

# Education Expansion and Intergenerational Mobility in Rural China

LUO Chuliang  
XUE Jinjun  
GUO Lin

Based on the 2007 household survey, this paper examines the intergenerational mobility in education in rural China. The regression and decomposition analysis reveals the important contribution of education expansion on intergenerational education mobility. The parents' schooling years are instrumented by the education expansion measure at the corresponding cohorts. The Hausman test shows that endogeneity has less importance when education expansion is controlled. The findings indicate the importance of education expansion on the intergenerational education mobility.

**Keywords:** Intergenerational Education Mobility, Schooling Years, CHIP, Decomposition, Rural China

## I. Introduction

Since the economic restructure initiated at the end of the 1970s, the inequality of income distribution in China has consistently and dramatically increased for more than three decades. Concerns surrounding intergenerational mobility are also evoked by the persistence of income disparity. Lower mobility not only supports persistence of inequality but is also considered a societal injustice. Correlations between social and economic status across generations provide insights into the justice of social change and public policies. In a society with low mobility, those who benefit always take advantage, while losers are always on the losing end. Intergenerational mobility is correlated with the equality of opportunity. If the lucky and unfortunate are distributed evenly among individuals, the inequality should be less persistent.

The intergenerational mobility in education is motivated by at least two factors. First, as pointed out by Black and Devereux (2011), while education plays a crucial role in

determining earnings, it has advantages over earnings in estimating intergenerational mobility, such as fewer measurement errors. Second, intergenerational transition in human capital is important for public policy choices. Equal opportunity of education reduces the dependence of children's education on the parents' socio-economic status, which is cherished from the perspective of social justice.

There are also additional special interests on intergenerational mobility in education in rural China. In rural China, both income disparity and income mobility have increased, which may be due to the equalized opportunity of education. Education expanded sharply in rural China and such expansion may tend to increase the intergenerational mobility in education.

Though the intergenerational mobility of income in China was studied by Gong et al. (2012) and Deng and Gustaffson (2013), the literature on intergenerational mobility in education is sparse. Using the first wave survey in 1988 of China's Household Income Project, Knight and Li (1996) showed that the education of children was positively and significantly

impacted by the education of both parents, with the mother's education always being more influential. Knight, Li and Deng (2009) also found that the education of the parents significantly affected enrollment in low and high school. Knight, Terry, and Yue (2013) provided a descriptive analysis of intergenerational mobility in education in both rural and urban China using the same dataset employed in our current study. Yang and Li (2013) instrumented the father's schooling years by a dummy that indicated the father was educated during the Cultural Revolution (1966-1976) and found the likelihood of dropping out of school decreased by 30.45% in urban China for each additional schooling year of the father. The effect of family background in rural China was also studied by Sato and Li (2007).

Using the 2008 household survey, this paper examines the intergenerational mobility in education in rural China. Compared with the existing research, there are two exceptions: educational expansion is controlled in the estimation of mobility, and parents' schooling years are instrumented by the education expansion measures of their cohorts, although there is no significant difference between the OLS and IV estimator in some cases. We find the intergenerational mobility in education is high compared with the countries listed by Hertz et al. (2007), and education expansion contributes a great deal to mobility.

The remainder of the paper is structured as follows: Section 2 introduces the data used in the research, Section 3 sketches the general profile of intergenerational mobility in education, Section 4 specifies the empirical strategy, and Section 5 reports the empirical results while the last section presents the conclusion.

## II. Data description

The data used in this paper comes from the rural part in the first wave survey of Rural-Urban Migration in China conducted in 2008,

which was composed of 8000 households in 9 provinces: Hebei, Jiangsu, Zhejiang, Anhui, Henan, Hubei, Guangdong, Chongqing and Sichuan. 2007 was taken as the reference year. A detailed description of the survey can be found in Meng et al (2010).

The research on intergenerational mobility in education usually suffers from two kinds of sample selection issues, such that the complete information regarding the children-parent pairs may be less representative. The first issue is that the adult children do not always co-reside with their parents. The probability that both households of the adult children and aged parents are covered in the same survey is usually extremely low. Even if both are covered, there still remains a low probability of identifying the children-parent relationship. The second issue is related to the household registration (Hukou) system in China. Society was separated into two parts, urban and rural, by the household registration system, and the urban residents usually enjoyed better welfare than their rural excluded counterparts. Education was an important channel through which rural residents could escape from the countryside and become entitled as a member of urban society, such that the better-educated people in rural communities were less likely to stay in the sampled rural areas. As a result, the intergenerational mobility in education tends to be underestimated, if the leak caused by better-educated individuals cannot be adjusted for. Luckily, in our current research, these two selection biases are avoided in the survey design by two special modules. The first involves the parents of the household, namely, the head and the spouse. The household head and spouse were asked to recall the information about age, education, and occupation, etc., of their parents if the latter did not live together in the surveyed households. The second involves the adult children. Parents of all the adult children were also required to recall information about their children who did not co-

reside in the surveyed households.

In this paper, the sample is selected based on the following two criteria: (1) the children's ages ranged from 21 to 45 so that very few had not completed their schooling; (2) the age gap in the children-parent pairs cannot exceed 16; the father should be less than 50 years older than the children for the father-children relationship, and the mother less than 45 years older for the mother-children relationship. Individuals with missing information about schooling years and education attainment were excluded.

The descriptive information of the working sample in this paper is reported in Table 1. The total sample includes 14,474 children, of which males account for 52.09%. In China's edu-

cation system, the schooling years for primary and junior high school are generally 6 and 3 years, respectively. The average schooling years in the entire children's sample are 8.83, which indicates that the majority of the children had just finished their junior high school. In all, 57% of the children attended junior high school as their final education attainment. This percentage is higher than that of other education attainments. There is almost no difference in the mean age by gender, but the boys received more education than the girls. The average schooling years for the boys are 0.9 years higher than those for the girls. In terms of education attainments, girls made up a higher percentage of primary school education, while the relationship was reversed for the higher

**Table 1: Descriptive information on age and education**

Variable	Child		Son		Daughter	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Age	33.15	7.45	32.99	7.45	33.32	7.44
Male children(%)	52.09					
Schooling years	8.83	2.81	9.26	2.69	8.36	2.86
Education attainment (%):						
no education	0.01		0.03		0	
primary school	17.02		10.39		24.24	
junior high school	57.01		58.87		54.98	
high school	18.06		21.24		14.61	
college and above	7.90		9.48		6.17	
(# of observations)	14474		7539		6935	
Father's age	61.68	9.76	61.49	9.75	61.88	9.76
Father's schooling years	5.99	3.06	6.11	3.00	5.86	3.11
Father's education attainment (%):						
no education	9.96		8.72		11.31	
primary school	45.15		44.61		45.74	
junior high school	32.92		34.25		31.48	
high school	11.21		11.68		10.70	
college and above	0.76		0.74		0.77	
(# of observations)	14294		7433		6861	
Mother's age	60.69	10.74	60.34	10.76	61.06	10.70
Mother's schooling years	5.03	2.83	5.12	2.79	4.93	2.86
Mother's education attainment (%):						
no education	11.59		10.14		13.13	
primary school	60.77		61.37		60.13	
junior high school	22.10		22.57		21.59	
high school	5.23		5.62		4.82	
college and above	0.31		0.30		0.32	
(# of observations)	12271		6339		5932	

education attainments. With regards to the corresponding parental generation, the average age reached 60. The parents generally received less education than their children. Additionally, the father always received more education than the mother.

In Figure 1, the average schooling years of the children and parents are depicted according to the children's age. For the younger children, their schooling years and their parents are obviously higher than those for the older children. From the eldest (45 years old) to the youngest (21 years old), the average schooling years increased from 7.82 to 10.08. The generational gap is also evident for each age of the children. The line indicates the schooling years for the children lies 2 to 3 years above those of their parents. The increasing trend in schooling years across generations or ages implies that the younger children receive more education, which is consistent with the education expansion in rural China.

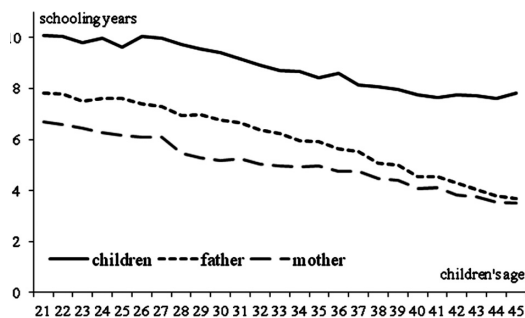


Figure 1: Children's and parents' schooling years, by children's age

### III. The profile of intergenerational mobility in education

In this section, the intergenerational mobility in education will be described in an intuitive fashion. The relationship of schooling years between children and parents is depicted in Figures 2(a) to 2(c). For each schooling year of the children, Figures 2(a) to 2(c) report the conditional average schooling years of their father or mother, respectively, while Figure 2(a)

denotes the correlation in schooling years between children and parents. The correlations are also separately reported by the children's gender in Figure 2(b) and 2(c). In each figure, the scatters are fitted linearly. All the fitted lines show a positive slope, which implies that higher schooling years of children always correlate with higher schooling years of their parents. The same relationship holds for the fathers and mothers as well as the sons and daughters. The fitted lines of the father's schooling years are always above those of the mother, which is consistent with the fact that the father always receives more education. In Figure 2(a) and 2(c), the fitted line for the fa-

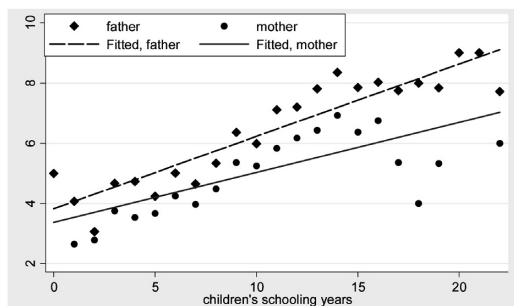


Figure 2(a): Correlation in schooling years between children and parents

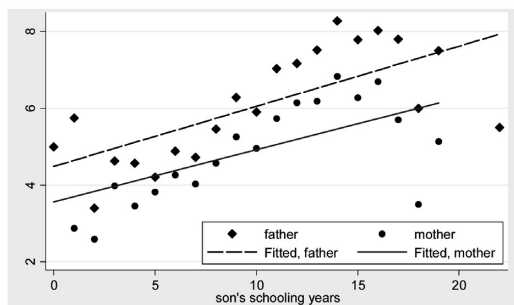


Figure 2(b): Correlation in schooling years between sons and parents

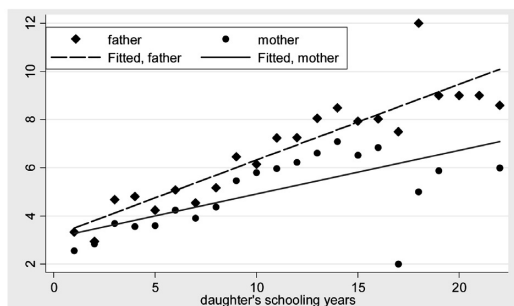


Figure 2(c): Correlation in schooling years between daughters and parents

ther's schooling years is steeper than that of the mother's. That is, the father's education usually has a stronger influence on children's schooling than does the mother's. Such phenomena may differ from current findings in the literature, which indicate that the mother's education has more influence on the children's education since the mother usually takes more responsibility for looking after the children. However, in our view, our results are reasonable because the father is the primary decision maker in the family. Figure 2(b) reveals an interesting fact with the two fitted lines being almost parallel, which intuitively implies that the mother's and father's education have an equal effect on the son's schooling years.

The first two columns in Table 2 report the correlation coefficients in schooling years between children and parents based on the children's age groups. For convenience, every

five years is categorized as a group. The correlation coefficients in schooling years between the sons and their parents are usually higher than those between the daughters and their parents. The trends of correlations in schooling years between children and parents are not obvious or deterministic. In general, the intergenerational correlation coefficients in schooling years in Table 2 are lower than those in the majority of economies as listed in Hertz et al. (2007)<sup>11</sup>.

In comparing the education attainment between children and parents, the intergenerational mobility describes the relative changes in education attainment across generations. "Up" indicates that the education attainment of children is higher than that of their father or mother, while "down" means that the education attainment of children is lower than that of their parents. In the last six columns,

**Table 2: Correlation in education between children and parents**

Age group of children	Correlation in schooling years		Changes in education attainment					
	Child-father	Child-mother	Child-father			Child-mother		
			Up	Down	Same	Up	Down	Same
Total	0.3636	0.2916	57.95	9.02	22.03	74.64	3.40	21.96
21-25	0.2211	0.2290	46.00	14.18	39.82	67.65	4.75	27.59
26-30	0.2434	0.1992	54.31	11.16	34.53	78.74	3.07	18.19
31-35	0.2750	0.1403	54.86	8.63	36.52	77.23	2.44	20.33
36-40	0.2848	0.2244	62.06	6.63	31.31	74.19	3.29	22.52
41-45	0.2182	0.1911	71.50	4.74	23.76	76.40	3.25	20.35
	Correlation in schooling years		Changes in education attainment					
	Son-father	Son-mother	Son-father			Son-mother		
			Up	Down	Same	Up	Down	Same
Total	0.3381	0.2574	61.86	7.46	30.68	78.63	2.93	18.44
21-25	0.2345	0.2153	49.40	12.30	38.29	72.53	4.15	23.32
26-30	0.2065	0.1661	55.78	9.22	35.00	80.31	2.53	17.16
31-35	0.2309	0.0934	59.73	6.73	33.55	80.69	2.26	17.04
36-40	0.2655	0.1708	67.19	5.50	27.31	78.94	3.06	18.00
41-45	0.2268	0.1934	76.96	3.34	19.70	81.42	2.46	16.11
	Correlation in schooling years		Changes in education attainment					
	Daughter-father	Daughter-mother	Daughter-father			Daughter-mother		
			Up	Down	Same	Up	Down	Same
Total	0.3829	0.3230	53.72	10.71	35.57	70.31	3.91	25.77
21-25	0.2088	0.2529	42.17	16.29	41.54	62.17	5.43	32.39
26-30	0.2775	0.2341	52.48	13.58	33.94	76.79	3.74	19.47
31-35	0.3126	0.1844	49.96	10.54	39.50	73.71	2.62	23.67
36-40	0.2884	0.2594	56.77	7.80	35.44	69.32	3.52	27.15
41-45	0.2093	0.1908	65.83	6.19	27.98	71.21	4.06	24.72

the distribution of relative changes in the children's education attainment is listed and compared with their parents. It is obvious that the "up" movement in education attainment dominates the other two cases. Very rarely, children have a lower education attainment than their parents.

The rough profile of intergenerational mobility in education described in this section implies (1) there is a positive correlation between children's and parents' education, whether measured by schooling years or education attainment; (2) the correlation is usually stronger for the children-father pairs than the children-mother pairs; (3) the descriptive results on intergenerational education mobility across age groups by children have not shown a dominant cohort profile.

## IV. Empirical strategy

### 1. Regression models

The baseline model to measure the intergenerational mobility in education attainment can be written as,

$$schyr_{child} = \alpha + \beta schyr_{fath/moth} + \theta X + \varepsilon \quad (1)$$

where  $schyr_{child}$  denotes the children's schooling years, while  $schyr_{fath/moth}$  denotes the father's or mother's schooling years. The regressed coefficient  $\beta$  measures the (im)mobility in education attainment between parents and children. Higher  $\beta$  indicates the stronger effect of parents' education on children's education attainment and lower intergenerational mobility in education.  $X$  indicates the control variables such as the children's age and gender. In our analysis, the schooling years of both parents are not incorporated simultaneously to avoid the collinearity since the correlation between the father and mother's schooling years is highly positive<sup>2)</sup>. The effects of the father's and mother's schooling years on children's schooling years are separately regressed and reported.

The baseline model is first extended to

incorporate the effects of education expansion by adding three variables on the conditional enrollment ratio of junior middle school, senior middle school and college into the regression model,

$$schyr_{child} = \alpha + \beta schyr_{fath/moth} + \delta Enroll + \theta X + \varepsilon \quad (2)$$

The aforementioned two models are estimated in OLS. The endogeneity of the parents' schooling years is suspected for several reasons, such as the unobserved ability bias (Yang and Li, 2013) and the measurement error. We instrumented them by the conditional enrollment ratios of junior high school and high school based on the parents' cohort within each county.

### 2. The measurement of education expansion

We measure the education expansion by the conditional enrollment ratios of junior high school (Chuzhong), high school (Gaozhong), and college within the cohort in the same county since the education is usually administered at the county level (Knight and Li, 1996). The cohort is defined as every five years, two years older and younger than the respondent's age. In the calculation of conditional enrollment ratios, the respondent himself was excluded in both the numerator and denominator. For example, the conditional enrollment ratio of college for age  $i$  can be calculated as the formula

$$\frac{\#college | (age \geq i-2 \& age \leq i+2)}{(\#college + \#high\ school) | (age \geq i-2 \& age \leq i+2)}$$

The conditional enrollment ratios in education attainment are used to capture the education expansion, which is comprehensively affected by both supply and demand in education. Higher conditional enrollment ratios in education attainment result from a series of possibilities, such as an increase in the provision of education, better quality of schooling, and stronger motivation in education investment. The conditional enrollment ratios for

three education attainments are depicted in Figure 3. All the three ratios increase for younger children. Since the middle 1990s, the compulsory education was extended to 9 years in rural China, the schooling years for primary and junior high school. The conditional enrollment ratio for junior high school is much higher than any other ratio and is close to 100% for the children aged 20.

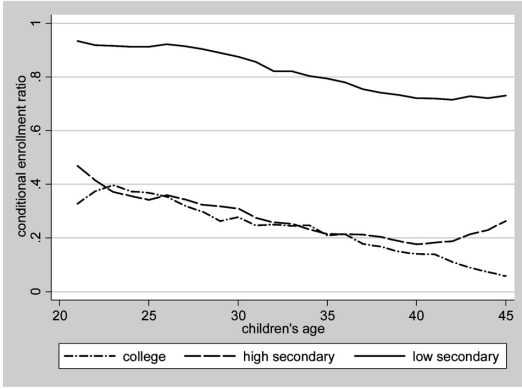


Figure 3: Education expansion with children's age, conditional enrollment ratio college, high school and junior high school

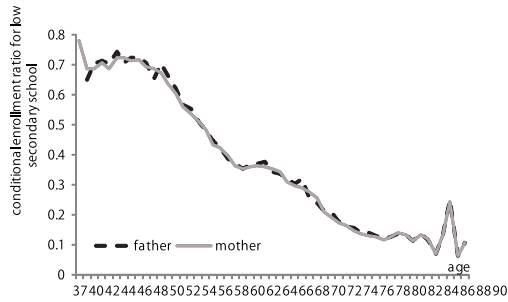


Figure 4(a): Conditional enrollment ratio for junior high school by parents' age

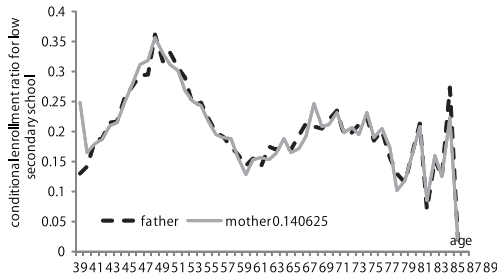


Figure 4(b): Conditional enrollment ratio for high school by parents' age

The conditional enrollment ratio in education attainment is generally determined at the

macro level. Parents' schooling years are instrumented by the conditional enrollment ratio of low and high school, which are reported in Figure 4 by the parents' age. The conditional enrollment ratios by the parents' age should have no direct effect on the children's education attainment. The ratio for junior high school is also increased in the younger individuals, while it fluctuates for high school.

### 3. Decomposition in the contributions of intergenerational mobility in education

To identify the relative contribution on the intergenerational mobility in education by parents schooling years and education expansion, we conducted the decomposition of concentration ratio based on regression. The concentration ratio of children's schooling years is ranked by their father's or mother's schooling years. A higher concentration ratio implies the children's schooling years are higher than those of the father or mother who has more schooling years, which is consistent with the idea of intergenerational mobility in education. The concentration ratios of the children's schooling years ranked by the parents' schooling years are shown in Figure 5.

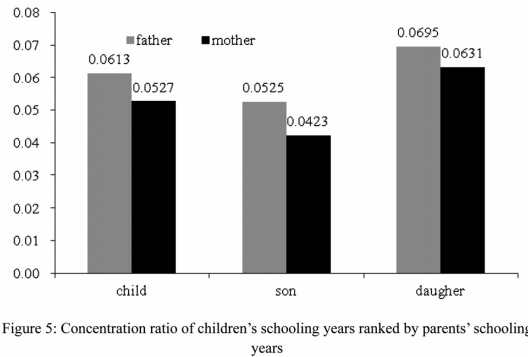


Figure 5: Concentration ratio of children's schooling years ranked by parents' schooling years

The idea of decomposition of the concentration ratio can be expressed as

$$G(\text{schyr}_{\text{fath/moth}}) = \sum_{k=1}^K \left( \frac{\beta_k \bar{x}_k}{\text{schyr}_{\text{child}}} \frac{2\text{cov}(\beta_k \bar{x}_k, F(\text{schyr}_{\text{fath/moth}}))}{\beta_k \bar{x}_k} \right) \quad (3)$$

where  $\beta_k$  is obtained from regression (2) with parents' schooling years being instrumented,  $\bar{x}_k$  is the mean value of the explanatory variable used in the regression, and  $F(schyr_{fath/moth})$  denotes the rank of  $schyr_{fath/moth}$ . In our case, the concentration ratio is decomposed into four contributors: parents' education, education expansion, other variables (gender and age effect), and unexplained effect. To avoid the zero contribution problem by constant and residual terms, we combined the constant and residual terms together as the unexplained effect.

### V. Empirical results

Table 3 and Table 4 display the regression results, with the uncontrolled or controlled

education expansion effects. The effect of the father's schooling years is listed in the upper part of each table, while the bottom part reports the results from the mother's schooling years. The gender effect on the children's schooling years is controlled not only by the gender dummy but also by the separated results of the daughter and son subsamples. In each case, both OLS and IV estimators are presented.

The estimated coefficients for both the father's and mother's schooling years are significant at the 1% level. The OLS results indicate that the children will receive approximately an additional 0.2 schooling years if the father received one more year of education. Such effects are almost equal for the daughter and son.

Table 3: Regression results, education expansion uncontrolled

	Children		Daughter		Son	
	OLS	IV	OLS	IV	OLS	IV
Father's schooling years	0.2141 [26.43]***	0.2456 [7.32]***	0.2147 [18.48]***	0.2715 [5.89]***	0.2122 [18.81]***	0.2209 [4.52]***
Age	-0.0792 [23.97]***	-0.0740 [11.58]***	-0.0979 [20.22]***	-0.0881 [9.67]***	-0.0622 [13.79]***	-0.0608 [6.78]***
Gender (male)	0.7961 [17.95]***	0.7901 [17.63]***				
Constant	9.7677 [69.68]***	9.4044 [23.43]***	10.3809 [51.45]***	9.7152 [17.34]***	10.0198 [52.79]***	9.9193 [17.04]***
N	13622	13622	6539	6539	7083	7083
F statistics	849.92	634.30	640.59	485.51	452.92	286.26
Weak identification		421.85		222.85		199.47
Over identification		0.367		1.941		0.392
Hausman test		0.93		1.62		0.03
	Children		Daughter		Son	
	OLS	IV	OLS	IV	OLS	IV
Mother's schooling years	0.1862 [20.69]***	0.3955 [9.06]***	0.2104 [16.17]***	0.4671 [7.53]***	0.1612 [12.96]***	0.3223 [5.25]***
Age	-0.0992 [29.59]***	-0.0739 [11.93]***	-0.1109 [22.50]***	-0.0780 [8.40]***	-0.0884 [19.39]***	-0.0700 [8.47]***
Gender (male)	0.7713 [16.19]***	0.7453 [15.20]***				
Constant	10.8450 [78.93]***	8.9467 [21.73]***	11.1104 [55.89]***	8.7200 [14.53]***	11.3938 [62.23]***	9.9488 [17.46]***
N	11654	11654	5629	5629	6025	6025
F statistics	740.82	598.89	572.59	441.58	387.65	309.16
Weak identification		270.78		138.80		132.56
Over identification		0.764		0.247		0.843
Hausman test		24.00***		17.93***		7.19**

Note: The absolute value t statistics are reported in [ ]; \*\*\*, \*\*, and \* denote the statistical significance at levels of 1%, 5%, and 10%, respectively.



Table 4: Regression results, education expansion controlled

	Children		Daughter		Son	
	OLS	IV	OLS	IV	OLS	IV
Father's schooling years	0.1923 [24.40]***	0.0635 [1.83]*	0.1871 [16.78]***	0.0830 [1.76]*	0.1949 [17.58]***	0.0508 [1.00]
College enrollment	0.6836 [5.82]***	0.7088 [5.97]***	0.5563 [3.29]***	0.5667 [3.33]***	0.7943 [4.89]***	0.8350 [5.07]***
High secondary enrollment	3.2858 [21.54]***	3.3374 [21.59]***	3.4168 [15.45]***	3.4566 [15.49]***	3.1236 [14.89]***	3.1823 [14.93]***
Low secondary enrollment	3.4903 [17.72]***	3.7592 [17.82]***	4.6654 [16.53]***	4.9183 [16.13]***	2.3878 [8.72]***	2.6422 [9.10]***
Children's age	-0.0052 [1.28]	-0.0230 [3.71]***	-0.0117 [2.00]**	-0.0264 [3.02]***	-0.0002 [0.04]	-0.0198 [2.26]**
Gender (male)	0.8094 [18.88]***	0.8339 [19.06]***				
Constant	3.5010 [13.43]***	4.6240 [11.71]***	2.7693 [7.46]***	3.6594 [6.77]***	5.0659 [13.99]***	6.3741 [11.01]***
N	13487	13487	6469	6469	7018	7018
F	644.97	535.67	432.81	372.12	275.48	208.82
Weak identification		374.36		194.48		180.61
Over identification		3.08*		4.45**		0.076
Hausman test		14.55**		5.17		8.50
	Children		Daughter		Son	
	OLS	IV	OLS	IV	OLS	IV
Mother's schooling years	0.1581 [17.97]***	0.1625 [3.49]***	0.1744 [13.83]***	0.2111 [3.22]***	0.1392 [11.38]***	0.1211 [1.85]*
College enrollment	0.7182 [5.57]***	0.7186 [5.58]***	0.5055 [2.75]***	0.5167 [2.79]***	0.9237 [5.13]***	0.9257 [5.14]***
High secondary enrollment	3.2571 [20.09]***	3.2548 [19.87]***	3.3960 [14.36]***	3.3739 [14.08]***	3.1216 [14.07]***	3.1297 [14.00]***
Low secondary enrollment	3.2685 [15.19]***	3.2563 [13.03]***	4.2723 [13.95]***	4.1586 [11.39]***	2.2705 [7.54]***	2.3155 [6.80]***
Children's age	-0.0261 [6.18]***	-0.0257 [4.43]***	-0.0291 [4.77]***	-0.0257 [3.00]***	-0.0242 [4.15]***	-0.0257 [3.27]***
Gender (male)	0.7635 [16.56]***	0.7630 [16.45]***				
Constant	4.7833 [17.23]***	4.7589 [12.67]***	3.9787 [10.10]***	3.7762 [7.13]***	6.4086 [16.53]***	6.5123 [12.21]***
N	11549	11549	5572	5572	5977	5977
F	552.10	500.30	368.42	331.72	238.25	212.96
Weak identification		213.18		106.72		108.08
Over identification		3.95**		3.59*		0.68
Hausman test		0.01		0.33		0.08

Note: The absolute value t statistics are reported in [ ]; \*\*\*, \*\*, and \* denote the statistical significance at levels of 1%, 5%, and 10%, respectively.

However, the effects of the mother's schooling years are different. The estimated coefficients of the mother's schooling years are much lower than that of the father's in the entire sample of children and the son subsample correspondingly. The mother's schooling years play a more important role in the daughter's

education. Better educated mothers may be more likely to diminish the preference given to the son in terms of education investment.

In Table 3, the two specification tests on instrument variables, weak identification and over identification, imply they are valid. The Hausman tests in the regression of the father's

schooling years are not significant, but the regression for the mother's schooling years is significant at the 5% level. The differences between OLS and IV estimators of the father's schooling years are not so sizeable. However, from the bottom part of Table 3, the IV estimators of the mother's schooling years are much higher than the OLS and more than doubled, which indicates that an overestimation of the intergenerational mobility in education by OLS may have occurred.

The estimated coefficients for the mother's schooling years in IV regression are also much higher than the effects of the father's. That is, the mother's schooling years are less influential on the children's education, which is consistent with current research findings. The mothers are usually more responsible for the daily care of children, while the fathers may be the main decision-makers in the household in rural China.

The other two control variables, age and gender, are always significant in the determination of the children's schooling years. The younger children receive more education, and the males receive, on average, an additional 0.7-0.8 years of education compared with their

female counterparts.

Three conditional enrollment ratios for different education attainment are controlled in Table 4 to capture the effect of education expansion. Because the Hausman tests in Table 4 were usually not significant, we mainly focused on the OLS results. The estimated coefficients of the father's and mother's schooling years were reduced, which indicates an increase in intergeneration mobility in education because of education expansion. The conditional enrollment ratios contribute to the schooling years both positively and significantly. However, the effects are decreased in higher education attainment. According to the regressions in the entire children's sample, a 1% increase in low secondary enrollment ratio contributes approximately 0.03 years of schooling, while the college enrollment ratio contributes only approximately 0.0007 years.

Based on the OLS results in Table 4, Table 5 decomposes the concentration ratio of schooling years ranked by their parents' schooling years into four contributors. According to the decomposition, the parents' schooling years are the major contributor to the intergenerational mobility in education. More than half of the

**Table 5: Relative contributions in intergenerational education mobility**

	Child-father			Child-mother		
	Share	Concentration	Contribution	Share	Concentration	Contribution
Parents' schooling years	0.1330	0.2692	0.6164	0.0912	0.2991	0.5518
Education expansion	0.4462	0.0419	0.3217	0.4264	0.0382	0.3297
Others	0.0282	0.0705	0.0342	-0.0517	-0.0915	0.0957
Unexplained	0.3926	0.0041	0.0276	0.5341	0.0021	0.0229
	daughter-father			daughter-mother		
	Share	Concentration	Contribution	Share	Concentration	Contribution
Parents' schooling years	0.1335	0.2811	0.5709	0.1039	0.3089	0.5384
Education expansion	0.5845	0.0408	0.3627	0.5419	0.0385	0.3496
Others	-0.0453	-0.0541	0.0373	-0.1131	-0.0434	0.0823
Unexplained	0.3272	0.0059	0.0291	0.4672	0.0038	0.0297
	son-father			son-mother		
	Share	Concentration	Contribution	Share	Concentration	Contribution
Parents' schooling years	0.1312	0.2582	0.6806	0.0782	0.2899	0.5768
Education expansion	0.3270	0.0441	0.2896	0.3220	0.0391	0.3206
Others	-0.0007	-0.0531	0.0008	-0.0844	-0.0401	0.0861
Unexplained	0.5425	0.0027	0.0290	0.6842	0.0009	0.0165

mobility can be explained by the inequality of the parents' schooling years. The education expansion contributes approximately one-third of the mobility. The share explained by age or gender and unexplained by the regression models is only approximately 5 or 10% for the concentration ratio of children's schooling years ranked by the father's or mother's schooling years, correspondingly.

The contributions of intergenerational mobility in education are also different between fathers and mothers and in the subsample between daughters and sons. The contribution of father's schooling years is higher than the mother's. In the entire children's sample, the father's schooling years contributes 61.64% of the concentration ratio, more than 6 percentage points higher than the mother's schooling years. In the subsample of sons, that difference reaches 10 percentage points.

The daughters benefit more from the universal expansion in education, which is implied by the higher contribution from education expansion in the subsample of daughters compared with sons. The education expansion contributes 36.27% or 34.96% of the intergenerational mobility in education in the subsample of daughters, compared with the father's and mother's schooling years, respectively, which is almost 8 and 3 percentage points higher than those in the subsample of sons. The sons usually take priority if opportunities for education are scarce.

## VI. Conclusions

Based on the 2007 household survey, we examined the intergenerational mobility in education in rural China. The findings show significant and positive effects of both parents' education on the children's schooling years. The mother's education is more influential in determining the schooling years of children, especially for the daughters, as indicated in the existing research. There are three further

additional contributions made by our current study. The first is that education expansion is controlled in the regressions of the children's schooling years. When viewed by age and generation, education expanded dramatically in rural China. This has been proven to be important both for the increase in schooling years of the children and the intergenerational mobility in education in the regression analysis. The second is that the schooling years of parents are instrumented by the education expansion of their cohorts, although in some cases the difference between the OLS and IV estimators by Hausman test is not significant. Lastly, the intergenerational mobility in education was decomposed by the inequality in the parents' schooling years and education expansion, with mobility being measured by the concentration ratio of children's schooling years ranked by their parents' schooling years. The education expansion was found to contribute approximately 30% to the intergenerational mobility in education.

The contribution of education expansion to the intergenerational mobility in education can be explained by improvement in the equal opportunity of education sourcing from the education expansion in rural China. The income mobility in rural China was also documented to be increased, which may also benefit from the high intergenerational mobility in education.

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## Notes

- 1) In this paper, the intergenerational correlation coefficient of education in rural China was calculated as 0.34, based on the *Living Standards Measurement Survey* conducted in 1995 by World Bank, which lies in the interval of correlation coefficients between rural and urban as reported in Table 2.
- 2) In the working sample, the correlation coefficient of parents schooling years is as high as 0.7621.

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(School of Economics and Business Administration, Beijing Normal University, China)

(Economic Research Center, Graduate School of Economics, Nagoya University)

(School of International Trade and Economics, University of International Business and Economics)