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Parental edation, family income, and peer group on children's academic performance in China

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SENIOR THESIS

PARENTAL EDATION, FAMILY INCOME AND PEER GROUP

ON CHILDREN'S ACADEMIC PERFORMANCE IN CHINA

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Abstract: Previous studies have established that children from richer family backgrounds are generally observed to have higher educational outcomes than other youth. However, the mechanism through which household income affects the child's outcomes remains unclear. Meanwhile, other studies point out that parental education and the peer effects also have influences on children's achievement. This paper estimates the effects of parental human education, family income and peer group on children's education performance using a data of about 300 students from primary and high schools in China which includes extensive background information at the student, parents and friend level. The research finds that the effect of parental education and family income is slight on children's academic results, while the peer effect is discovered to be significantly associated with students' academic outcomes. Furthermore, there is a positive correlation between mother caring and children's academic achievement.

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1. INTRODUCTION

Factors that affect children's education attainment have been studied for years, and kinds of areas are concerned. One of the main arguments is whether parental education affects children's academic attainments or not.

It has already been reported that less educated parents are more likely to face liquidity constraint preventing their children form fulfilling their schooling potential (Becker and Tomes, 1986). Back to the end of last century, Cameron and Heckman (1998) conducted a research in US and point out that the effect of financial constraints on educational choice is less important that the effect of family background, which mainly indicates parental education. On the other hand, Krueger and Lindahl (2001) found that financial condition significantly impacts on children's education. According to Haveman and Wolfe (1995), the family is regarded as a production unit which put resources to generate utility for its members. Adult make decisions based on the economic condition and children are affected choices that parents have made. As a result of that, in high income family, children's academic attainment will be high due to parents are able to put more resources on children's education and children are access to education more easily.

What's more, surrounding environment has a clear impact on people. A famous research finds that the recovery rate is high if the patient shares a room with a

roommate who has already had a similar operation. Using the same train of thought, peer effects cannot be isolated when measuring effect factors of children's education. The most influential piece of peer effects is 'Equality of Education Opportunity' (Coleman et al., 1996). Collecting a database of over half a million students form almost 3000 primary and secondary school, he got a conclusion that "a pupil's achievement is strongly related to the educational background and aspirations of the other students in the school." Furthermore, McEwan (2003) conducted empirical studies to show that large positive effects of peer quality on academic achievements.

   In this research, effects of parent's educational background, household income and peer group on children's academic outcomes are measured. Situations in the city and county in China are be analyzed dividedly, which is rare in previous studies. In the next section I provide background on the academic literature related to the topic. I then discuss models related to measuring determinants of children's academic performance and make hypothesizes. In section four, I turn to a description of the methodology used in my analysis. Empirical results and further discussion are presented in section five and six. Finally, limitation of the study and concluding remarks are given in section seven.

2. LITERATURE REVIEW

2.1 Parental Education Effect

From last century there are more and more researches on the processes try to explain why some children are better than other youth by comparing their schooling attainments, occupation and earnings. Havemand and Wolfe (1995) reviewed literatures on determinants of children's achievements and reported that both parents' educational background and family income are the important factors of a child's attainments. A considerable literature has focused on the effects of parental background on outcomes of their children, such as cognitive skills and education attainments. The view that more educated parents can provide a better environment for their children to get a higher academic achievement has been the basis of many interventions.

The early identification strategy is to use instrumental variable methods based on experiments or policy reforms that change the educational distribution of the parents without studying factors directly affecting children (Chevalier, Harmon, Sullivan and Walker, 2005). A famous research using the instrumental variables methods is to identify the effect of parental education on their children's schooling attainment is causal by examining the minimum school leaving age (SLA) conducted by Chevalier (2004). Identifying data from the British Family Resources Survey, he found that

parental education does have a significant effect on their next generation's academic achievement. Each extra year of education at the parental generation increases the probability of children staying on by 4 percentages. Besides, Oreopoulos, Page and Stevens (2006) using US Census data from 1960 to 1980 in the same method proved a similar result that educated parents have positive influences on their children's educational results. It is reported that an increase in parental education by one year decreases the probability of a child repeating a schooling year by between 2 and 7 percents.

The other aspect to study parental human capital is genetic effect. Studies to compared adopted and natural children are conducted. Sacerdote (2004) reported that assuming adopted children are randomly allocated to families, and the families are not able to choose which child they would like to adopt, maternal education on children's education is positive. Furthermore, Bjorklund et al. (2004) used a register of Swedish adoptees to control both natural and adoptive parents' education. He find that each year of adoptive maternal education adds 0.05 years of schooling to the child and increases the likelihood of attending university by 6 percentages, meanwhile, parental education effects are about 40 percent higher. Even after testing the various biases due to the non-randomness of adoptions, the results do not affect the previous conclusion. Nevertheless, Behrman and Rosenzweig (2005) analyzed the Minnesota Twins Register female twins' data to identify education levels of their children. In their model, it shows that one year of parental schooling increased children's years of

education by about 26%.

2.2 Family Income Effect

The literature on the causal effects of parental earnings on educational outcomes is not as extensive as the literature on parental education. People generally hold the view that children from poorer backgrounds are observed to have lower educational outcomes. However, whether the income effect is causal, or merely reflects the correlation of income and some unobservable characteristics of the parents remains unclear (Mayer, 1997). Mayer examined the link between children's outcomes and parent's income from assets and child support payments. The research finds that such income has a smaller positive impact on overall income on children's test scores, dropping out of school.

As advocated by Becker and Tomes (1986), poorer families are financially constrained with prevents them from investing in the human capital of their offspring. The effect of family income on child's attainment is direct, thus, policies of financial support can reduce the differences in achievement between children from different background. In the absence of government intervention, we would expect children born to rich parents to acquire more human capital than children born to poor parents if capital markets are imperfect.

Moreover, Rice (1987) for the UK and more recently Acemoglu and Pischke (2000) for the US, found that family income has a strong effect on the child participation in post-compulsory education. Rice analyzed data for a sample of juveniles aged 16-17 years taken from the Family Expenditure Survey. The result of the study indicates that, household income in not a significant factor in the decision to continue in full-time education for the juvenile male population. By contrast, educational participation for female is significantly affected by household income. What's more, Acemoglu and Pischke used change in the income distribution over time and across states to indentify the effect of family income on college enrolment and estimate an income elasticity of 0.14.

On the other hand, Harmon and Walker (2000) for the UK rely on schooling contingent income to identify income effect, however, they found it has no effect on the probability of staying in post-compulsory education.

Blau (1999) examined that relationship between parents' income and children's test scores using the matched mother-child data from the National Longitudinal Survey of Youth (NLSY). The research finds that income has a small positive effect on test score. Some critics on Blau pointed that the approach just focuses attention on short-run variation in parents' income, rather than the long-term. Cameron and Heckman (1998) also supported the idea that educational decisions do not stem from short-term financial constraints but have their origins in the long-term effects of family

characteristics. In addition, Chevalier and Lanot (2002) proposed a methodology that separates the effect of family income and characteristics, by holding constant the family characteristics while allowing for changes in income, similarly to Harmon and Walker (2000), but they found that the effect of family income on a child's schooling attainment is rather limited and is dominated by the effect of other family characteristic, mostly the parental education.

Instrumental variables method also has been used to identify the effect of parental income effects on child outcomes. Shea (2000) use union status as an instrument for parental income. The research found that changes in parent's income have a negligible impact on children's years of schooling.

Researchers have attempted to identify the effect of either parental education or of parental income, but not both effects simultaneously. In this paper, I put those two factors in a same function to examine how they affect children's educational outcomes.

2.3 Peer Effect

Another important indicator of children's attainment in this study is peer effect. There is a large empirical literature that seeks to measure the importance of peer group influence in determining the academic performance of the child. Summers and Wolfe

(1977), for example, have found that, hold other things unchanged, students perform at a higher level if their fellow students are high achievers. What's more, Henderson, Mieszkowski, and Sauvageau (1978) employed data from approximately seven thousand Montreal students between the first and third grades. Their study found compelling evidence that peer effects were important. Besides, higher-achieving roommates also have effects on academic performances (Hall & Willerman, 1963). While, Zhang (2009) used the data from middle school in China by focusing on potential correlation in measurement errors between the individual- and the peer- level regressors to prove that peer effects on students' academic outcomes are small.

Besides, Robertson and Symons (1996) used the British National Child Development Survey data by studying math and reading scores of children aged at seven or eight. They found that peer effects are positive, and evidence shows that students were best off if they are in the top group of a school that sorted by ability and worst off in the bottom group of such a school. While they were not able to trace the exact channel by which the peer group influences attainment, it seems that a better group brings with better behaved children, a belief in the value of education, and parents who actively scrutinize the teaching process.

Most of the research literature on peer effect in education has focused on elementary and secondary school. Zimmerman (2003) conducted an empirical study by using the date from Williams College to measure peer effects of university's

students' academic outcomes. He used data on individual students' grades, their SAT scores and the SAT scores of their roommates. The research suggests that peer effects are almost linked more strongly with verbal SAT scores than with math SAT scores. Meanwhile, students who belong to the middle of the SAT category may have worse grades if their roommate is in the bottom 15% of the verbal SAT distribution.

There are other studies focused on ability grouping on student achievements. It is popular that schools group students based on their ability and academic performance. Kerckhoff (1986) used the British data to show that student in the high ability class do better than the average student at an ungrouped school, while students in a low ability class at a grouped school do worse than the average student at an ungrouped school. But students form high ability class may more likely get more resource, such as better teachers, learning technology, which also will improve students' grades. As a result of that, peer effects of ability grouping students may be affected by other factors.

3. EMPIRICAL MODEL AND HYPOTHESIS

3.1 Model

As mentioned before, parental schooling, family income and peer effects are both important factors on children's academic achievement. In this section I address three models concerning these factors. I assume that the function is a linear function of

observed variables such as family characteristics and peer effects.

The first model tests the effects of parental education and household income on children's education. The function can be described as follows:

Children's final grade

$$= \beta_0 + \beta_1\, fed1 + \beta_2\, fed2 + \beta_3\, med1 + \beta_4\, med2 + \beta_5\, tincome$$

(1)

where fed1= father's education dummy1 = 1, if the father accepted middle school education or above; fed2= father's education dummy2, if the father accepted high school education or above; med1=mother's education dummy1 =1, if the mother accepted middle school education or above; med2= mother's education dummy2 =1, if the mother accepted high school education, and tincome = total family income of the year 2009, and an error item β_0.

In second model, I focus on the effects of parental education and family income in situation parents who stay at home with their children most of time in this semester by using the fist database. The function is presented as:

Children's final grade

$$=$$

$$\beta_0 + \beta_1\, fed1 + \beta_2\, fed2 + \beta_3\, med1 + \beta_4\, med2 + \beta_5 tincome + \beta_6\, pl + \beta_7\, fsl + \beta_8 ml$$

(2)

where the first 5 variables are same as function (1), and pl = both father and mother leave home most of time in current semester; fl = only father leaves out of home, while mother stays at home with child; ml = only mother leaves out of home most of time, while father stays with child at home.

The last model adds peer effects as another independent variable, which aims at testing the effects of parental education, family income and peer effects on children's academic performance. The second database is used, and the function is:

Children's final grade

$=$

$$\beta_0 + \beta_1 fed1' + \beta_2 fed2' + \beta_3 med1' + \beta_4 med2' + \beta_5 tincome + \beta_6 fgrade + \beta_7 dgrade$$

(3)

Where $fed1'$= father's education dummy1 = 1, if the father accepted high school education or above; $fed2'$= father's education dummy2, if the father accepted university education or above; $med1'$=mother's education dummy1 =1, if the mother accepted high school education or above; $med2'$= mother's education dummy2 =1, if

the mother accepted university education, tincome= total income of family per month.

Furthermore, fgrade = final grade of students' friend, and dgrade = final grade of

student's deskmate and an error item β_0.

3.2 Hypothesis

The effects of parent's educational background, household income, and peer effects

on their children's academic performance will be examined in above three functions.

Target on students in primary and high schools in China, students' final examination

grade is indicated their academic result, and three main outcomes are hypothesized: (1)

parental education will be positively correlated with the children; (2) the effect of

household income will be significance; and (3) peer effects have positive impact on

children's educational outcome.

Nevertheless, some special situations are concerned during the research.

First of all, I concern the situation that whether or not parents stay at home with

children in current semester. Mother's characteristics have an important effect on

children's education, for example, one more year of maternal schooling increased

children's years of education by 13% (Behrman and Rosenzweig, 2002). The situation

that parents at home or not may be related with children's academic performance.

As a result of mentioned before, other variables are measured in the research, for example, situation of both parents out of home. Some results are expected, for example: the effect of parental caring on children's academic achievement is significant.

4. METHODOLOGY

4.1 Participants and Data

Two databases are built in this research, which contains two groups of students aged 9-17 in two places and two kinds of questionnaires are made in accordance with different conditions.

4.1.1 The First Sample

The first group of students is from four villages of Longhui County, Hunan Province. The population in Longhui County is approximately 1,216,800 and the GDP per capita is about 5449 RMB. There is an increasing trend in Longhui that more and more young parents working out of villages where can make more money, such as Guangzhou, Shenzhen. Therefore, their children are left at home with grandparents or other relatives. Among 192 collected samples, only 24 children's parents stay at home in this semester (September to January, 2009), the rest of 168 children's parents or one of parents is out of home to work. In this research, the effects of parents leaving with

children, mother or father staying with children on children's academic attainment are measured respectively.

Four classes in four primary schools in previously mentioned four villages are covered. 192 students were asked to finish the questionnaire, including 125 male and 67 female. Furthermore, among four classes, two-class students are grade three, another one is grade four and the last one is form grade five.

The questionnaire are made up of three parts to examine causal effects of children's academic attainment: the parental part, which is finished by parents or other guardians; the student part, which is completed by students themselves; and the teacher part, which is filled by the teacher in charge of the class. Questionnaires were distributed by a teacher in parent's meeting. Because not all parents came to attend parent's meeting, among 192 questionnaires, 71 of them were completed by students themselves, which may be caused errors due to students do not know detailed information of their parents.

4.1.2 The Second Sample

The second data is collected in Kunming, the capital of Yunnan Provinces, where total population is nearly 6 million and the GDP per capita is about 27,140 RMB. Children in Kunming almost are well-raised, and also have rich resources to access education

channel. What's more, parents there are relatively well-educated and make more money than families in country. 120 grade two students in one key high school were asked to complete the questionnaires. 62 are male and 58 are female, which the number of girls and boys is quite even. Because the questionnaire was distributed by the teacher in the lecture, the response rate is 100%. However, limited by the intellectual ability of participants or lack of information on their parents, responses of low reliability had to be ruled out (e.g. response with missing many questions, answers of certain questions that obviously to be unrealistic), and 110 valid copies were left in this study (57 are male and 53 are female).

The second questionnaire is different from the first, which requires students to finish it only. Questionnaires were done without teacher monitoring, which guarantees that students are not afraid of being punished due to write truth on certain questions, such as studying hour per day, whether or not prepare the lesson and so forth.

Finally, both groups of students' math and Chinese grades are from teachers, which are 100% true and not be altered.

4.2 Methodology

A questionnaire is designed to gather basic information of participants, such as parental education level, family income, studying hours and other basic background. My empirical study requires that I measure several main factors, which are illustrated

as follows:

Academic achievement is indicated by the students' final grade, which is the sum of Chinese grade and math grade. Final grade is provided by teachers.

Parental education variable is measured by which schooling level parents have accepted, such as primary school, middle school, high school, university and so forth. Two dummies are added in father and mother's educational background respectively based on data distribution.

Furthermore, family income is measured by how much money the family makes per month or per year, which is the sum of father and mother's salary per month or per year.

Questionnaire also asks whether or not parents stay at home, such as describe the situation of father staying at home in this semester: a. most of time at home; b. more than half of time at home; c. less than half of time at home; d. most of time not at home. What's more, three dummies are added to indicate situations of parents at home, mother at home and father at home.

In addition, peer effects indicated by the relationship between students' academic outcome and their friend's and deskmate's academic performance. The academic

performance is the sum of final Chinese grade and math grade.

Finally, the first sample focuses on the situation whether parents stay at home to tutor their children studying, while the second sample aims at testing the peer effects on students' academic performance. Both of samples are used to measure the effect of parental education background and family income on children's academic achievement.

5. EMPIRICAL RESULT

5.1 Descriptive Statistics and the Correlations

Descriptive statistics (means and standard deviation) for the variables in this study are shown in Table 1 and 2.

Table 1 presents descriptive statistics for final grade, total annual family earning, father and mother education level and the situation that parents at home for the first sample. On average, we could know that the mean of final grade is 128.3 where the full mark is 200 (math 100, Chinese 100), which almost students can pass the examination (60 is pass mark for each course). In cities of China, the average grade of pupils is about 170-180, especially in the big city, where the average grade is above 180, which means students can get 90 marks for each course. Therefore, generally

speaking, students in Longhui did not study well. What's more, the standard deviation

of total annual income is very large, because not both parents have jobs in few family

which make the gap between income is very significant. Furthermore, means of

parents' education level are above 3, which indicate that most of them accepted

middle school education, but number of them did not finish full middle school

education. Nevertheless, situation of parents leave home is significant. Means of

parents leave home are bigger than 3, which tell that parents in Longhui Province

spent less than half of time stay with their children.

Table 1
Means and standard deviations of main factors for the first database (n=192)

Descriptive Statistics

	Mean	Std. Deviation
Final grade	128.3	40.61
Total annual earning	36590	41520
Father education level	3.79	1.36
Mother education level	3.34	1.31
Father leaves	3.401	1.076
Mother leaves	3.09	1.319

   Same as Table 1, Table 2 shows descriptive statistics for students themselves', their

friend's and their deskmate's final grade, total annual family income and parent

education level for the second sample. Form Table 2, some facts we could find. Mean

of students' final grade is 194.15 where the full marks is 300 (150 for each course)

and the standard deviation is 29.22. Students in this high school can get about 97 for

each course which just above the pass mark (90 for each course). In addition, mean of

total annual earnings is 55,502.76, where is almost 20,000 higher than villages in

Longhui. Besides, parents in Kunming also have accepted higher education compared to parents in Longhui. Means of parental education level are above four, which represents that parents have finished high school education at least and the difference between mother and father is not significant

Table2
Means and standard deviations of main factors for the second database (n=110)

Descriptive Statistics

	Mean	Std. Deviation
Final grade	194.15	29.22
Final grade of the friend	193.02	28.7
Final grade of the deskmate	187.24	32.83
Total annual earnings	55502.76	2181.47
Father education	4.78	1.66
Mother education	4.32	1.62

Meanwhile, the correlations show that the indicators within the latent constructs are related to each other, which being presented in Table 3 and 4.

Table 3 illustrates correlation of main variables of the first sample, including student's total grade, total family income, father and mother education level, and the situation of father and mother out of home, and both parents leaves home. From the table, we could tell that correlation between father education level and children's final grade is significant, as well as with total family income. Moreover, mother education level is highly correlated with father education level. In addition, children's final grades also have significant correlation with the situation of father or mother out of

home, and both parents leave home. Meanwhile, the three variables of father, mother, and both parents out of home are positively correlated.

Table 3

The variables correlations for the Longhui sample (n=192)

Correlations

	1	2	3	4	5	6	7
1. Total final grade	1						
2. Total income	.085	1					
3. Father education level	.231**	.208**	1				
4. Mother education level	.187*	.103	.534**	1			
5. Parent leaves home	-.213**	-.026	-.004	.042	1		
6. Father leaves home	-.143*	-.066	.024	.044	.741**	1	
7. Mother leaves home	-.274**	-.047	-.075	-.035	.935**	.693**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Moreover, correlations among main variables in the second sample also are analyzed at follow table (Table 4). Variables consist of students' total grade, their friend's and deskmate's total grade, father and mother education level, and total family income. The correlation between students' final grade and family income is significant. What's more, father and mother's education level have a strong relation.

Nevertheless, table shows that both friend's and deskmate's total final grade are positively related with students' total grade, which is 0.305 and 0.438, respectively.

Table 4

The variables correlations for the Kunming sample (n=110)

Correlations

	1	2	3	4	5	6
1. total final grade	1					
2. total income	-.242*	1				
3. father education level	-.022	.235*	1			
4. mother education level	-.070	.094	.628**	1		
5. Friend's total grade	.305**	-.147	.112	.093	1	
6. Deskmates' total grade	.438**	-.273*	.042	-.032	.647**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

5.2 Results

This section presents estimates of the impact of parental education, family income and peer effects on children's academic achievement. Table 5, 6, 7 and 8 presents results of the effect of parental education, family income and peer effects on children's final grade.

Table 5

Results for regression of effects of parental education and family income on children's final grade (results for the first sample, n=192)

Children's final grade

$= \beta_0 + \beta_1 fed1 + \beta_2 fed2 + \beta_3 med1 + \beta_4 med2 + \beta_5 tincome$

	The first nple	P value
Father education level (middle school or above)	4.46 (-8.083)	0.582
Father education level (high school or above)	17.331 (9.9) *	0.082
Mother education level (middle school or above)	9.712 (11.225)	0.388
Mother education level (high school or above)	2.512 (7.61)	0.742
Total family income	0.00007 (0.00006)	0.295
F Statistics	1.636	
Adjusted R-squared	0.017	

*p<.05.   **p<.01.   ***p<.001.

After calculation the estimated model (1) can become based on the sample one:

$$\widehat{Children's\ final\ grade} =$$

$$4.46\ \widehat{fed1} + 17.331\ \widehat{fed2} + 9.712\ \widehat{med1} + 2.512\ \widehat{med2} + 0.00007\ \widehat{tincome}$$

where parental education level is divided into middle school above and high school above. For instance, the variable fed1, indicates father who have accepted middle school education or above, with t= 0.552 (p=0.582>0.05), is not a statistically

significant indicator. It means that with 1 unit increase of father who has accepted middle school education or above, it increases 4.46 unit of children's final grade. While fed2 is a significant indicator, with t=1.751 (p=0.82<0.01). It means that 1 unit increase of father who have accepted high school education or above, children's total grade will increase 17.331.

From Table 5, father education has a positive impact on children education, only if father have accepted high school education or above. Other variables have no significant effects on children's grade, including family income and mother education, based on the sample one data.

Table 6
Results for regression of effects of parental education and family income on children's final grade (results for the second sample, n=110)

Children's final grade $= \beta_0 + \beta_1 \text{fed1} + \beta_2 \text{fed2} + \beta_3 \text{med1} + \beta_4 \text{med2} + \beta_5 \text{tincome}$

	The second sample	P value
Father education level (middle school or above)	2.217 -8.14	0.794
Father education level (high school or above)	12.135 -9.471	0.203
Mother education level (middle school or above)	0.004 -7.871	1
Mother education level (high school or above)	-11.16 -8.553	0.195
Total family income	0.003 (0.001) **	0.017
F Statistics	1.791	

Adjusted R-squared	0.04

*p<.05.   **p<.01.   ***p<.001.

And the second sample becomes:

$$Children's\ final\ grade=$$

$$2.217\ \widehat{fed1} + 12.135\ \widehat{fed2} + 0.004\ \widehat{med1} - 11.16\ \widehat{med2} + 0.003\ \widehat{tincome}$$

like the function above, it show the correlation between variables and children's educational attainment. Here parental education is divided into high school or above and university above. Because the situation of city (sample two) is different with county (sample one). Among these variables, there is one worth to notice is that med1, it represents mother who have accepted high school education or above. With t= 0.001 (p<0.05), it is not a significant indicator, which means with 1 unit increase of mother who have accepted high school education or above, children's grade will decrease 11.16 unit.

Form the column of the second sample on Table 5, it can be known that variable tincome, indicates total family income is a statistically significant factor with t=2.420 (p=0.017<0.05). It means that 1 unit increase of total family income, children's academic outcome will increase 0.003, which shows that under the second sample situation, family income has positively impact on children's academic achievement. While, parental income has no significant influence on children's education.

In addition, Table 7 presents that the effects of parental education and family

income on children's academic attainment when adding the variables of whether or

not parents at home.

Table 7

  Results for regression of effects of parental education, family income and situation of father, mother and parents out of home on children's final grade (based on the first sample data, n=192)

Children's final grade =

$+ \; \beta_1 \text{fed1} + \beta_2 \text{fed2} + \; \beta_3 \text{med1} + \beta_4 \text{med2} + \beta_5 \text{tincome} + \beta_6 \text{pl} + \beta_7 \text{fl} + \beta_8 \text{ml}$

	The second sample	P value
Father education level (high school or above)	0.717 (-7.936)	0.96
Father education level (university or above)	12.119 (-9.698)	0.25
Mother education level (high school or above)	(6.938) -10.916	0.569
Mother education level	(8.258)	0.32
(university or above)	-7.529	
Total family income	0.00006 (0.000)	0.393
Both parents leave home	22.096 (17.72)	0.214
Father leaves home	-1.391 (9.59)	0.884
Mother leaves home	-45.566 (16.884)**	0.008
F Statistics	3.275	
Adjusted R-squared	0.088	

*p<.05.   **p<.01.   ***p<.001.

Data from the first sample is calculated, and the model (2) becomes:

$$\widehat{Children's\ final\ grade} =$$

$$0.717\ \widehat{fed1} + 12.119\ \widehat{fed2} + 6.938\ \widehat{med1} + 8.258\ \widehat{med2} + 0.00006\widehat{tincome} +$$
$$22.096\ \widehat{pl} - 1.391\ \widehat{fl} - 45.566\widehat{ml}$$

where shows the correlation with children's academic outcome. From the table, I notice that pl, represents both parents leave home, increases 1 unit will increase children's grade 22.096, which means longer time parents out of home, children get higher grade. It is reverse with pervious literatures, which more time parents devote to their children, children in school age are more possible to get high grade (Hill & Stafford, 1980). But its p=0.214, is not a significant indicator.

While, ml, stands for mother out of home, is a significant indicator for children's grade, where t= -2.699 (p=0.008<0.05). With 1 unit of mother out of home, children's grade will decrease 45.566 units, which is a significant effect. What is worth mentioning is that after adding variables about situation of whether or not parents at home, the indicator fed2 (father have accepted high school education or above) becomes not significant, where p=0.25. Therefore, effect of father education on children's grade is fluctuated.

Besides, in the Table 7, I add two more variables to measure the effects of parental education, family income and peer effects on children's academic attainments by

using the data from the second sample.

Table 8

Results for regression of effects of parental education, family income and peer effects on children's final grade (based on the second sample data, n=110)

Children's final grade =

$\beta_0 + \beta_1 \text{fed1} + \beta_2 \text{fed2} + \beta_3 \text{med1} + \beta_4 \text{med2} + \beta_5 \text{tincome} + \beta_6 \text{fgrade} + \beta_7 \text{dgrade}$

	The second sample	P value
Father education level (high school or above)	-7.35 (-7.984)	0.36
Father education level (university or above)	8.331 (-9.154)	0.366
Mother education level (high school or above)	4.834 (-7.634)	0.529
Mother education level (university or above)	-4.829 (-8.418)	0.568
Total family income	0.005 (0.002) **	0.004
The friend's final grade	0.262 (0.109) **	0.019
The deskmate's final grade	0.482 (0.114) **	0.000
F Statistics	5.577	
Adjusted R-squared	0.291	

$*p<.05.$ $**p<.01.$ $***p<.001.$

After calculation, the model (3) becomes:

Children's educational attainment =

$-7.35 \widehat{fed1} + 8.331 \widehat{fed2} + 4.834 \widehat{med1} - 4.829 \widehat{med2} + 0.005 t\widehat{income} + 0.262 f\widehat{grade} + 0.482 \widehat{dgrade}$

where fgrade and dgrade represent children's friend and deskmate's final grade. Take result of Table 7, some relations should be paid attention.

First, tinome, means total annual family income, with t=2.988 (p=0.004<0.05), is a significant indicator, which tells that 1 unit increase of total family income, children's final grade will increase 0.005 units. Second, fgrade, stands for friend's final grade, with t=2.403 (p=0.019<0.05). It is a statistically significant indicator, which indicates that with 1 unit increase of friend's grade, student's academic attainments will increase 0.262 units. The last one is dgrade, represents for deakmate's final grade, with t=4.226 (p=0.000<0.05), where shows that with 1 unit increase of deskmate's final grade, students' academic outcome will increase 0.482 units.

After adding two peer effects indicator, the total family income is still positively correlated with children's academic outcomes. Meanwhile, peer effects have significant impacts on children's academic achievement. The higher score the peer get, the higher marks children get.

6. DISCUSSION

This study examined there are might links family background indicators, such as

parental education, family income and peer effects, with child academic outcome by using data from the city (Kunming) and the county (Longhui) in China. I hypothesized that these three indicators are positively correlated with children's academic result. In this paper, I do not find strong evidence that strong correlation between parental education and family income with children's academic outcome. However, there is significant relation between peer effects and children's academic outcome. Furthermore, mother caring also has positive effect on children's final grade.

Past researches have focused how parental education and family income affect children's academic outcome. The literature on achievement consistently has shown that parental education is important in improving on children's academic attainment (Hall & Willerman, 1963; Haveman & Wolfe, 1995; Bjorklund, 2004). Each extra year of education at the parental generation increases the probability of children generation staying on after post compulsory education (Chenalier, 2004). He also points out there are no significant differences in the influence of father's or mother's schooling on their children's educational achievement. On the other hand, lots of pervious researches find that high educated mother has bigger effects on children's education, compared to high educated father. Corwyn and Bradley (2002) find that maternal education has the most consistent direct influence on children's academic outcomes (cited by Pemela, 2005). In this study, I do not find that children get high score if their parents are high educated. But, for Longhui sample, I do find slight

significant effects of father's educational background on children's final grade. Father who had high school education or above (see Table 5) has positive impact on children's score, but it becomes insignificant when considering parental caring variables (see Table 7). This finding is somewhat surprising given previous (but limited) work on difference influences of father's or mother's schooling when examining determines of children's academic outcomes.

For Kunming sample, the relations of family income are related to children's academic outcome, and continued to have strong relations with grade even after considering peer effects. This pattern of results is consistent with my hypothesis that family income positively influences children's academic result. The story, however, is quite different for the Longhui sample. For this sample, family income has no impact on children's academic outcome. It is possible that parents in city are more willing to invest human capital in children, compared to parents in county.

Moreover, peer effects on children's academic result are examined in this study. Most studies emphasize peers affect children's achievement directly, for example, helping each other with course work, and also via values (Summers & Wolfe, 1977). Most people prefer friends like themselves. Jencks and Mayer find that long as schools are moderately heterogeneous, most young people can indulge this preference (cited by Zimmerman, 2003). In this study, positive peer effect on children's grade is tested. With increase of peers' grade, students' grade also increase. Furthermore, I use

friend and deskmate's total grade to indicate peer effects, and find that deskmate has deeper influence on student's grade, compared to friend.

In this study, mother caring also has an important influence on children's grade. In Longhui sample, children get lower score when their mother is not home most of time during the semester. Some theories regarding child development contend that the time mothers devote to children is crucial to children's intellectual development. The time mothers spend with children can be seen as investment into the production of child "quality" (Becker, 1991). This can help create the mechanism that facilitates the intergenerational transmission of knowledge, skills and human capital. Furthermore, some researches find that mother caring has more significant influences on children's academic performance when maternal education is higher (Halle et al 1997). This relationship is not examined in this study.

7. LIMITATION AND CONCLUDING REMARKS

7.1 Limitation

Due to limited experiences on research, the design of this questionnaire needs to be improved. Some questions are too general to define. For example, parent's occupation is divided into government officers, professionals and technical, business and services, soldier and so forth to indicate parental income. It is difficult to analysis parental

wage, because person's salary is mainly decided by the position of organization, such as CEO, manager and so on.

And during the process of conducting researches, instructions should be given in a more a careful manner. Owning to limited resources during the research conduction process, the instructions were given by teachers in schools. So the instruction and attitudes of teachers can influence the response quality of students and parents, and it has obvious difference for response from different classes. Such problems can be avoided if researchers can offer instructions directly to participants.

In addition, this research has limited measures of a person's peer group. The relationship between people and their peer group must be recognized explicitly in the model (cited by Evans, Oates & Schwab, 1992). But the real circumstances are much more complex. Most people prefer friends like themselves, even if individuals are restricted to choose friends. In this study, I choose a closed friend in the same class with the student and his/her deskmate as peer group, which just one aspect of peer group. In further study, other factors should be concerned, including the socioeconomic makeup of the school and the class.

Besides, information about family income and deskmate are one semester. The effect of current situation is small, therefore, long-term or permanent information should be collected.

7.2 Concluding Remarks

This paper investigates parental education, family income and peer effect in the determinants of children's grade. Questionnaires are made to collect basic background on parents' educational level and annual family earnings. Some findings are proved. Parental education and family income have slight effects on children's grade. There is weak correlation with father's education based on the Longhui data, and significant relation with family income for the Kunming sample. On the other hand, peer effects are significantly measured in this study. Children's score is strongly related to other students in the class. What's worth mentioning, that mother staying at home is also positively correlated to children's academic achievement.

In this study, I measure difference in children's academic result associated with situations in the city and county in China, and difference effects are found, which the effects on children from cities or rural areas can be considered in future studies.

Furthermore, in this paper, strong relation between mother at home and children's score is examined, but, how much time mother actually spend on children do not be measured, which could be concerned in future studies.

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