

The Impact of Gender Differences on Years of Education

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Abstract. Gender differences in educational attainment are one of the important research topics today, some researchers have concluded that female students have a higher proportion of education than male students in different educational backgrounds. However, there is still a lack of unified explanation for the impact of various factors on gender differences in education years from the perspective of micro data analysis. Therefore, this study focuses on exploring the impact of gender differences on the length of education, using OLS regression analysis method to analyze individual questionnaires from the 2020 China Family Panel Studies and control the four dimensions of registered residence, family education investment, parents' educational background, and individual reading to analyze the gender differences between the years of education. The research conclusion is as follows: Firstly, educational inequality is still prominent between urban and rural areas, manifested as urban residents having significantly more years of education than rural residents. Secondly, gender differences have no significant impact on the length of education received. Thirdly, there are differences in the impact of annual family education investment on the education acquisition of men and women, while variables such as province, year of birth, annual reading volume, and parental education level have no significant impact on the education acquisition of men and women. This paper explores the gender differences in years of schooling through a quantitative study, which provides preliminary evidence for further insight into the factors influencing years of education.

Keywords: Gender differences, years of Education, the gap between urban and rural areas.

1. Introduction

From ancient times to the present, education has the functions of trusting career mobility and increasing income, but the education process of different groups will be disturbed by many factors, resulting in differences in the number of years of education between the two [1]. Yang Baozhong et al. found that men and women are born with differences in physiology and social labor, so that there are also differences in the number of years of education, which is manifested in the fact that men have more years of education than women [2]. However, with the effective implementation of the national policies of "educational equity" and "equality between men and women", women's right to education has been guaranteed, and the opportunities for education have increased rapidly, resulting in a situation in which the gender structure of students enrolled in general higher education has changed from "more men than women" to "more women than men" [3]. Therefore, this study aims to explore whether there are differences in the number of years of schooling between genders.

2. Methodology

Liu Wen, Yu Jia et al. used a fixed-effect model to analyze the gender differences in education investment in different family structures based on the data of the China Family Panel Studies from 2010 to 2018. The study discovered that girls received significantly lower investment in education in rural households with more traditional gender values and a stronger cultural preference for boys in their regions. In non-agricultural households with higher socioeconomic status and more equal gender values, parents invest more in girls' education [4]. Based on the 2017-2018 Chinese General Social Survey (CGSS) data, Shen Yuncong demonstrated that the 1999 university enrollment expansion policy had an impact on the number of years of education in China's rural labor force as an instrumental variable, and used the instrumental variable method to estimate the impact of education

on the feminist view of rural labor. Through regression analysis, it is detected that the increase in the number of years of education of rural residents due to the expansion of college enrollment in 1999 is more obvious than that of rural male labor, and the average number of years of education of women affected by the expansion is 3.03 years higher than that of women who are not affected by the expansion. The estimation coefficient of regression in rural males was in the same direction as that of females, but the level of significance was slightly higher than that of rural females. The increase of education level significantly increases the feminist view of rural labor force, and it is found that the feminist concept of male labor force in rural labor force is more influenced by education than that of female labor force by constructing the 2SLS model [5]. Scholars Wang Lijun, Wang Yue, and Hu Yaoling used data from the 7th National Population Census in 2020 to calculate the average number of years of education for men and women in urban and rural areas by sex and age based on the education of the national, urban, town, and rural population aged 10 to 65, a new pattern has emerged, that is, "women are higher than men are lower", and this situation is showing a trend of continuous strengthening. Combined with the perspective of effective supply matching of marriage, the study forecasted that it is more and more difficult for low-educated men to marry, while low-educated women are getting easier to marry, and more and more difficult for high-educated people to marry [6].

Except for China, research fields in other countries mainly focus on two aspects: Firstly, from the perspective of gender genetics, it is concluded that Genetic factors are not the only ones that affect gender inequality; Gender explains the relationship between multi gene scores and education level, which runs through an individual's entire life process [7]; Secondly, previous studies have mostly approached academic or career success from the perspective of analyzing the proportion of men and women who achieve this achievement, while also analyzing the proportion of educational qualifications between men and women. In the study, it was detected that even if the researchers have different races, ethnicities, or geographical locations, the number of males exceeds that of females [8].

Regarding the perspective of gender differences in education levels, current research has mostly focused on regional differences, family backgrounds and the number of siblings [4, 9, 10]. However, there is currently relatively little quantitative analysis on gender differences in educational attainment, and most of them only briefly list the reversal of the proportion of men and women in different educational backgrounds or describe the changing situation of the gap in educational attainment between men and women. Therefore, this study uses Sample data of individual questionnaires in the 2020 Chinese Family Tracking Survey to empirically test the gender differences in education attainment between men and women from multiple aspects, in order to demonstrate the degree to which each factor affects the difference in education years between men and women.

3. Research Hypothesis

Based on the reversal of the current situation where there are more female students than male students in general higher education, this study suggests that there are differences in the length of education between genders [3]. The research hypothesis of this article is that gender differences have differences in the length of education received.

4. Research Design

4.1. Research method

OLS regression analysis method.

4.2. Data sources

This study's data is sourced from a personal questionnaire from the 2020 Chinese Family Tracking Survey, exploring the impact of various dimensional factors on people's education level, therefore,

by removing missing and outliers from each dimension, this study ultimately obtained a valid sample size of 974, including 491 females and 483 males.

4.3. variable descriptions

4.3.1 Dependent variable

This study examines the education years of the respondents, therefore the completed education years of the individual questionnaire respondents in the 2020 Chinese Family Tracking Survey are used as the dependent variable.

4.3.2 Independent variable

Table 1. Variable Definition and Descriptive Statistics (Sample Size=974)

Variable	Average value	standard deviation	minimum value	Maximum value
Years of Education	11.9538	2.06446	6	22
gender	0.4958932	0.50024	0	1
Father's education years	3.991786	8.450566	1	79
Mother's education years	2.921971	3.634378	1	79
domicile	0.5205339	0.4998348	0	1
Annual reading volume	8.334702	29.12589	1	500
Every year, the family's Education investment (yuan)	11454.73	133236.12	0	153000
Beijing	0.0041068	0.0639853	0	1
Tianjin City	0.0082136	0.0903021	0	1
Hebei Province	0.0657084	0.217899	0	1
Shanxi Province	0.0482546	0.2144139	0	1
Inner Mongolia Autonomous Region	0	0	0	0
Liaoning Province	0.0513347	0.2207929	0	1
Jilin Province	0.0123203	0.1103678	0	1
Heilongjiang Province	0.0246407	0.155107	0	1
Shanghai City	0.0297741	0.1700509	0	1
Jiangsu Province	0.0174538	0.1310221	0	1
Zhejiang Province	0.0102669	0.1008562	0	1
Anhui Province	0.0164271	0.1271765	0	1
Fujian Province	0.102669	0.1008562	0	1
Jiangxi Province	0.0205339	0.1418905	0	1
Shandong Province	0.0379877	0.1912647	0	1
Henan Province	0.1273101	0.3334912	0	1
Hubei province	0.013347	0.1148147	0	1
Hunan Province	0.0156674	0.1582221	0	1
Guangdong Province	0.1047228	0.3063532	0	1
the Guangxi Zhuang Autonomous Region	0.0338809	0	0	1
Hainan	0	.1810155	0	1
Chongqing City	0	0	0	0
Sichuan	0.0051335	0.0715008	0	1
Guizhou Province	0.0523614	0.2228692	0	1
Yunnan Province	0.063655	0.2442628	0	1
Tibet Autonomous Region	0.0349076	0.1836401	0	1
Shaanxi province	0	0	0	0
Gansu Province	0.023614	0.15192102	0	1
Qinghai Province	0.1540041	0.3611381	0	1
the Ningxia Hui Autonomous Region	0	0	0	0
the Xinjiang Uygur Autonomous Region	0	0	0	0
	0.0041068	0.0639853	0	1

Based on the existing research on education equity and education access, this paper finds that most previous studies take family background and urban and rural registered residence as independent variables, therefore, this study explores the educational attainment and gender differences between men and women from four dimensions: registered residence, family education investment, parents' educational background, and personal reading. The registered residence is represented by the dummy variable of urban and rural registered residence and the dummy variable of the region where the registered residence is located; Family education investment is characterized by the educational investment amount of the respondent's family in the past year; The educational background of parents is characterized by the final years of education of the father and mother when the respondent is 14 years old; Reading volume refers to the number of books that the interviewee has read in the past year without the purpose of work or exams. (The assignment and descriptive statistical results of each variable can be seen in Table 1. Among them, the respondents have a male code of 1 and a female code of 0. The respondents with urban household registration have a code of 1, while those with rural household registration have a code of 0. The code belonging to the province or municipality directly under the central government is 1, and the code not belonging to the province or municipality directly under the central government is 0)

5. Experience Result

To explore the impact of gender differences on years of education, this study used the Least Squares (OLS) regression model to regress mixed gender samples, by means of comprehensively examining the impact of gender variables and other explanatory variables on educational attainment.

This study used Stata16.0 software to perform regression estimation on the model. Table 2 presents the stepwise regression results of gender differences in education obtained from the total sample, resulting in the following four regression models: In Model 1, only gender variables are introduced; In model 2, two control variables, urban registered residence variable and provincial variable, are added; on the basis of Model 2, Model 3 further controls for the variable of the education years of the father and mother of the respondents at the age of 14; On the basis of Model 3, Model 4 further controls for two variables: respondent reading volume and household annual education investment.

The regression results in Table 2 show that in Model 1, which only introduces gender variables, gender factors have a significant negative impact on people's education attainment, with an impact coefficient of -0.2903063, indicating that without controlling for any other factors, men's education level is about 0.29 years less than that of women. When the registered residence address is added to model 2, the regression results reveal that the coefficient value of the gender variable becomes -0.2346927, and shows no significant correlation. At the same time, it was found that the urban-rural gap has a significant impact on the level of education, with urban residents having a significantly higher education period than rural residents by 0.6105799 years. After model 3 controls the registered residence address and parents' educational background, data analysis shows that the difference of parents' educational background basically does not affect people's educational years. However, when model 4 controls the registered residence address, parents' educational background, family education investment and reading amount, the impact coefficient of gender on education acquisition becomes -0.2079517. The significance level between gender differences and years of education has not changed, and the gender variables in the following three models show no significant relationship with years of education. At the same time, analyzing the data results, it was found that there is a significant positive correlation between annual household investment and the length of education of the respondents. After controlling for a series of influencing factors, there was no significant difference in the overall education level between males and females.

Table 2. Gender Differences in Education Acquisition OLS of the Total Sample (Sample Size=974)

explanatory variable	Model 1	Model 2	Model 3,	Model 4
gender	- 0.2903063***	-0.2346927**	-0.2079517**	-0.2079517**
domicile		0.6105799****	0.4905394****	0.4905394****
Beijing		0.25*	0.2435746*	-0.5462179*
Tianjin City		-0.7400043*	-0.7506446*	-1.047205*
Hebei Province		-0.8700407*	-0.8697591*	-1.242445*
Shanxi Province		-0.4315242*	-0.423564*	-0.7111113*
Inner Mongolia Autonomous Region		0*	0*	0*
Liaoning Province		-0.8572633*	-0.8517267*	-1.398666*
Jilin Province		-0.0593673*	-0.0626673*	-0.4481385*
Heilongjiang Province		-1.023237*	-1.028171*	-1.525552*
Shanghai City		0.032081*	-0.248844*	-0.5789274*
Jiangsu Province		-0.6417482*	-0.6473439*	-1.462809*
Zhejiang Province		0.044232*	0.0485536*	-0.3312876*
Anhui Province		-0.4391916*	-0.4354305*	-0.8237276*
Fujian Province		-0.1341649*	-1.33999*	-1.596682*
Jiangxi Province		-0.1510183*	-1.505103*	-1.930623*
Shandong Province		-0.2842251*	-0.2829254*	-0.6095431*
Henan Province		-0.6897288*	-0.6846314*	-1.071071*
Hubei province		-0.3895728*	-0.3732104*	-0.5802549*
Hunan Province		0.2900084*	0.2883794*	-0.316838*
Guangdong Province		-1.021008*	-1.505103*	-4.522686*
the Guangxi Zhuang Autonomous Region		-1.082134*	-0.2829254*	-1.437289*
Hainan		0*	0*	0*
Chongqing City		0.0959401*	0.1020374*	-0.4403745*
Sichuan		-1.219665*	-1.19535*	-1.542555*
Guizhou Province		-1.311315*	-1.302479*	-1.600565*
Yunnan Province		-0.3192598*	-0.2933999*	-0.8107215*
Tibet Autonomous Region		0*	0*	0*
Shaanxi province		-0.6929037*	-0.6933277*	-1.122541*
Gansu Province		-0.8137978*	-0.8044935*	-1.205607*
Qinghai Province		0*	0*	0*
the Ningxia Hui Autonomous Region		0*	0*	0*
the Xinjiang Uygur Autonomous Region		0*	0*	0*
Father's education years			-0.0052918*	-0.00403113*
Mother's education years			0.0104574*	0.0072131*
Annual reading volume				-0.0032691*
Every year, the family's Education investment (yuan)				0.0000419****

Note: *, **, *** and **** represent significant levels of greater than 10%, 10%, 5%, and 1%, respectively.

6. Discussion

After a series of analyses, the study found that there was no significant relationship between gender and years of education, while Wu Jie, Zheng Yifang, and others found through analysis of Chinese General Social Survey data from 2008 to 2015 that gender has a significant positive impact on the length of education, with males having a higher length of education than females [1]. Therefore, the reasons for the insignificant results of this study are analyzed as follows: Firstly, in the 2020 China Family Panel Studies, some variable data may not be complete enough, and there are many missing values in the sample size of family education investment and parental education. Therefore, the sample size used for statistical analysis is not as large as the former, and the statistical analysis effect is not good. Secondly, there is no comprehensive analysis of data from many years like the former, and there is no specific exploration of the process from significant to insignificant. In addition, some factors may have been overlooked in this study, for example, the policy impact after 2015, the family class of the respondents, and the number of siblings may reduce the correlation between gender and education.

7. Conclusion

This report uses sample data from the 2020 China Family Panel Studies and uses OLS regression model to analyze the influencing factors of education access for different gender groups. The main research conclusions drawn from this article are as follows: Firstly, educational inequality still stands out between urban and rural areas, manifested by urban residents having significantly more years of education than rural residents. Secondly, gender differences have no significant impact on the length of education received. Thirdly, there are differences in the impact of annual family education investment on the education acquisition of men and women, while variables such as province, year of birth, annual reading volume, and parental education level have no significant impact on the education acquisition of men and women.

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