

The Influence of Peer Relationship on Middle School Students' Education

—CEPS Data Based on 2013-2014 Baseline

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Abstract

This paper uses data from the China Education Tracking Survey (CEPS) to explore the impact of peer relationships on the academic performance of students in the ninth grade. First, according to the number of migrants in the area, the sample is divided into three groups, namely, Shanghai, a region with a large number of floating population and a national core sample formed in other parts of the country. Then, the local students in each sample group are grouped with the foreign students, and the impact of peer relationship on their academic performance is analyzed respectively by regression analysis. Then the differences among the groups are compared. Finally, the sample is limited to the sample of students in the rural household registration system. Parent-child relationship is added to control the influence of the family environment and a robustness test is conducted. Through these empirical studies, we find: 1) There are differences in the impact of peer relationships on academic performance in different regions. In the Shanghai sample, there is no significant correlation between peer relationship and academic achievement; in regions with a large number of floating population, the quality of peer impact on academic performance is greater than that of national core sample with fewer floating population. 2) The impact of peer relations on students in different regions in China and foreign countries is different. In areas with a large number of floating population, peer relationships significantly affect the academic performance of overseas students. In the national core sample, peer relationships significantly affect the academic performance of local students, with no significant impact on foreign students. 3) There are differences in the impact of peer relations on Chinese and mathematics. Among them, the least impact on the language proficiency. 4) There is a significant positive correlation between student evaluation of peer relationships and academic achievement. The impact of communication frequency on academic performance may be poor.

Keywords

Peer Relations, Academic Achievement, Relocation Children, Teaching Theory

1. Introduction

With the rapid development of industrialization and urbanization in our country, the migration of Chinese migrants has entered the most active period. With the increase of floating population, the number of accompanying children aged from 0 to 17 in our country is increasing every year. According to “China Mobile Children Data Report (2014)” shows that as of November 1, 2010 the 6th national census, the number of children of migrant workers in our country has reached 35.81 million. As of September 2009, the problem of enrollment near the stage of compulsory education for children in Shanghai in the area has basically been resolved. We should not only make migrant children of migrant workers have the opportunity to enjoy the same educational conditions as those of urban children, and create a fair and harmonious social environment, a school environment and a family environment for them so that they will enjoy genuine education in fairness. We should also pay close attention to the academic and comprehensive qualities that local students will be subjected to. This will enable both local students and their children to have fair and appropriate education.

Since the implementation of the new curriculum reform, substantial changes have taken place in teaching ideas (from teachers to students); traditional classroom education formal teaching brings the inefficient teaching and the present situation of the students’ passive learning. The new curriculum reform advocates students and their learning as the center of the teaching practice paradigm; teachers create various conditions and use a variety of teaching methods to realize students’ autonomous learning and responsible learning. Peer relationship refers to a common activity and mutual cooperation between children of the same or similar age, or mainly refers to a kind of interpersonal relationship established and developed during the process of interaction between individuals of the same age or with similar levels of psychological development [1]. Before entering adolescence, children spend most of their time in the family. The main object of interaction with children is the parents. Junior high school students are in early adolescence. Their physical and mental development is rapid and their inner world is getting richer. In their personality, they have a strong desire to get rid of the shackles of adults and their pursuit of independence. At this time, they have more and more interactions and interactions with their peers, and their peer relationships have become increasingly closer. The influence of peers on junior high school students has gradually caught up to even more than the influence of families. Peer theory and empirical research have shown that peers are an important source of children’s social development and an important influen-

cing factor for children's self-concept and healthy personality formation [2]. In class education, it is worth the teacher's attention to guide students to form a good peer relationship.

2. Literature Review

Beginning with the research on peer relations from the 30s to the 40s of the 20th century and the transition from the 1970s to the present, the research on children's peer relations and social development has been rapidly rising and flourishing. Bukatko and Daehler define peer relationships as the interaction of children of the same or similar age [3]. Hartup proposed the concepts of vertical relations and horizontal relations in 1989 when children interacted with each other during their growth [4]. Vertical relationship refers to the relationship between children and elders, including parent-child relationship and teacher-student relationship. Horizontal relationship means that most of the people contacted by children are groups with similar social cognition. Children entering school age gradually have a greater proportion of their peers in the horizontal relationship. The vertical relationship between the parent-child relationship and the teacher-student relationship has been correspondingly reduced. In 1996, Coleman *et al.* Proposed that companions have an important impact on students. Sullivan (H.S) emphasizes that peer relationships in adolescence are of great importance to their formation of healthy self-awareness and development. Winston and Zimmerman point out that personal behavior is influenced by its interaction with others, and there is a companion effect in this process [5]. Zimmer and Toma argue that the characteristics of students at school and in class have a companion effect on student achievement [6]. Patrick [7] and McEwan, using data from Chile's 1997 grade 8 student performance survey, estimated the impact of peers on student achievement [8].

China's study of peer relationships among children began in the mid-1980s and early 1990s. At present, the research in this field mainly focuses on the basic situation of the peer relationship and the related research with other related variables. The involved variables include academic achievement, self-concept and social behavior. In the basic situation of companionship, there are differences between boys and girls in the peer relationship. Huang Yufen and Li Wei-jian (2010) [9] concluded from the questionnaire survey that the peer relationships of girls were better than boys and they are better than boys in peer assessment. Wu Xiaotong, Zhou Ning *et al.* (2011) [10] found that the proportion of popular groups for girls was higher than that of boys. Chen Chengchao (2011) [11] that girls are more likely to be accepted by peers than boys, and their relationship quality is higher than that of boys. The researchers of Wang Jianing and Yu Wei *et al.* (2009) [12] believe that boys had better peer relationships than girls. In addition, WoJianzhong, Lin Chongde, *et al.* (2001) [13] found that compared with high school students, junior high school students' peer interaction changes greatly, not as high school students as stable. QuWeiguo (2000) [14] studied the

junior high school students' choice of peers. In the study of peer relations and related variables, Liu Zhijun and Wang Yan (2008) [15] conducted a study on parent-child communication and peer relationship, teacher-student relationship and peer relationship, and concluded that peer relationships are more independent. The research of Huang Yufen and Li Weijian (2010) showed that junior high school students' peer relationships significantly affected the development of students' self-concept. Yang Dehua (2001) [16] studied the relationship between junior middle school students' peer relationship and anxiety status. The research of ZhengYangxuan and Fang Ping (2009) [17] showed that there were differences in the adjustment strategies adopted by different peer groups. Yang Haibo (2008) [18] found that the relationship between peers in the lower grades (grade two and grade three) had no effect on the academic performance basically through the research on the relationship between the pupils and their academic achievements. By the fourth grade, the effect of peer relations on academic performance gradually promotes.

Although the above research has studied the effect of peer relationship from all aspects, most of the research only makes a qualitative analysis, and the quantitative analysis of the research sample is more limited. It doesn't distinguish the different characteristics of the region, either. Few people analyze and discuss the impact of peer relationships on different student groups based on the phenomenon of more floating children. The study of this article is more detailed. Based on the sample of the whole country, we will discuss the influence of peer relationship on the students in this area according to the number of migrant children in different regions. Relevant variables include language proficiency and math scores. By studying the different regions and overseas students separately, the impact of peer relationship among different types of student groups can be more clearly shown, which can provide the basis for the improvement of school education system.

3. Data and Descriptive Analysis

The data in this paper is based on the China Education Tracking Survey (CEPS), which uses the 2013-2014 school year as the baseline. The survey uses the population average education level and the proportion of floating population as stratum variables to extract 28 county-level units from across the country as survey sites. Using the sampling method with proportional probabilities and scales in stages, 112 schools and 438 classes are randomly selected from the selected county-level units to conduct surveys. The students in the class are all enrolled. The data included 19,487 samples. This paper uses data from ninth graders in public schools to integrate student data with school data and delete samples with missing values for a total of 7233 samples, including 1049 for migrant children and 6184 for local students, covering the public 104 schools.

In order to compare the differences among students in different regions, this paper divides the samples into three categories: sample 1 is the national core

sample, sample 2 is Shanghai sample, and sample 3 is the typical sample of floating population in China. Sample 1 contains 4315 samples from 15 counties (districts) drawn from all 2870 counties (districts) in the country (except Shanghai and counties (districts) with large floating population across the country); Shanghai has a large city with its As a special case, the sample size is 484, covering 3 counties (districts). 2 counties (districts) are taken from all the counties (districts) in Shanghai, and 1 county (district) with large numbers of floating population were sampled; sample 3 was drawn from 10 counties (districts) out of 120 counties (districts) with a large number of floating population in the country with a sample size of 2434.

Language scores and math scores are the standardized scores of mid-term examinations in 2013 (original grades provided by the schools, calculated by school and grade respectively, and adjusted to a mean of 70 and a standard deviation of 10 scores) The measurement method of (2016) [19] is reflected in the frequency and relationship evaluation of the two indicators. The frequency of communication problems is: The frequency of doing the following things yourself or with your classmates is probably—visit the museum, go to the zoo, science and technology museums, go out to watch movies, performances, sports competitions, the problem using the five point scale (never once a year, once every six months, once a month, once a month or more), that is, the value never done before is 1, the value once every year is 2, the value once every 6 months is 3, and each month Value of 4, once a month or more value of 5, these two questions will be added together to obtain the frequency of the original score points. Relationship evaluation is based on individual perception of the quality of the relationship to start measuring, the specific problem is: Most students in my class are very friendly to me; I often participate in the activities of the school or class organization; I feel easy to get along; I am the people in this school Feel very close; the problem using the four-point scale (fully agree, disagree, agree, fully agree), the four questions are added together to score the original evaluation score. Due to the different scales, converted to Z scores, and then analyzed. The characteristics of the students include their ethnicity, gender, whether they are only children or not, and they are included in the analysis as dummy variables. The family characteristics include the education background of their parents (divided into 9 educational levels, no education, primary school, junior high school, technical secondary school, technical school, vocational high school, college, undergraduate, postgraduate and above, with a score of 1 - 9), family economic conditions (five levels, very difficult, difficult, medium, relatively affluent, very affluent, scores of 1 - 5) included as metrics The school characteristics include the rankings of the schools in the county (district) (five categories, from 1 - 5), the proportion of students in the county district; the county (district) characteristics are the average years of education in the district. The following county (area) refers to as local, outside the county (area) referred to as the field.

We divide the sample into separate groups, group A is the national core sample of sample 1, a1 is a local student, the sample size is 3933, a2 is a foreign student, and the sample size is 382. Group B is Sample 2 Shanghai Sample, b1 is a local student, sample size is 367, b2 is a foreign student, sample size is 117. Group C is sample 3 of sample with a large number of floating population, c1 is a local student with a sample size of 1884, c2 is a foreign student, and the sample size is 550. **Table 1** shows the mean and standard deviation of the six groups of variables.

Judging from the standardized scores of test scores, the average score of mathematics for foreign students in the national core sample of group A is slightly higher, which is 70.89 points, and that of local students is slightly higher, which is 70.38 points. In the sample of Group B Shanghai, the average scores of foreign students in language and mathematics are slightly higher than those of local students, which are 71.87 and 70.63 respectively. In group C, the country's more mobile counties (districts), the average score of foreign language students is slightly higher than that of local students, which is 71.34 points. The local students have slight advantage in mathematics and scored 70.26. Comparing the results of the three groups of foreign students, the Chinese in group B has the highest average scores, and the math scores are slightly lower than in group A. Comparing the scores of the three groups of local students, B's average math score is the highest, which is 70.49 points, and its language score is slightly lower than that of group A. This reflects the characteristics of Shanghai as an extra-large city. Its economic development level is relatively high. Corresponding education systems and facilities are more scientific. Floating population may have problems of choice in the region. Whether to arrange their children to study abroad Consideration may be concerned about the child's academic performance. Children attending children's math scores need further attention.

The measure of peer relationship includes the frequency of interaction between foreign students and local students and the evaluation of their relationship. Confidence test on the two questionnaire data involved in the frequency of interaction cronbach's $\alpha = 0.7158$, greater than 0.6, believed to be more credible and could be used for analysis. The reliability of cronbach's $\alpha = 0.7794$ is tested on the data of the four questionnaires involved in the evaluation of the relationship. The reliability is high and can be used for analysis. In the frequency of communication, the scores of foreign students in group B are 0.43, the highest scores in three groups, nearly double the scores of similar students in group C, the lowest in group A, and the scores in group B are significantly different from those in group B, and the scores are -0.10 . In relational evaluation, the average scores of the two groups of students in group B are the highest, the local students score 0.16 and the scores of foreign students 0.33, respectively, which are 0.08 and 0.23 higher than those of group C respectively, which are 0.21 and 0.41 higher than that of group A respectively. Among the two types of indicators, B is the highest among foreign students and the lowest is in A.

Table 1. Descriptive analysis of variables.

	A/national core sample		B/Shanghai		C/Floating population area	
	a1/Native	a2/Outsiders	b1/Native	b2/Outsiders	c1/Native	c2/Outsiders
Language achievement	70.38 (9.80)	71.31 (9.17)	70.32 (9.07)	71.87 (9.72)	70.22 (9.90)	71.34 (9.00)
Mathematical achievement	70.27 (9.89)	70.89 (9.30)	70.49 (9.67)	70.63 (8.82)	70.26 (9.92)	71.17 (9.02)
Communication frequency	-0.29 (0.88)	-0.10 (0.97)	0.39 (0.77)	0.43 (0.77)	0.43 (0.91)	0.22 (0.92)
Relationship evaluation	-0.05 (0.94)	-0.08 (0.93)	0.16 (0.95)	0.33 (0.87)	0.08 (1.01)	0.1 (0.93)
Minority#	0.09 (0.29)	0.06 (0.24)	0.01 (0.09)	0.06 (0.24)	0.04 (0.20)	0.07 (0.25)
Male#	0.48 (0.50)	0.51 (0.50)	0.49 (0.50)	0.44 (0.50)	0.48 (0.50)	0.48 (0.50)
Only child#	0.35 (0.48)	0.31 (0.46)	0.87 (0.33)	0.53 (0.50)	0.7 (0.46)	0.35 (0.48)
Mother education level	3.42 (1.74)	3.30 (1.68)	5.34 (2.06)	4.93 (2.30)	4.64 (2.13)	3.54 (1.82)
Father education level	3.78 (1.79)	3.73 (1.71)	5.57 (2.02)	5.22 (2.14)	4.96 (2.18)	4 (1.90)
Family economic conditions	2.87 (0.54)	2.95 (0.49)	3.2 (0.50)	3.27 (0.50)	3.11 (0.51)	3.08 (0.42)
School rankings	3.97 (0.75)	3.93 (0.77)	3.96 (0.50)	3.89 (0.54)	4.06 (0.93)	3.56 (0.98)
Local student ratio	0.93 (0.10)	0.76 (0.19)	0.68 (0.15)	0.61 (0.11)	0.78 (0.14)	0.62 (0.20)
Average local years of education	8.80 (1.15)	9.61 (1.14)	10.73 (0.47)	10.84 (0.42)	10.52 (1.07)	10.59 (1.17)
Sample size	3933	382	367	117	1884	550

Note: The standard deviation in brackets; #indicates that the variable is a dummy variable.

From the perspective of students' ethnicity, the minority groups of three groups of Chinese and foreign students have relatively small differences. The proportion of ethnic minority students in local students varies greatly. From the

students' gender perspective, the three groups of students in the sex ratio difference is small. In group B and group C, the proportion of only children, foreign students in the same group with local students are quite different, far below the local proportion of only child. This may be a large proportion of the rural population of migrants, while the only one-off families in rural households are less relevant.

As far as parents' educational level is concerned, Group C has the largest gap between local and overseas education, with the average difference being close to 1. A group of the smallest gap, only about 0.1. B group difference of about 0.4. This reflects that people with lower average educational levels tend to migrate to areas with higher average levels of education, as these areas tend to represent more job opportunities and higher incomes. In the family economic conditions, because the questionnaire is used in five levels of very difficult, more difficult, moderate, richer, very wealthy and other grades, scoring 1 - 5 points, the scale scores more subjective, so the group in this The data gap is small.

The characteristics of the school where the student is located include the five-category ranking of the school and the percentage of local students in the school. In terms of school rankings, the higher average school rankings reflect the higher quality of education in schools. The quality of local students in each of the three groups is higher than that of foreign students in the same group, reflecting that local students have more advantages in admissions than those in other regions. The differences among the three groups in terms of attendance at home and abroad were greatest, with local students scoring 0.5 points higher than those of non-local students. However, the difference between group A and group B is less than 0.1. Among them, group A had the smallest difference of only 0.04. This reflects the relocation of migrant children to attend school on the issue of some difficulties.

In terms of county (district) characteristics, the index selected in this paper is the average years of education in this area, with the highest scores in group B and the lowest in group A, and the data of the three groups all show that the average years of education in the regions where foreign students are enrolled are higher. This shows that migrants often choose the regions with the higher average years of their education when they choose to move in.

4. Empirical Analysis Results

4.1. Academic Performance: OLS Regression Analysis

In order to better analyze the impact of companionship on students' performance and cognitive ability, we need to control the student's own characteristics, family characteristics, school characteristics and regional characteristics. The regression equation is as follows:

$$S_{ij} = \beta_{0j} + M_i' \beta_{1j} + X_i' \beta_{2j} + F_i' \beta_{3j} + S_i' \beta_{4j} + C_i \beta_{5j} + \varepsilon_{ij}.$$

Among them, S_{ij} is the student i in subjects j (language, math) score; M_i is a student and peer relationship between the two indicators of indicators, fre-

quency and relationship evaluation score; X_i for students themselves. The characteristics include nationality, gender, whether it is an only child; a family background variable for the student, F_i including parental education background, self-evaluated family economic conditions; S_i to indicate school's characteristic variables, including the local ranking of the school, local school. The proportion of students; C_i represents the average years of schooling (counties).

Table 2 shows the regression results of each group in language scores. In group A, for local students, the higher the frequency of interaction has a significant negative impact on language scores. The higher the relationship evaluation, the more significant the positive impact on language scores. This reflects the fact that in the less-liquid areas, the high frequency of local students' interaction with their study leads to the reduction of learning time and thus to the learning outcomes. The higher the relationship evaluation, reflecting the good relations between students in this field, has a positive effect on academic performance. A group of foreign students and local students in the ratio of approximately 1:10, with local students frequency of interaction and evaluation of the relationship between the scores have a positive impact on their performance, but not statistically significant. This is partly due to the fact that the off-campus enrollment of these overseas students depends on the quality of their schools, where parents send their students to higher-quality secondary schools for study, differing less in terms of culture and geography from those of local students. The regression results of group B show that the frequency of interaction and the evaluation of relationship have a positive impact on the achievement of Chinese. The relationship evaluation has a greater impact on the achievement of foreign students than the local students, but not statistically significant. The sample of group C is the area with a large population of floating population outside of Shanghai. The frequency of contact between foreign students and foreign students has a significant negative impact on foreign students. Since the score of this index comes from the non-academic exchanges of students, Year-old foreign students have a greater appeal. Another reason may be because students who go to school in the field are less constrained by the family, leaving them less focused on learning and more entertaining. The scores of the relationship evaluation have a significant positive impact on the foreign students.

Table 3 shows the regression results of each group on math scores. The frequency of interaction among students has a significant effect on the local students in group A, and the impact is negatively correlated. The evaluation of the relationship between students has a significant positive effect on local students in group A and has a significant positive impact on both native and foreign students in group C.

4.2. Robustness Test

In order to avoid the influence of the difference of the growth environment on the research results, this study further tests the robustness of the above analysis

Table 2. Language achievement.

	(1)	(2)	(3)	(4)	(5)	(6)
	A/national core sample		B/Shanghai		C/Floating population area	
Language achievement	a1/Native	a2/Outsiders	b1/Native	b2/Outsiders	c1/Native	c2/Outsiders
Communication frequency	-0.549** (0.192)	0.420 (0.510)	0.313 (0.651)	0.292 (1.144)	0.291 (0.254)	-1.031* (0.437)
Relationship evaluation	1.076*** (0.164)	0.708 (0.504)	0.824 (0.523)	1.267 (1.073)	1.314*** (0.222)	1.498*** (0.407)
Minority	0.102 (0.535)	0.548 (1.860)	-11.49* (5.145)	3.412 (3.730)	0.451 (1.088)	0.343 (1.534)
Male	-6.052*** (0.297)	-5.953*** (0.888)	-3.023** (0.937)	-4.562* (1.832)	-4.936*** (0.435)	-3.900*** (0.752)
Only child	0.0472 (0.349)	-0.101 (1.054)	-0.552 (1.423)	-3.227 (1.958)	0.269 (0.501)	-0.0921 (0.836)
Mother education level	0.369** (0.115)	0.116 (0.343)	-0.237 (0.290)	0.192 (0.534)	0.0961 (0.143)	-0.0151 (0.267)
Father education level	0.408*** (0.107)	0.337 (0.339)	0.995** (0.305)	0.0635 (0.604)	0.755*** (0.138)	0.181 (0.256)
Family economic conditions	0.291 (0.288)	0.443 (0.945)	0.255 (1.015)	3.077 (1.852)	0.625 (0.441)	-0.302 (0.916)
School rankings	-0.320 (0.212)	-2.118** (0.640)	-0.415 (0.977)	-0.833 (1.785)	-0.583* (0.281)	-0.703 (0.470)
Local student ratio	2.149 (1.713)	-4.101 (2.683)	1.250 (3.251)	7.621 (8.750)	-2.114 (1.855)	1.315 (2.251)
Average local years of education	-0.473** (0.164)	-0.876* (0.444)	-0.434 (1.121)	-5.778* (2.241)	-0.819*** (0.232)	-0.295 (0.352)
C	72.92*** (2.857)	91.40*** (5.903)	72.47*** (13.801)	124.8*** (25.935)	78.67*** (3.046)	78.36*** (4.620)
Sample size	3933	382	367	117	1884	550
R2	0.122	0.157	0.092	0.181	0.120	0.088

Note: The standard deviation in brackets, *p < 0.05, **p < 0.01, ***p < 0.001.

results. In the following tests, we try to directly compare the samples with similar characteristics and analyze the impact of the relationship between the two indicators of peer relationships and the relationship evaluation on the academic performance of students.

Table 3. Mathematical achievement.

	(1)	(2)	(3)	(4)	(5)	(6)
	A/national core sample		B/Shanghai		C/Floating population area	
	a1/Native	a2/Outsiders	b1/Native	b2/Outsiders	c1/Native	c2/Outsiders
Mathematical achievement						
Communication frequency	-0.593** (0.203)	0.421 (0.552)	1.122 (0.708)	1.453 (1.090)	0.217 (0.263)	-0.552 (0.447)
Relationship evaluation	1.390*** (0.173)	0.119 (0.545)	0.306 (0.568)	0.449 (1.022)	1.329*** (0.230)	1.544*** (0.417)
Minority	0.183 (0.565)	-2.168 (2.013)	-6.202 (5.590)	-0.919 (3.553)	0.764 (1.125)	2.445 (1.571)
Male	-1.261*** (0.314)	0.208 (0.962)	1.356 (1.018)	0.196 (1.745)	-1.354** (0.450)	0.176 (0.770)
Only child	0.194 (0.369)	-0.855 (1.140)	1.784 (1.546)	-1.745 (1.865)	1.163* (0.519)	-1.426 (0.856)
Mother education level	0.474*** (0.121)	0.291 (0.371)	-0.162 (0.315)	-0.115 (0.508)	0.0933 (0.148)	-0.0573 (0.273)
Father education level	0.292* (0.114)	0.787* (0.367)	0.853* (0.331)	0.572 (0.575)	0.788*** (0.142)	0.0972 (0.263)
Family economic conditions	0.305 (0.305)	0.420 (1.022)	-0.210 (1.103)	2.350 (1.764)	0.360 (0.456)	-0.822 (0.938)
School rankings	-0.425 (0.225)	-1.580* (0.693)	-0.0170 (1.061)	-1.350 (1.700)	-0.619* (0.291)	-1.140* (0.481)
Local student ratio	0.00950 (1.811)	-3.284 (2.904)	1.077 (3.532)	-4.461 (8.334)	-2.602 (1.919)	2.687 (2.306)
Average local years of education	-0.608*** (0.173)	-0.695 (0.480)	0.331 (1.218)	-3.000 (2.134)	-0.900*** (0.240)	0.156 (0.361)
C	74.10*** (3.020)	81.49*** (6.389)	60.39*** (14.994)	101.1*** (24.702)	78.42*** (3.151)	74.48*** (4.732)
Sample size	3933	382	367	117	1884	550
R2	0.036	0.041	0.057	0.098	0.060	0.048

Note: The standard deviation in brackets, * p < 0.05, ** p < 0.01, *** p < 0.001.

Regression analysis is performed on samples from rural households. The growth environment of rural students and non-agricultural students is quite different. The non-agricultural students' off-site students may be due to the mobilization of their parents' work relationships, and some may even be due to the

talent introduction program. Comparing them with local students may have an impact on the accuracy of the findings. We only conduct regression analysis of students in rural households in each group.

Contact frequency and relationship evaluation for adding control variables to parent-child relationships. The ways in which parents and children get along in different families The ways of education affect the performance of students in the school environment. Students who interact with parents frequently may also promote the development of their cognitive abilities. The relationship with parents is highly rated and may be easier when it comes to entering a new environment. Taking into account the influence of family environment on students, we may exaggerate the frequency of association and the impact of relationship evaluation on academic performance and cognitive ability. We add two indicators of parent-child relationship frequency of parent-child contact and parent-child relationship evaluation to control family education Its impact. According to the measurement method of Zhang Ling (2016), the contact frequency in parent-child relationship is calculated through six measurement questions: you and your parents have dinner, reading, watching TV, doing sports, visiting museums, going to zoos, science museums, etc. Cronbach's $\alpha = 0.7724$), the six-point scale (never done, once a year, once every six months, once a month, once a week, weekly More than one) score plus, converted to Z score as the score. The evaluation of the relationship with parents mainly through the topics discussed by their children and parents reflects that the higher the degree of confident feelings of their children to parents, the higher the quality of parent-child relationships. Take the following ten questions into account and discuss with your father and mother how often school happens, your relationship with friends, your relationship with your teacher, your mood, your thoughts or your worries, etc. (Cronbach's $\alpha = 0.8762$). The three-point scale (never, occasionally, and often) of each question is summed up and its Z score is used as the indicator.

Table 4 shows the regression results of the test for the robustness of Chinese scores. Students who restrict their sample to rural hukou have a significant negative impact on the students' language scores in group A with the frequency of interaction with their classmates. The coefficient is -0.642 . The influence increases. However, the impact on foreign students in Group C is no longer significant. The score of relationship evaluation still significantly influences the language proficiency of local students in group A, and the coefficient decreases to 0.909 . The impact on foreign students in group C is still significant, with a factor of 1.212 . After adding two indicators relates to parent-child relationship to control the differences in family environment, the frequency of interaction with classmates still has a significant negative impact on local students in group A, with no significant difference in coefficients. The impact on foreign students in Group C is also significant, with the coefficient decreasing to -1.148 , with an increased impact. The impact of the evaluation on the local students in Group A and the students in Group C is still significant, with coefficients of 0.843 , 1.058 ,

Table 4. Language achievement: Robustness Test.

	(1)	(2)	(3)	(4)	(5)	(6)
	A/national core sample		B/Shanghai		C/Floating population area	
Language achievement	a1/Native	a2/Outsiders	b1/Native	b2/Outsiders	c1/Native	c2/Outsiders
Communication frequency	-0.549** (0.192)	0.420 (0.510)	0.313 (0.651)	0.292 (1.144)	0.291 (0.254)	-1.031* (0.437)
Relationship evaluation	1.076*** (0.164)	0.708 (0.504)	0.824 (0.523)	1.267 (1.073)	1.314*** (0.222)	1.498*** (0.407)
Sample size	3933	382	367	117	1884	550
1) Students who only include groups of rural households						
Communication frequency	-0.642** (0.246)	0.598 (0.751)	-2.802 (3.836)	1.618 (2.547)	0.702 (0.475)	-0.797 (0.551)
Relationship evaluation	0.909*** (0.205)	0.521 (0.673)	2.296 (3.034)	5.239 (3.143)	0.744 (0.396)	1.212* (0.489)
Sample size	2598	217	28	37	548	340
2) Add control variables parent-child relationship variables (contact frequency and relationship evaluation)						
Communication frequency	-0.542* (0.211)	0.0692 (0.563)	0.651 (0.674)	-0.294 (1.356)	0.392 (0.271)	-1.148* (0.493)
Relationship evaluation	0.843*** (0.178)	0.430 (0.550)	0.766 (0.542)	1.186 (1.146)	1.058*** (0.242)	1.643*** (0.442)
Sample size	3488	333	351	110	1746	491

Note: The standard deviation in brackets, *p < 0.05, **p < 0.01, ***p < 0.001.

and 1.643, respectively. From the coefficient we can see that the impact of the relationship evaluation on the first two groups decreases, and the influence on the last group becomes larger, which are all positively related.

Table 5 shows the regression results of the robustness test on the mathematics scores. The sample is limited to students in rural households. The frequency of interactions with classmates has a significant negative effect on the mathematics scores of local students in group A, with a coefficient of -0.796. Increase. The impact of the relationship evaluation on the local students in Group A and the students in Group C is still significant. The correlation coefficients are 1.352, 1.456, and 1.454, respectively. The impact on local students in Group A weakened, and the impact on local students in Group C increases. The impact on

Table 5. Mathematical achievement: Robustness Test.

	(1)	(2)	(3)	(4)	(5)	(6)
	A/national core sample		B/Shanghai		C/Floating population area	
	a1/Native	a2/Outsiders	b1/Native	b2/Outsiders	c1/Native	c2/Outsiders
Mathematical achievement						
Communication frequency	-0.593**	0.421	1.122	1.453	0.217	-0.552
	(0.203)	(0.552)	(0.708)	(1.090)	(0.263)	(0.447)
Relationship evaluation	1.390***	0.119	0.306	0.449	1.329***	1.544***
	(0.173)	(0.545)	(0.568)	(1.022)	(0.230)	(0.417)
Sample size	3933	382	367	117	1884	550
1) Students who only include groups of rural households						
Communication frequency	-0.769**	1.353	2.142	1.907	0.00817	-0.204
	(0.260)	(0.753)	(3.157)	(2.208)	(0.515)	(0.627)
Relationship evaluation	1.352***	0.296	1.779	4.262	1.456***	1.454**
	(0.217)	(0.675)	(2.497)	(2.725)	(0.429)	(0.557)
Sample size						
Communication frequency	2598	217	28	37	548	340
2) Add control variables parent-child relationship variables (contact frequency and relationship						
Communication frequency	-0.692**	0.319	1.366	-0.0323	0.328	-0.435
	(0.225)	(0.626)	(0.758)	(1.249)	(0.286)	(0.511)
Relationship evaluation	1.256***	-0.345	0.417	0.148	1.117***	1.584***
	(0.190)	(0.611)	(0.610)	(1.056)	(0.254)	(0.459)
Sample size	3488	333	351	110	1746	491

Note: The standard deviation in brackets, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

foreign students in the same group weakens. After adding the control variable of parent-child relationship, the negative effect on the mathematics performance of group A's local students is still significant, the coefficient is -0.692 , and the influence increases. The relationship evaluation still has a significant positive impact on the local students in Group A and the overseas students in Group C, with correlation coefficients of 1.256 , 1.117 and 1.584 , respectively. The impact on the first two groups is reduced and the impact on the last group increases.

5. Conclusions and Discussions

This paper analyzes the impact of peer interactions on language achievement and mathematics achievement, based on the China Education Follow-up Survey data from the 2013-2014 school year in the large-scale follow-up survey project designed and implemented by China Survey and Data Center of Renmin University of China. We come to the following conclusion:

1) There are differences in the influence of peer relationships on academic performance in different regions.

In Shanghai's sample, there is no significant correlation between peer relationship and academic performance. In the sample of Shanghai, the two indexes of peer relationship selected in this paper have no significant effect on the students' Chinese and math performance, which highlights the particularity of mega-cities. In areas with large numbers of migrants, the quality of peer relationships has a greater effect on academic performance and cognitive ability than on national core samples with fewer migrants.

2) The impact of peer relations on students in different regions in China and foreign countries is different.

In areas with a large number of floating population, peer relationships significantly affect the academic performance of overseas students. In the national core sample, peer relationships significantly affect the academic performance of local students, with no significant impact on foreign students.

In areas where the number of migrants is relatively small, local students occupy the largest proportion of students. The frequency of interactions between students and classmates in foreign countries is slightly higher than that of local students. The evaluation of relations between students and students is slightly lower than that of local students. The frequency of interactions between local students and Chinese and mathematics shows a significant negative correlation, and the relationship evaluation shows a significant positive correlation with them. These two indicators have no significant effect on the students in the group. In the areas where there are more floating population in China, the frequency of contacts between local students and their classmates is double that of foreign students, and there is not much difference in relational evaluation. For areas with a large number of floating population in the country, the evaluation of relations has a significant positive impact on the language and mathematics of the students from other places. In Shanghai's sample, the average score of the two indicators of foreign students is higher than that of local students.

3) There are differences in the impact of peer relations on Chinese and mathematics, Among them, the least impact on the language proficiency. In the national core sample, peer relationship evaluation has the greatest impact on mathematics performance, and has the least impact on language performance. The influence of the peer relationship evaluation on the language performance and mathematics achievement of local students is 1.076 and 1.390 respectively. In the samples with a large number of floating population, the relational evaluation of peer relationship has a language and math influence coefficient of 1.314 and 1.329 respectively on local students, with the least impact on the Chinese language. The relational evaluation of peer relations on foreign students in language, mathematics influence coefficient respectively 1.498, 1.544. After adding the parent-child relationship variable to control the family environment in the sample of rural students, the relevant differences still exist.

4) There is a significant positive correlation between students' evaluation of peer relationship and academic achievement, and the impact of communication frequency on academic performance may be poor.

The influence of the two indicators of peer relationship interactions and relationship evaluation on students' academic performance is different. The frequency of communication has a significant negative impact on the language performance and mathematics performance of local students in the national core sample; it has a significant negative impact on the language performance of foreign students in a large sample of floating population.

The quality of peer relationship to the student's academic performance and cognitive ability has a significant positive effect, so by peer relations between some intervention plans to improve students can promote their healthy growth. According to this article research results, this paper puts forward the following Suggestions: 1) In regions with a large number of floating population, peer relationships to influence on middle school students' academic performance and cognitive abilities, and peer relations intervention in the region to establish the corresponding courses, such as group guidance, make the middle school students' individual has appropriate and effective communication skills and strategies, so as to accelerate the improvement of the students in the sound of the personality and interpersonal relationship. 2) Across the country, the local students' academic performance and cognitive abilities are greatly influenced by peer relationship, school education pay close attention to local students peer relations, to promote the healthy growth of the local students. 3) According to the influence of peer relationship on the performance of different subjects, the organization ADAPTS the form of classroom interaction to improve the teaching effect. In core samples in the country, with less of the floating population of the region, and peer relationships to influence is greater than its impact on language result in math, such as in math class in the form of group discussion, etc to promote the improvement of peer relationship, or can better stimulate students' learning enthusiasm and achieve better teaching effect.

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