapid urbanization and using data covering multiple provinces and urban-rural areas from the China Education Panel Survey, explores the mechanisms by which students' educational expectations are formed under different regional backgrounds and analyzes the relationship between educational expectations and future residence choices. Understanding how educational expectations influence students' choices of future residence has significant practical significance and provides a new perspective on how education affects social mobility.

2.4. Research Hypotheses

To explore the mechanisms by which students' educational expectations are formed under different regional backgrounds and analyze the possible relationships between educational expectations and future residence, the following hypotheses are proposed:

Hypothesis 1

Cognitive abilities, health conditions, parents' educational expectations, and peer situations will have a joint effect on students' educational expectations or future residence.

Hypothesis 2

Schools located in different areas will moderate the impact of cognitive abilities, health conditions, peer situations, and parents' educational expectations on students' educational

expectations or future residence.

Using data from the China Education Panel Survey and linear regression models, the above hypotheses are tested to analyze the impact mechanisms of students' personal endowments and external constraints on their educational expectations under the imbalance of urban-rural educational resources.

3. Data and Results

3.1. Data Source

This study is based on data from the China Education Panel Survey (CEPS) designed and implemented by the National Survey Research Center (NSRC) at Renmin University of China. The aim is to deeply analyze the multidimensional factors affecting Chinese middle school students' educational expectations and future residence choices. The survey data covers 112 schools, 438 classes, and about 20,000 students' information, including data related to students, parents, teachers, and school leaders. This study selected some variables from the China Education Panel Survey (CEPS) to measure students' personal endowments, educational expectations, school districts, family environments, and social relationships. The selected variable data has undergone strict preprocessing and cleaning to ensure the accuracy and relevance of the analysis, adapting to the specific needs of this study.

The independent variables selected for the study mainly include cognitive abilities, health conditions, peer situations, and parents' educational expectations. Students' educational expectations and future residence choices are selected as dependent variables, and school districts are chosen as moderating variables, distinguished into urban and rural categories, to test the possible moderating effects of geographical location on other variables.

3.2. Definition of Core Variables

3.2.1. Student Cognitive Ability

Student cognitive ability is measured using the cognitive ability test scores from the China Education Panel Survey (CEPS) questionnaire. The data range is from 0 to 35, where 0 represents the weakest and 35 represents the strongest student cognitive ability. From low to high, this represents the spectrum from weak to strong cognitive abilities, with the cognitive ability test scores corresponding to the levels of student cognitive ability.

3.2.2. Health Condition

The health condition is measured using the student's self-assessment of their overall health condition from the China Education Panel Survey (CEPS). The questionnaire is set from 1 to 5 levels, corresponding to the student's self-assessment of their health condition, i.e., "1 represents very poor, 2 represents not very good, 3 represents average, 4 represents relatively good, 5 represents very good."

3.2.3. Peer Situation

Regarding the situation of friends, this paper pays detailed attention to the dropout situation of the student's surrounding friends and its impact. This data uses the original data from the China Education Panel Survey (CEPS). The levels are divided into three, from 1 to 3, representing from no such situations to many such situations, i.e., "1 represents none, 2 represents one to two such cases, 3 represents many such cases." The numerical value of the peer situation inversely corresponds to the quality of the student's peer situation.

3.2.4. Family Educational Expectations

We use the response from CEPS where parents answer "To what extent do parents hope the student will study?" to measure parental educational expectations. The original data is divided into 10 levels from low to high, respectively as "1 represents stopping now, 2 represents graduating from junior high, 3 represents vocational/technical school, 4 represents vocational high school, 5 represents ordinary high school, 6 represents university junior college, 7 represents university undergraduate, 8 represents graduate school, 9 represents PhD, 10 represents indifferent." To make the values more concentrated, this paper conducts a secondary classification, narrowing down the categories to 4, from low to high, respectively representing junior high, high school, university and above, indifferent.

3.2.5. Student Educational Expectations

We use the response from CEPS where students answer "To what extent do you hope to study in the future?" to measure students' educational expectations. The original data from the China Education Panel Survey (CEPS) is divided into 10 levels from low to high, respectively as "1 represents stopping now, 2 represents graduating from junior high, 3 represents vocational/technical school, 4 represents vocational high school, 5 represents ordinary high school, 6 represents university junior college, 7 represents university undergraduate, 8 represents graduate school, 9 represents PhD, 10 represents indifferent." Correspondingly, this paper conducts the same secondary classification method as for parental educational expectations, narrowing down the categories to 4. From low to high, these respectively represent junior high, high school, university junior college and above, indifferent.

3.2.6. Future Residence

We use the response from CEPS where students answer "Where do you hope to work and live in the future?" to measure future residence. The original data from the China Education Panel Survey (CEPS) is divided into 7 levels from low to high, respectively as "1 represents rural areas, 2 represents towns/counties, 3 represents small and medium-sized cities, 4 represents provincial capital cities, 5 represents Beijing/Shanghai/Guangzhou, 6 represents abroad, 7 represents indifferent." This paper conducts a secondary classification, narrowing down the categories to 3. From low to high, these respectively represent rural/small cities, developed cities, and indifferent, i.e., "1=rural, towns/counties, small and medium-sized cities, 2=provincial capitals, Beijing/Shanghai/Guangzhou, abroad, 3=indifferent."

3.2.7. School District

The school district represents the regional type of the student's school, measured using the original data from the China Education Panel Survey (CEPS). It is divided into 5 levels from low to high, respectively from urban center to rural, i.e., "1 represents the central urban area of the city/county, 2 represents the peripheral urban area of the city/county, 3 represents the urban-rural junction of the city/county, 4 represents towns outside the city/county, 5 represents rural areas." This paper conducts secondary processing of this data and reverses the order. After adjustment, the data is divided into two categories, rural and urban, i.e., "1=rural, towns outside the city/county, 2=the central urban area of the city/county, the peripheral urban area of the city/county, the urban-rural junction of the city/county."

The moderating variables obtained by multiplying cognitive abilities, health conditions, peer situations, and parental educational expectations with the school district are used to distinguish between urban and rural categories, testing the possible moderating effects of geographical location on other variables.

3.3. Descriptive Statistics

Table 1 shows the descriptive statistics for key variables such as cognitive ability, health condition, friend situation, parental educational expectations, and student educational expectations among the sample students. From the cognitive ability indicator, the average cognitive ability test score among the survey sample is 21.07 points, with a median of 23 points, reflecting a generally good level of cognitive ability across the sample. The highest score can reach 35 points, the lowest is 0 points, and the standard deviation is 8.969, indicating that there is some variation in cognitive ability among students, and there are also some weaker students. In terms of health condition, the average score is 3.85, the median is 4 points, and the standard deviation is 0.939, indicating that most students rate their health condition as relatively good. The average value of the friend situation indicator is 1.09, the median is 1, and the data distribution is concentrated between 1 and 3, with a relatively small standard deviation of 0.330, indicating that most students do not have situations of good friends dropping out. Overall, the sample students are generally good in terms of cognitive ability, health condition, and social relationships, providing an ideal basis for subsequent research on student development.

Table 1. Descriptive Statistics for Main Variables

Variable	Average	Median	Standard Deviation	Minimum	Maximum
Cognitive	21.07	23.00	8.969	0	35
Health	3.85	4.00	.939	1	5
Friends	1.09	1.00	.330	1	3
Parental Expectations	2.8087	3.0000	.51710	1.00	3.00
Student Expectations	2.8162	3.0000	.59853	1.00	4.00
Residence	1.9938	2.0000	.51696	1.00	3.00
School District	1.6573	2.0000	.47465	1.00	2.00

3.4. Empirical Model

Based on the content of the empirical hypotheses and the type of data, an empirical model is established to test the hypotheses, and control variables and moderating variables are set to increase the model's reliability.

$$Outcome_i = \beta_0 + \beta_i input_j + \beta_2 controls + \varepsilon_{ij} \quad (1)$$

Where the dependent variable $Outcome_i$ represents students' educational expectations and future living and working locations, the variable combination $input_j$consists of cognitive abilities, health conditions, friend situations (dropout), and parental educational expectations, and Controls represent the school district. β_0,β_i, $\beta_2$represent the corresponding regression coefficients, and$\varepsilon_{ij}$is the error term.

$$Outcome_i = \beta_0 + \beta_i input_j + \beta_2 Moderate + \varepsilon_{ij} \quad (2)$$

Here, the dependent variable $Outcome_i$ again represents students′ educational expectations and future living and working locations. The variable combination $input_j$includes cognitive abilities, health conditions, peer situations, and parental educational expectations. The moderating variable Moderate represents the product of the school district and the corresponding variables of cognitive abilities, health conditions, peer situations, and parental educational expectations. β_0, β_i, $\beta_2$represent the regression coefficients, and $\varepsilon_{ij}$is the error term.

4. Empirical Analysis

4.1. Basic Regression Results

4.1.1. Student Educational Expectations

With the school district as the control variable, and students' educational expectations as the dependent variable, cognitive abilities, health conditions, friends' dropout situations, and parental educational expectations are included as independent variables in the regression. The corresponding regression coefficients are shown in Table 2 (1)-(5).

According to Table 2, controlling for school district, cognitive abilities, health conditions, friends' conditions, and parental educational expectations all have a significant impact on students' educational expectations ($p<0.05$). Specifically, the stronger a student's cognitive abilities, the higher their own educational expectations. Holding other variables constant, each unit increase in cognitive abilities increases students' educational expectations by 0.011; students with better health conditions have higher educational expectations, with each unit increase in health condition raising educational expectations by 0.014; higher parental expectations also correlate with higher student educational expectations, with each unit increase raising educational expectations by 0.495; the influence coefficient for friends' dropout situations is -0.200, indicating that the dropout situations of friends around the student negatively impact their own educational expectations, with each unit worsening of the situation, especially dropout, reducing educational expectations by 0.200; the area of the school (urban-rural differences) also significantly affects students' educational expectations, with the impact coefficient for urban-rural differences on educational expectations being 0.166, suggesting that being in an urban school area increases students' expectations for their own future development compared to rural areas.

Table 2. Relationships between Student Educational Expectations and Various Independent Variables (without moderating variables involved)

Variable	Student Expectation							
Cognitive	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Health		0.011*** (0.001)				0.011*** (0.001)		0.006*** (0.001)
Friends			0.014** (0.025)			0.011* (0.064)		0.005 (0.319)
Parental Expectations				-0.200*** (0.001)			-0.118*** (0.001)	-0.106*** (0.001)
Student Expectations					0.495*** (0.001)		0.486*** (0.001)	0.466*** (0.001)
Residence	0.166*** (0.001)	0.13*** (0.001)	0.165*** (0.001)	0.158*** (0.001)	0.095*** (0.001)	0.129*** (0.001)	0.091*** (0.001)	0.075*** (0.001)
Constant	2.541*** (0.001)	2.364*** (0.001)	2.490*** (0.001)	2.772*** (0.001)	1.270*** (0.001)	2.323*** (0.001)	1.428*** (0.001)	1.356*** (0.001)
Adj-R2	0.019	0.049	0.019	0.031	0.195	0.049	0.199	0.206

Note: Parentheses contain the standard deviations of the corresponding regression coefficients, Adj-R^2 indicates the fitting effect of the corresponding model.

*** $p<0.01$,

** $0.01<p\leq0.05$,

*$0.05<p\leq 0.10$

Combining the above variables, cognitive abilities and health conditions are regarded as internal factors, and friends' situations and parental educational expectations as environmental influences, separate regressions are conducted. The regression equation based on the school district as the control variable and internal and external factors as independent variables shows corresponding regression coefficients in Table 2 (6)-(8). Internally, the impact coefficients of cognitive abilities and health conditions on students' educational expectations are 0.011 ($p<0.001$) and 0.011 ($p<0.001$), respectively, showing that, controlling for other factors, both health conditions and cognitive abilities have a positive correlation with students' development expectations. Externally, the impact coefficients of friends' situations and parental educational expectations on students' educational expectations are -0.118 ($p<0.001$) and 0.486 ($p<0.001$), respectively, indicating that parental education and friends' situations have opposite effects on students' educational expectations. Parental educational expectations positively influence students' educational expectations, increasing by 0.486 per unit increase, holding other variables constant. Friends' dropout situations negatively affect students' educational expectations, reducing them by 0.118 for each unit increase.

The regression results combining the four factors indicate that in the regression equation, the coefficient for parental educational expectations is 0.466 ($p<0.001$), friends' dropout is -0.106 ($p<0.001$), cognitive abilities are 0.006 ($p<0.01$), and health conditions are 0.005 ($p>0.1$). At a significance level less than 0.01, it is considered that parental educational expectations, friends' dropout, and cognitive abilities significantly impact students' educational expectations, with parental educational expectations and cognitive abilities having positive impacts, while friends' dropout has a negative impact.

4.1.2. Future Residence

With the school district as the control variable, and students' desired future residence as the dependent variable, cognitive abilities, health conditions, friends' dropout situations, and parental educational expectations are included as independent variables in the regression. The corresponding regression coefficients are shown in Table 3 (1)-(5).

According to Table 3, controlling for school district, cognitive abilities, and parental educational expectations both have significant impacts on students' educational expectations ($p<0.01$). Specifically, the stronger a student's cognitive abilities, the higher their own expectations for future residence, with each unit increase in cognitive abilities raising future residence expectations by 0.002. Parental educational expectations have a significant positive impact on future residence expectations, with higher parental expectations correlating with higher student expectations for future residence, increasing by 0.036 for each unit increase. The impacts of health conditions and friends' situations on students' future residence expectations are not significant ($p>0.01$). The area of the school (urban-rural differences) also significantly impacts students' future residence expectations, with the impact coefficient for urban-rural differences being 0.102, reaching a significant level, indicating that the characteristics of the school's location have an important impact on students' development expectations.

Combining the above variables, cognitive abilities and health conditions are considered internal factors, and friends' situations and parental educational expectations as environmental influences, separate regressions are conducted. The regression equation based on the school district as the control variable and internal and external factors as independent variables shows corresponding regression coefficients in Table 3 (6)-(8). In the internal factors model (6), the impact coefficients for cognitive abilities and health conditions on future residence expectations are 0.002 ($p<0.001$) and -0.001 ($p>0.1$), respectively, indicating that,

controlling for other factors, compared to health conditions, cognitive abilities have a more significant impact on future residence. In the external factors model (7), the impact coefficients for friends' situations and parental educational expectations on future residence expectations are 0.008 ($p>0.1$) and 0.036 ($p<0.001$), respectively, indicating that, controlling for other factors, compared to friends' situations, parental educational expectations have a more significant impact on future residence. Overall, the impact coefficients for the four factors on future residence expectations are as follows: parental educational expectations (0.030, $p<0.01$), cognitive abilities (0.002, $p<0.01$), friends' dropout (0.012, $p>0.1$), and health conditions (-0.002, $p>0.1$). In terms of the relative impact of each factor, parental educational expectations have the most significant effect, followed by cognitive abilities, then friends' situations, with the impact of health conditions being relatively less noticeable. This provides important evidence for understanding the key factors affecting student development.

Table 3. Relationships between Future Residence and Various Independent Variables (without moderating variables involved)

Variable	Future Residence							
Cognitive	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Health		0.002***				0.002***		0.002***
		(0.001)				(0.001)		(0.001)
Friends			-0.001			-0.001		-0.002
			(0.882)			(0.809)		(0.776)
Parental Expectations				0.008			0.008	0.012
				(0.904)			(0.602)	(0.444)
Student Expectations					0.036***		0.036***	0.030***
					(0.001)		(0.001)	(0.003)
Residence	0.102***	0.095***	0.102***	0.102***	0.097***	0.095***	0.097***	0.092***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	1.825***	1.791***	1.828***	1.822***	1.733***	1.796***	1.723***	1.711***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj-R^2	0.009	0.011	0.009	0.009	0.010	0.011	0.010	0.011

Note: Parentheses contain the standard deviations of the corresponding regression coefficients, Adj-R^2 indicates the fitting effect of the corresponding model.

*** $p<0.01$,

** $0.01<p\leq0.05$,

*$0.05<p\leq 0.10$

The regression analysis results in Table 3 show that students' choices of future residence are related to multiple factors. Firstly, the stronger a student's cognitive abilities, the more likely they are to choose large, developed cities as their future residence. This may be because large cities offer better development opportunities and a higher quality of life, attracting those with stronger cognitive abilities. Secondly, the better a student's health condition, the more likely they are to choose large, developed cities. Students with better health conditions may have stronger adaptability to life, allowing them to live and work in large cities. Additionally, if there are many friends dropping out around the student, they are more likely to choose rural or small cities as their future residence. This may be because, in these relatively safe and familiar environments, students are unwilling to face the competitive pressures of large cities. Lastly, parents' educational expectations also affect students' choices, with higher parental expectations leading students to prefer large, developed cities. This may be because parents' expectations influence students' development plans, prompting them to pursue a better living environment. In summary, students' cognitive abilities, health conditions, the dropout situations of friends around them, and parental educational expectations are all important factors affecting their future residence choices.

4.2. Regression Results with Moderating Variables

4.2.1. Student Educational Expectations

With the school district as the control variable, and students' educational expectations as the dependent variable, cognitive abilities, health conditions, friends' dropout situations, and parental educational expectations are included as independent variables, with moderating variables multiplied by the aforementioned four independent variables included in the regression. The corresponding regression coefficients are shown in Table 4 (1)-(5).

According to Table 4, controlling for school district, and adding school district as a moderating variable, cognitive abilities, health conditions, friends' situations, and parental educational expectations still have significant impacts on students' educational expectations ($p<0.01$). Specifically, compared to rural areas, being in an urban school increases the impact of cognitive abilities by an additional 0.005. Health conditions have a significant negative impact on students' educational expectations, with each unit increase reducing educational expectations by 0.060, and the moderating variable shows that compared to rural areas, the negative impact of health in urban areas decreases by 0.045. Friends' dropout situations have a significant negative impact on students' educational expectations, with each unit increase reducing educational expectations by 0.424, and the

moderating variable shows that compared to rural areas, the impact of friends in urban areas increases by an additional 0.145. Parental educational expectations have a significant positive impact on students' educational expectations, with each unit increase raising educational expectations by 0.452. Compared to rural areas, the impact of parents in urban schools increases by an additional 0.030.

Table 4. Relationships between Student Educational Expectations and Various Independent Variables (with moderating variables involved)

Variable	Student Expectation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cognitive		0.003***				0.019***		0.005**
		(0.008)				(0.001)		(0.037)
Health			-0.060***			-0.089***		-0.050***
			(0.001)			(0.001)		(0.001)
Friends				-0.424***			-0.281***	-0.198***
				(0.001)			(0.001)	(0.001)
Parental Expectation					0.452***		0.502***	0.533***
					(0.001)		(0.001)	(0.001)
District*Cognitive		0.005***				-0.004***		0.001
		(0.001)				(0.001)		(0.741)
District*Health			0.045***			0.061***		0.034***
			(0.001)			(0.001)		(0.001)
District*Friends				0.145***			0.105***	0.060**
				(0.001)			(0.001)	(0.014)
District*Parental Expectation					0.030***		-0.010	-0.047***
					(0.001)		(0.277)	(0.001)
School District	0.166***							
	(0.001)							
Constant	2.541***	2.567***	2.757***	3.016***	1.405***	2.527***	1.572***	1.492***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj-R^2	0.019	0.046	0.020	0.031	0.193	0.052	0.199	0.208

Note: Parentheses contain the standard deviations of the corresponding regression coefficients, Adj-R^2 indicates the fitting effect of the corresponding model.

*** $p<0.01$,

** $0.01<p\leq0.05$,

*$0.05<p\leq 0.10$

Combining the above variables, cognitive abilities and health conditions are considered internal factors, and friends' situations and parental educational expectations as environmental influences, separate regressions are conducted. The regression equation based on the school district as the control variable and internal and external factors as independent variables shows corresponding regression coefficients in Table 4 (6)-(8). For internal factors, the impact coefficients for cognitive abilities and health conditions on students' educational expectations are 0.019 ($p<0.001$) and -0.089 ($p<0.001$), respectively. This shows that, controlling for other factors, the impact of cognitive abilities on students' educational expectations contrasts with the impact of health conditions, with the impact of cognition in urban areas additionally decreasing by 0.004 and the impact of health additionally increasing by 0.061. For external factors, the impact coefficients for friends' situations and parental educational expectations on students' educational expectations are -0.281 ($p<0.001$) and 0.502 ($p<0.001$), respectively. This shows that, controlling for other factors, the impact of parental educational expectations contrasts with the impact of friends' situations, with the impact of parental education in urban areas additionally decreasing by 0.010 and the impact of friends' situations additionally increasing by 0.105.

The regression results combining the four factors indicate that these factors' impact coefficients on students' educational expectations are as follows: parental educational expectations (0.030, $p<0.01$), friends' dropout (-0.198, $p<0.01$), health conditions (-0.050, $p<0.01$), cognitive abilities (0.005, $p<0.05$). Compared to rural areas, in urban areas, the impact of cognition additionally increases by 0.001. The impact of health additionally increases by 0.034. The impact of parental educational expectations additionally decreases by 0.047. The impact of friends' situations additionally increases by 0.060. In terms of the relative impact of each factor, parental educational expectations have the most significant effect, followed by friends' dropout, then health conditions, with the impact of cognitive abilities being relatively less noticeable. This provides important evidence for understanding the key

factors affecting student development.

4.2.2. Future Residence

With the school district as the control variable, and future residence as the dependent variable, cognitive abilities, health conditions, friends' dropout situations, and parental educational expectations are included as independent variables, with moderating variables multiplied by the aforementioned four independent variables included in the regression. The corresponding regression coefficients are shown in Table 5 (1)-(5).

Table 5. Relationships between Future Residence and Various Independent Variables (with moderating variables involved)

Variable	Future Residence							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cognitive		-0.005***				-0.004**		-0.002***
		(0.001)				(0.028)		(0.001)
Health			-0.043***			-0.006		0.009
			(0.001)			(0.589)		(0.545)
Friends				-0.134***			0.016	0.024
				(0.001)			(0.666)	(0.542)
Parental Expectation					-0.022*		-0.024	-0.014
					(0.078)		(0.156)	(0.520)
District*Cognitive		0.004***				0.004***		0.002*
		(0.001)				(0.001)		(0.081)
District*Health			0.026***			0.003		-0.007
			(0.001)			(0.630)		(0.431)
District*Friends				0.087***			-0.005	-0.008
				(0.001)			(0.808)	(0.741)
District*Parental Expectation					0.038***		0.040***	0.029**
					(0.001)		(0.001)	(0.022)
School District	0.102***							
	(0.001)							
Constant	1.825***	1.941***	1.993***	1.982***	1.875***	1.946***	1.865***	1.846***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj-R2	0.009	0.012	0.009	0.008	0.011	0.011	0.011	0.012

Note: Parentheses contain the standard deviations of the corresponding regression coefficients, Adj-R^2 indicates the fitting effect of the corresponding model.

*** $p<0.01$,

** $0.01<p\leq0.05$,

*$0.05<p\leq 0.10$

According to Table 5, controlling for school district, and adding school district as a moderating variable, cognitive abilities, health conditions, friends' situations, and parental educational expectations still have significant impacts on future residence ($p<0.1$). Specifically, cognitive abilities have a significant negative impact on future residence, with each unit increase reducing future residence by 0.005, and the moderating variable shows that compared to rural areas, the impact of cognition in urban areas additionally increases by 0.004. Health conditions have a significant negative impact on future residence, with each unit increase reducing future residence by 0.026, and the moderating variable shows that compared to rural areas, the negative impact of health in urban areas decreases by 0.045. Friends' dropout situations have a significant negative impact on future residence, with each unit increase reducing future residence by 0.134, and the moderating variable shows that compared to rural areas, the impact of friends in urban areas additionally increases by 0.087. Parental educational expectations have a significant negative impact on future residence, with each unit increase reducing future residence by 0.022, and the moderating variable shows that compared to rural areas, the impact of parents in urban areas additionally increases by 0.038.

Combining the above variables, cognitive abilities and health conditions are considered internal factors, and friends' situations and parental educational expectations as environmental influences, separate regressions are conducted. The regression equation based on the school district as the control variable and internal and external factors as independent variables shows corresponding regression coefficients in Table 5 (6)-(8). The impact coefficients for cognitive abilities and health conditions on future residence are -0.004 ($p<0.05$) and -0.006 ($p>0.1$), respectively. Controlling for other factors, the impact of cognitive abilities on future residence remains higher than that of health conditions. Compared to rural areas, the impact of cognition in urban schools on future residence additionally increases by 0.004, and the impact of health on future residence additionally increases by 0.003. The impact coefficients for friends' situations and parental educational expectations on

future residence are 0.016 ($p>0.1$) and -0.024 ($p>0.1$), respectively. This shows that the external environment has a less significant impact on students' choices of future residence, with only the impact of parental educational expectations under urban-rural differences being significant. Compared to rural areas, the impact of parental education in urban areas additionally decreases by 0.040.

The regression results combining the four factors indicate that the impact coefficients for the four variables on future residence are as follows: cognitive abilities (0.030, $p<0.01$), parental educational expectations (-0.198, $p<0.01$), friends' situations (-0.050, $p<0.01$), health conditions (0.005, $p<0.05$). In terms of the relative impact of each factor, cognitive abilities have the most significant effect, followed by parental educational expectations, then friends' situations, with the impact of health conditions becoming relatively less noticeable. This provides important evidence for understanding the key factors affecting student development. Additionally, compared to rural areas, in urban schools, the impact of cognition on future residence decreases by 0.002, the impact of health on future residence increases by 0.009, the impact of parental educational expectations decreases by 0.014, and the impact of friends' situations increases by 0.024.

5. Conclusion

This study, using data from the China Education Panel Survey (CEPS), delves into the multidimensional factors affecting Chinese middle school students' educational expectations and their choices of future residence. The analysis shows that students' cognitive abilities, health conditions, parental educational expectations, and peers' dropout situations all significantly impact students' educational expectations. Specifically, cognitive abilities and parental educational expectations have positive effects in enhancing students' educational expectations, highlighting the important roles of family background and personal abilities in educational achievements. Conversely, peers' dropout situations exhibit a negative impact, suggesting that a negative social environment may suppress students' educational aspirations. In terms of choices for future residence, the data similarly emphasize the importance of parental educational expectations and students' personal cognitive abilities, where higher parental expectations and stronger cognitive abilities encourage students to opt for settling in more developed cities or abroad, reflecting the close connection between educational expectations and globalized life choices. These findings not only reveal the roles of family and personal factors in educational and life decisions but also emphasize how educational expectations translate into specific geographical and career positioning decisions.

This study integrates multiple factors such as personal cognitive abilities, health conditions, family environment, and social interactions, providing a detailed analytical framework that deepens our understanding of the mechanisms behind the formation of educational expectations. Additionally, by exploring how urban-rural differences moderate the effects of these factors, this paper further enriches discussions related to educational equity and resource distribution, offering important empirical evidence for educational policy and practice. Although this study offers meaningful insights, it has some limitations. Firstly, although the dataset is extensive, it is primarily quantitative data, which may not fully capture the cultural and psychological factors affecting students' educational expectations and life choices. Secondly, although the study attempts to control for various potential confounding variables, there may still be some unobserved variables that could affect the interpretation of the results. This study primarily uses data from the China Education Panel Survey (CEPS), so the geographical limitations of the research are mainly concentrated in China's provinces, cities, and rural areas. Additionally, since the data collection was completed during a specific time period, the results may primarily reflect the educational and social conditions at that point or period and may not fully represent other time periods or trends.

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