

Do the greater educated parents, the lower dropout rate of their children?

Luo Zukui ¹, Meng Lixia ¹, Zhu Xiufang ^{2*}

¹*School of Sports and Health Science, Kaili University, Guizhou, 556011, China*

²*School of Chemistry and Environmental Engineering, Hanjiang Normal University, Shiyang, Hubei 442000, China*

Abstract: A large number of researches presented that dropout junior middle school students had illiterate parents. In order to explore the relationships between student dropout and their parents' educated degree, we collected information of 209 students in school and 299 dropout students from 6 rural junior middle schools in southwest China. GLM model predicted that neither father educated degree ($p=0.081$), nor mother educated degree ($p=0.198$) impact on dropout differed significantly between students' genders. However, the GLM model prediction demonstrated that father educated degree ($p<0.001$), and mother educated degree ($p=0.009$) had significant negative impact on their children's schooling, the dropout students had greater educated parents. Unexpected results may be related to low employment rate of college students and educational dereliction of parents' migrant work. We put forward suggestions to prevent rural junior middle school students in southwest China from dropping out of school.

Keywords: Dropout, Parents' educated degree, Junior middle school student, Southwest China.

I. Introduction

Numerous studies have shown that educated degrees of dropout students' parents are lower. Most of dropout students have illiterate parents (Gao et al., 2018; Hossen et al., 2018). Children's educational attainment is positively correlated with their parents' educated degree (Shapiro et al. 2001). Empirical studies by Glick and Sahn (2000) found that the parents' educated degree had different impacts on sons and daughters. Their studies showed that father's education improvements raised schooling of both daughters and sons, but mother's education improvements had marked impact only on daughters. Many studies stated that reduction in mother's schooling years had a significant greater likelihood in children's dropout than that of fathers (Brown and Park, 2002; Gao and He, 2007). This is mainly because mother is not only the children's first teacher, but also generally spends more time than father in supervising, tutoring and making educational decisions during the growth of their children. Therefore, the mother's education is an important cultural source and capital for their children. An exception research result from Liang (2013) showed that there were little differences in dropout rate among student groups whose parents' educated degrees were different. Despite these isolated studies, the relationships between parents' educated levels and their children's dropout have never been comprehensively

*Corresponding author: Email: zhuxiufang@hynu.edu.cn

reported.

Over the past two decades, Chinese government has implemented series of preferential policies for rural primary and secondary schools. For example, in 2000, policies such as "tax and fee reform", "county-based management", "one fee system", and "two exemptions one subsidy" were practiced. From 2006 to 2007, the Chinese government implemented the reform of guarantee mechanism for rural compulsory education funds, exempting rural students from tuition and miscellaneous fees during the compulsory education stage (6 years of primary school and 3 years of junior middle school). In 2008, the scope of free textbooks was expanded. In 2009, accommodation fee for rural boarding students in public schools at the stage of compulsory education (primary and secondary) was abolished, and free education was realized. In 2016, China began to eradicate poverty nationwide, and implement education aid especially to the students from poverty-stricken families. Children from poverty-stricken families could enjoy free book fees, school accommodation, small loans, nutrition meal, local government scholarships, sundry fees, temporary subsidies, social donation (free stationery, sporting goods, money support, clothes, and books). However, after the implementation of these preferential policies, a large number of junior middle school students in rural middle schools still drop out (Liu, 2021; Luo et al., 2021). A common view is that the high dropout rate and poverty in remote mountainous areas of China are directly related to educational and cultural backwardness. The backwardness of education and culture leads to intergenerational transmission of poverty (Wu and Yang, 2022), which means parents' less educated levels decrease their children's schooling and form a harmful cycle.

This paper aimed to (1) explore the relationship between parents' educated degree and their children's dropout; (2) provide suggestions on dropout prevention. This empirical study is a reference in preventing students of rural Chinese junior middle schools from dropout.

II. Data Sources and Definition

Surveyed students

Our surveyed objects were students from junior middle schools (grades 7-9) in GZ Province, southwest China. GZ Province locates in a mountainous region with large areas of exposed rocks. It has become a low-income region in China due to its insufficient land resources and inconvenient transportation. GZ province was listed as one of the provinces with the largest poverty population density in China. Many local adults went away from home for migrant casual work in economically developed regions. Due to numerous ramps, students who did not board in school dormitories went to school mainly relying on foot.

Data collection

During sep. 2018- Aug. 2019, we collected students' list of spring semesters (March to July) of 5 junior middle schools of CJ County and 1 junior middle school of CH County in GZ Province. These 6 junior middle schools were all remote away from county cities and had high dropout rates for many years. Involving the confidentiality of the respondents, the specific names of the province, counties, and students were not disclosed. We collected basic information of student name, gender, age, and their parents' educated degree. Since parents' education function may lose or weaken due to dead or not staying at home (works outside or loses connection with family), we also collected data of parents' working status. Totally, information of 508 students, including 209 students in school randomly selected and all the 299 dropout students from the 6 junior middle schools, were obtained (Table 1).

Table 1. Variables definition and processing for calculation

Variables	Variable definition and assignment for categorical data
Student gender	Boy =1, girl =0
Age gap (month)	The legal school age of the local primary schools was 72 months (6 years old). The age gap (months) was the standard age (month) subtracted by the actual age (month)
Father educated degree	Junior middle school or above = 3, primary school = 2, illiterate = 1, educational function loss (father dead or lost contact with family) = 0
Mother educated degree	Junior middle school or above = 3, primary school = 2, illiterate = 1, educational function loss (father dead or lost contact with family) = 0
Father working status	Not stay at home (dead, lost contact with family, or work away from home)= 1, work at home = 0
Mother working status	Not stay at home (dead, lost contact with family, or work away from home)= 1, work at home = 0

III. Data Analysis

Data were analyzed, using Statistical Package for Social Science software SPSS 22.0 (SPSS Inc., Chicago). We used Binary Logistic Regression of Generalized Linear Models (GLM) to explore the relationship between parents' educated degree and their children's dropout, because the target variable data did not satisfied with normal distribution ($p < 0.01$; Kolmogorov-Smirnova test). In order to filter the useless variables that have ignorable impact on dropout, we carried out univariate screening before running the Binary Logistic Regression, and we precluded the variables whose significance were $p > 0.1$ in univariate regression analysis. Subsequently, we diagnosed the collinearity among the rest variables (significance $p < 0.1$ in univariate regression analysis) by Variance Inflation Factor (VIF). If the VIF of each rest variable was below 3.0, indicating no collinearity among the rest variables (Zhang et al., 2007). In calculation, students in school were assigned as 0 and dropout students were assigned as 1, respectively. When we ran the Binary Logistic Regression, independent variables of categorical type data were treated as factors and independent variables of continuous type data were treated as covariates. We analyzed interaction of the parents' working status and the educated degree, considering that they may jointly affect children's dropout.

Prior to run the Binary Logistic Regression, we standardized the predictive variables and the covariate variables by subtracting the mean and dividing by the standard deviation, ensuring predictive results more reliable.

We took use of $\alpha = 0.05$ as significant level of two-tailed probability values for statistical tests. Mean showed as $\text{mean} \pm \text{SE}$.

IV. Results

Six variables, including student gender, age gap (month), father educated degree, mother educated degree, father working status, and mother working status of 299 students in school and 209 dropout students, were obtained (Table 2).

Table 2. Variable characteristics of students in school and dropout students in GZ Province of southwest China.

Variables	Data type	Characteristic values	Standardized
Student gender	Categorical	Frequency	Yes
Students in school		f(0)=114, f(1)=185	
Dropout students		f(0)=62, f(1)=147	
Age gap(month)	Continuous	Range; Mean±SE	Yes
Students in school		[-25, 38]; 4.30±0.72	
Dropout students		[-16, 74]; 9.38±0.73	
Father educated degree	Categorical	Frequency; Mean±SE	Yes
Students in school		f(0)=25, f(1)=19, f(2)=197, f(3)=58; 1.78±0.06	
Dropout students		f(0)=21, f(1)=35, f(2)=121, f(3)=32; 1.96±0.05	
Mother educated degree	Categorical	Frequency; Mean±SE	Yes
Students in school		f(0)=28, f(1)=73, f(2)=167, f(3)=31; 1.53±0.05	
Dropout students		f(0)=11, f(1)=84, f(2)=107, f(3)=7; 1.67±0.05	
Father working status	Categorical	Frequency; Mean±SE	Yes
Students in school		f(0)=144, f(1)=155; 0.70±0.03	
Dropout students		f(0)=62, f(1)=147; 0.52±0.03	
Mother working status	Categorical	Frequency; Mean±SE	Yes
Students in school		f(0)=194, f(1)=105; 0.53±0.04	
Dropout students		f(0)=98, f(1)=111; 0.35±0.03	

Univariate regression analyses showed all variables were admitted into the Binary Logistic Regression, because all values of $p < 0.1$ (Table 3). The VIFs of each variable were all below 3.0, indicating no collinearity among the 6 variables.

Table 3. Results from univariate regression analysis for filtering the useless variables ($p > 0.1$).

Variables	β	S.E.	Wald	df	p	Exp (β)	95% CI for EXP (β)	
							Lower	Upper
Student gender	-0.38	0.19	3.87	1	0.049	0.68	0.47	1.00
Age gap (month)	0.04	0.01	20.99	1	0.000	1.04	1.02	1.06
Father educated degree	0.28	0.11	6.10	1	0.014	1.32	1.06	1.66
Mother educated degree	0.27	0.12	4.80	1	0.028	1.31	1.03	1.67
Father working status	-0.79	0.19	17.17	1	0.000	0.45	0.31	0.66
Mother working status	-0.74	0.18	16.09	1	0.000	0.48	0.33	0.69

The goodness-of-fit from the GLM showed that the reduced model fitted the data well (Pearson Chi-square: value=385.33, $df=390$, value/ $df=0.99$). The GLM predicted that student gender ($p=0.447$), mother working status ($p=0.773$), student gender*father educated degree ($p=0.081$), student gender*mother educated degree ($p=0.198$), and father educated degree*father working status ($p=0.079$) had no significant impact on student

dropout (Table 4). The GLM prediction demonstrated that the dropout students had a significant higher age gap than that of students in school ($p=0.001$; Table 2, Table 4). The father educated degree ($p<0.001$), and the mother educated degree ($p=0.009$) had significant negative impact on schooling, the dropout students had greater educated parents. More dropout students' fathers stay at home ($p=0.033$). The mother educated degree*mother working status had negative significant impact on schooling ($p=0.029$).

Table 4. Test of GLM model effects on student dropout from 6 junior middle schools in GZ Province of southwest China.

Source (Standardized)	TypeIII		
	Wald Chi-Square	df	p
Intercept	0.07	1	0.798
Student gender	0.58	1	0.447
Age gap (month)	11.30	1	0.001
Father educated degree	18.22	3	<0.001
Mother educated degree	9.53	2	0.009
Father working status	4.53	1	0.033
Mother working status	0.08	1	0.773
Student gender*Father educated degree	6.74	3	0.081
Student gender*Mother educated degree	4.66	3	0.198
Father educated degree*Father working status	6.78	3	0.079
Mother educated degree*Mother working status	7.10	2	0.029

$P<0.05$ showed in bold.

Parameters estimate from GLM model showed that the dropout student had significant higher age gap ($\beta=0.40$, $p=0.001$; Table 5). 77.93% out of the 299 dropout students were over age (age gap>0; Fig. 1), indicating older students were inclined to drop out. Compared with fathers with educated degree of junior middle school or above, fathers with educated degree of primary school ($\beta=-0.16$, $p=0.668$), and educational function loss ($\beta=0.30$, $p=0.748$) had no significant differences, but fathers with educated degree of illiterate had significant differences ($\beta=-3.22$, $p=0.007$). Compared with mothers with educated degree of junior middle school or above, mothers with educated degree of primary school ($\beta=-0.17$, $p=0.816$), illiterate ($\beta=-0.68$, $p=0.385$), and educational function loss ($\beta=-0.22$, $p=0.851$) had no significant differences, respectively. There were no significant interactions between father work at home and not stay at home ($\beta=0.28$, $p=0.660$). All interact combinations between mother's different educated degrees and different working statuses had no significant differences ($\beta=-20.36$ — 21.23 ; $p=0.682$ — 0.72).

Table 5. Parameters estimate for GLM model on student dropout from 6 junior middle schools in GZ Province of southwest China.

Parameter (Standardized)	β	SE	95%Wald CI		HypothesisTest		
			Lower	Upper	χ^2	df	p
Intercept	0.12	0.70	-1.27	1.49	0.03	1	0.871
[Student gender=0]	1.09	1.02	-0.91	3.09	1.13	1	0.287
[Student gender=1]	0 ^a						
Age gap (month)	0.40	0.12	0.16	0.63	11.30	1	0.001

[Father educated degree=0]	0.30	0.93	-1.53	2.13	0.10	1	0.748
[Father educated degree=1]	-3.22	1.20	-5.57	-0.87	7.20	1	0.007
[Father educated degree=2]	-0.16	0.37	-0.88	0.56	0.18	1	0.668
[Father educated degree=3]	0 ^a						
[Mother educated degree=0]	-0.22	1.17	-2.51	2.07	0.04	1	0.851
[Mother educated degree=1]	-0.68	0.78	-2.21	0.85	0.76	1	0.385
[Mother educated degree=2]	-0.17	0.73	-1.61	1.27	0.05	1	0.816
[Mother educated degree=3]	0 ^a						
[Father working status=0]	0.28	0.63	-0.96	1.52	0.19	1	0.660
[Father working status=1]	0 ^a						
[Mother working status=0]	21.85	50.58	-77.29	120.98	0.19	1	0.666
[Mother working status=1]	0 ^a						
[Student gender=0]*[Father educated degree=0]	-0.88	0.93	-2.71	0.95	0.89	1	0.347
[Student gender=0]*[Father educated degree=1]	0.75	0.91	-1.04	2.54	0.67	1	0.412
[Student gender=0]*[Father educated degree=2]	1.02	0.61	-0.18	2.23	2.77	1	0.096
[Student gender=0]*[Father educated degree=3]	0 ^a						
[Student gender=1]*[Father educated degree=0]	0 ^a						
[Student gender=1]*[Father educated degree=1]	0 ^a						
[Student gender=1]*[Father educated degree=2]	0 ^a						
[Student gender=1]*[Father educated degree=3]	0 ^a						
[Student gender=0]*[Mother educated degree=0]	-1.04	1.42	-3.83	1.74	0.54	1	0.463
[Student gender=0]*[Mother educated degree=1]	-1.98	1.16	-4.24	0.29	2.93	1	0.087
[Student gender=0]*[Mother educated degree=2]	-1.10	1.11	-3.28	1.09	0.97	1	0.325
[Student gender=0]*[Mother educated degree=3]	0 ^a						
[Student gender=1]*[Mother educated degree=0]	0 ^a						
[Student gender=1]*[Mother educated degree=1]	0 ^a						
[Student gender=1]*[Mother educated degree=2]	0 ^a						
[Student gender=1]*[Mother educated degree=3]	0 ^a						
[Father educated degree=0]*[Father working status=0]	-0.90	1.12	-3.09	1.29	0.65	1	0.422
[Father educated degree=0]*[Father working status=1]	0 ^a						
[Father educated degree=1]*[Father working status=0]	2.81	1.30	0.26	5.35	4.67	1	0.031
[Father educated degree=1]*[Father working status=1]	0 ^a						
[Father educated degree=2]*[Father working status=0]	0.48	0.70	-0.89	1.85	0.47	1	0.494
[Father educated degree=2]*[Father working status=1]	0 ^a						
[Father educated degree=3]*[Father working status=0]	0 ^a						

[Father educated degree=3]*[Father working status=1]	0 ^a
[Mother educated degree=0]*[Mother working status=0]	-20.36 56.83 -131.74 91.02 0.13 1 0.720
[Mother educated degree=0]*[Mother working status=1]	0 ^a
[Mother educated degree=1]*[Mother working status=0]	-20.89 48.11 -115.19 73.41 0.19 1 0.664
[Mother educated degree=1]*[Mother working status=1]	0 ^a
[Mother educated degree=2]*[Mother working status=0]	-21.23 51.77 -122.70 80.24 0.17 1 0.682
[Mother educated degree=2]*[Mother working status=1]	0 ^a
[Mother educated degree=3]*[Mother working status=0]	0 ^a
[Mother educated degree=3]*[Mother working status=1]	0 ^a

a. Set to zero because this parameter is redundant.

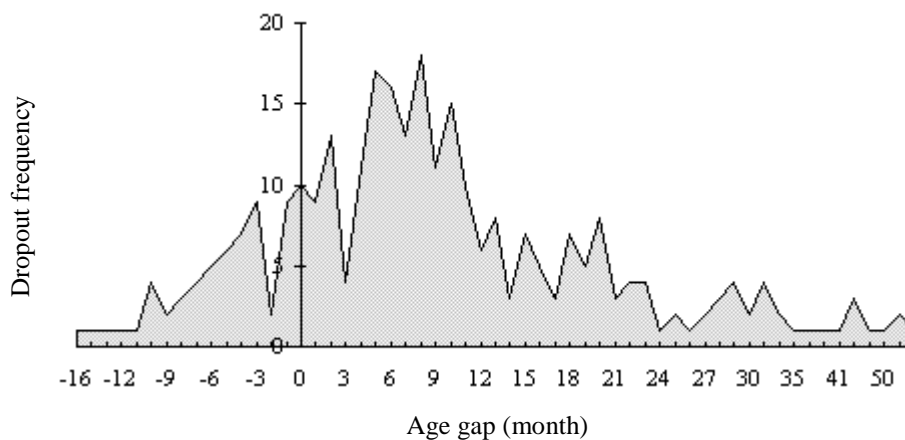


Fig 1. Age gap distribution of 299 dropout students from 6 rural junior middle schools in GZ Province of southwest China

V. Discussion

Dropout factors

Parents' educated degree and migrant work. Consistent with majority of previous studies that both mother's and father's educated degree had marked influence in their children's schooling. Contrary to majority of previous studies, our researches indicated that parental educated degrees adversely affect children's schooling. There may be the following reasons:

(1) More educated parents were easier to be employed in labor market than less educated parents, which resulted in a larger proportion of the former employed. Compared with parents staying at home (most of them were less educated) in isolated mountainous areas, parents who worked outside (most of them were more educated) were more aware that even college students could hardly find a long-term stable job at present.

Therefore, parents with more educated degree may not strongly refute their children's request to drop out of school, resulting in a trend that the higher the greater educated degree of parents, the higher the dropout rate of their children. Dropout is a decision by students and their parents, reacting naturally to avoid education investment failure (Fu, 2016).

Fathers are the image representatives of a family career in China. The career image of a father staying at home is difficult to be admired by his children, which may have a negative effect on his children's schooling. Shi and Zhao (2016) found that the impacts of parents' migrant work on their children's schooling were very complex. It might not only promote their children's schooling due to improved economic conditions, but also might accelerate their dropout because of educational reduction. Whether the parents' migrant work has impact on their children's schooling is uncertain (Su et al., 2015).

(2) In our study area, a high proportion of parents with greater educated degree were migrant workers, which may lead to duty dereliction on their children's education. The children were lack of supervision in study and might also need to take care of the elderly and younger siblings. Daily difficulties could not be solved, and psychological obstacles could not be relieved in time, which might trigger the students to drop out (Yi et al., 2012; Su et al., 2015).

Student gender and age. Several studies showed that boys had higher dropout rates than girls in China (Yi et al., 2012; Mo et al., 2013; Wang et al., 2016; Chang et al., 2016), mainly because boys were more likely to find temporary low-skill jobs in the market of labor intensive economy background (Chang et al., 2016). Nowadays, the dropout students from Chinese rural junior middle schools are willing to work out of campus, not because of family economic pressure, but lured by money and freedom (Shi and Zhao, 2016). The over age students are likely to drop out of school due to inferiority complex (Gao et al., 2018; Luo et al., 2021). Over age is mainly due to late initiation of enrollment, illness or repeating grades because of low achievers.

Suggestion on dropout prevention

In order to reduce the dropout rate of rural junior middle school students of southwest China, it is recommended to improve parents' awareness of the importance of knowledge and reduce the utilitarian intention in education. Parents should send their children to school in time when their children are at school age. At the same time, the government should strictly punish those who hire children under 16 years old, which are helpful to control dropout because of reduction of temporary employed opportunities.

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