

# Does Husband's Education Level Affect Wife's Employment Participation? Mediation Effect Test based on CGSS

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**Keywords:** Husband's Education Level, Gross Monthly Income, Wife's Employment Participation, Mediation Effect Test, Big Data Statistics Analysis.

**Abstract:** In reality, women's employment participation is affected by various factors. Using the data of CGSS, through the micro-econometric model, we use computer statistical software—Stata, to test the effect of the husband's education level on the wife's employment participation through the mediating variable—personal gross monthly income. The study shows that: the husband's education level has a significant positive impact on his gross monthly income; only when the husband's education level is above college, the mediating effect is established, that is, only the husband has received above college education, then can positively affect wife's employment participation. In order to increase the employment participation of wives, the joint efforts of many parties are needed.

## 1 INTRODUCTION

In reality, married women's employment participation is affected by various factors (Xiang 2019). With the gradual improvement of the education level of individuals in modern society, couples are also more well-matched in education (Zheng 2020). This article takes the husband's education level as the starting point, focuses on the wife's employment participation, and uses micro-data and econometric methods to explore the relationship between the husband's education level and the wife's employment participation, then tries to answer the following questions:

First, does the husband's education level affect his personal income?

Second, does the husband's education level affect the wife's employment participation through his personal income?

The labor force participation rate of the female population in our country has always remained at a relatively high level (Zheng 2020), therefore, the employment participation of women, especially married women, has an important impact on economic development. Relying on big data, using computer statistical software to study the most basic micro-family decision-making on employment participation of cou-

ples, has important practical significance for improving labor market policies and promoting true equality between men and women.

## 2 VARIABLE SELECTION AND MODEL BUILDING

### 2.1 Data Sources

The article selects the data of the Chinese General Social Survey (CGSS) in 2015, which started in 2003 and is the earliest national, comprehensive and continuous academic survey project in China, covering 28 provinces (municipalities, autonomous Region), involving information at multiple levels such as society, community, family, and individual. The survey objects are adults over the age of 18. The total number of samples in CGSS2015 is 10,968. According to the research purpose of the article, married males were selected as the sample, and the samples with missing key variables in the survey year were excluded, then finally 2171 samples were obtained.

## 2.2 Variable Selection

### 2.2.1 Wife's Employment Participation

Wife's employment participation is the main explained variable. In CGSS2015, the question concerning wife's employment participation is: "What was the employment status of your spouse or common-law partner in the last week?" There are four options. Excluding the samples that selected items 2 and 3, items 1 and 4 are reserved as the basis for assignment of employment participation. If you select item 1 "not engaged in any work for the purpose of obtaining economic income", the wife's employment participation is assigned a value of 0; If you select the item 4 "engaged in work for the purpose of obtaining economic income (including joining the army)", then the wife's employment participation is assigned a value of 1, that is, the explained variable is a binary variable.

### 2.2.2 The Education Level of the Husband

The core explanatory variable of the article is the education level of the husband. The highest level of education (including current students) of the sample was selected as the education level of the husband, and it

was divided into seven levels, and the illiterate group was used as the control group.

### 2.2.3 Husband's Gross Monthly Income

According to the research purpose of the article, the gross monthly income (GMI) of the sample was selected as the mediating variable, which is obtained by dividing the annual total income by 12, and the logarithm of the GMI is smoothed as the mediating variable of the model.

### 2.2.4 Control Variables

In addition to the above, the article selects the sample's monthly working hours (weekly working hours\*4), age, nationality, household registration, political status, and work ownership as control variables.

## 2.3 Definition of Each Variable and Descriptive Statistics

The descriptive statistics of each variable (except for control variables) are shown in the following table 1.

Table 1. Descriptive statistics of variables

Variable	Definition and Assignment	Min	Max	Mean	Number of Samples
Wife's employment participation	Engaged in work for the purpose of obtaining economic income in the past week, assign a value of 1	0	1	0.59	1283
	Not engaged in any work for the purpose of economic income in the last week, assign a value of 0				888
Primary school	Primary school is 1; non-primary school is 0	0	1	0.22	476
Junior high school	Junior high school is 1; non-junior high school is 0	0	1	0.35	753
High school	High school is 1, including vocational high school, ordinary high school, technical secondary school and technical school; non-high school is 0	0	1	0.21	459
College	College is 1, including college (adult higher education), college (formal higher education); non-college is 0	0	1	0.08	180
Undergraduate	Undergraduate is 1, including undergraduate (adult higher education), undergraduate (formal higher education); non-undergraduate is 0	0	1	0.08	170
Postgraduate	Postgraduate or above is 1; non-postgraduate or above is 0	0	1	0.01	22
GMI log	Gross annual income/12	3.51	13.63	7.68	2171

Note: In the above table, except for the wife's employment participation in the first row, the rest of the variables are descriptive statistics of the husband's sample.

According to Table 1, among the screening samples, the employment participation rate of wives is only 59.1%, which is not particularly high. The possible reason for this situation is that the age of the wives of the sample is not specially screened, that is, a sample of all age groups that meet the conditions is selected, including retirement. The reason for this treatment is that although the current retirement age in our country is 60 years old for men and 55 years old for women, because the question is "spouse's work situation in the past week", even if the wife has retired, the short-term employment situation of returning part-time jobs is also common, so the age screening of wives is not considered here, and a sample of all ages is used.

The highest educational background of the selected sample is mainly junior high school and high school, and only 372 have received college education or above, accounting for only 17.13% of the whole sample. There are only 22 with a postgraduate degree or above, accounting for only 1%. This shows that although our country's university enrollment has been expanding, the proportion of people who have received college education or above is still relatively small, especially the shortage of high-level talents above postgraduate level.

Other control variables. The samples are mainly Han nationality, and the age group is mainly young and middle-aged; the agricultural household registration samples are mostly; the party members are few; especially the samples engaged in "good jobs within the system" in the traditional sense are few.

## 2.4 Model Building

According to the research purpose of the article and the practice of Wen Zhonglin and Ye Baojuan (2014) (Wen, Ye, 2014), the following model(1)(2)(3) are constructed for verification:

$$Work = \alpha_0 + \beta_0 Education + \gamma_0 X_0 + \mu_0 \quad (1)$$

$$Y = \alpha_1 + \beta_1 Education + \gamma_1 X_1 + \mu_1 \quad (2)$$

$$Work = \alpha_2 + \beta_2 Education + \delta Y + \gamma_2 X_2 + \mu_2 \quad (3)$$

According to model (1)(2)(3), *Work* represents the employment participation of the wife, which is the explained variable, and is a binary variable; *Y* represents the mediating variable, the GMI of the husband (logarithmic form), *Education* represents the explanatory variable--the education level of the husband, which is a multi-category variable;  $X_i$  represents the control variable.  $\beta_i, \gamma_i, \delta$  are parameters to

be estimated,  $\mu_i$  is random error term, and  $\alpha_i$  is a constant term.

Wen Zhonglin and Ye Baojuan (2014) (Wen, Ye, 2014) pointed out that the mediation effect test should be tested in sequence first, that is, for the above model, if at least one of  $\beta_1$  and  $\delta$  is found to be insignificant, the Sobel test is required. If both  $\beta_1$  and  $\delta$  are significant, the result of the sequential test is stronger than that of the Bootstrap method. Therefore, the standards for judging the mediation effect of the above model are: the explained variable *Work* has a regression on the explanatory variable *Education*, and the coefficient  $\beta_0$  is significant; the mediating variable *Y* has a regression on the explanatory variable *Education*, the explained variable *Work* has a regression on the mediating variable *Y* and the explanatory variable *Education*, if the coefficients  $\beta_1$  and  $\delta$  are both significant, it means that there is a mediating effect.

## 3 METHODS: ECONOMETRIC TEST OF THE MEDIATION EFFECT

According to the above-mentioned mediation effect test method, this paper intends to use Stata to test the significance of the regression coefficients of the constructed models respectively. Stata is a set of computer statistics software that relies on big data to analyze data, manage data, and draw professional charts for users. Stata is powerful and a very convenient computer software.

### 3.1 A Test of the Effect of Husband's Education Level on Wife's Employment Participation

Use binary logistic regression to test the significance of the regression coefficients of the model (1). The regression results are as follows (Table 2):

Table 2. Logistic regression results of model (1)

Explanatory Variable	Coefficient	Standard Error	Explanatory Variable	Coefficient	Standard Error
Primary school	-0.367* (2.827)	0.218	Age	-0.015*** (12.708)	0.004
Junior high school	-0.342 (2.446)	0.219	Nationality	-0.240 (2.045)	0.168
High school	-0.160 (0.465)	0.235	Household registration	-0.032 (0.073)	0.118
College	0.494* (2.945)	0.288	Political status	-0.187 (1.770)	0.141
Undergraduate	0.738** (5.869)	0.304	Ownership	-0.303** (4.749)	0.139
Postgraduate	1.419** (4.431)	0.674	Constant	1.299*** (11.678)	0.380
Monthly working hours	0.001** (3.822)	0.001	Hosmer and Lemeshow test		0.375

Note: The data in parentheses are wals values, \*\*\*, \*\*, \* indicate significance at the 1%, 5%, and 10% confidence levels, respectively.

For the Hosmer and Lemeshow test of the above binary logistic regression, the P value is 0.375>0.05, indicating that the model (1) has a good fit. The regression results show that, for the education level of the husband, primary school, college, undergraduate and postgraduate all have a significant impact on the wife's employment participation. The difference is that the education level of the sample with primary school has a significant negative impact on the wife's employment participation; while the education level of the sample of college, undergraduate and postgraduate students has a significant positive impact on the wife's employment participation, and the higher the husband's education level, the greater the impact on the wife's employment participation.

For the remaining control variables, the husband's monthly working time has a significant positive im-

act on the wife's employment participation. However, the increase of the husband's age will have a significant negative impact on the wife's employment participation. The ownership of the husband's work also has a negative impact on the wife's employment participation. Finally, the husband's nationality and household registration have no significant effect on the wife's employment participation.

### 3.2 A Test of the Effect of Husband's Education Level on Husband's GMI

Apply multiple regression analysis to test the significance of the regression coefficients of the model (2). The regression results are as follows (Table 3):

Table 3. Multiple regression results of model (2)

Explanatory Variable	Coefficient	Standard Error	Explanatory Variable	Coefficient	Standard Error
Primary School	0.151 (1.562)	0.097	Age	-0.024*** (-12.592)	0.002
Junior high school	0.557*** (5.750)	0.097	Nationality	0.486*** (6.705)	0.073
High school	0.786*** (7.570)	0.104	Household registration	0.395*** (7.722)	0.051
College	1.054*** (8.536)	0.123	Political status	0.042 (0.688)	0.061
Undergraduate	1.317*** (10.286)	0.128	Ownership	0.034 (0.568)	0.060
Postgraduate	1.629*** (7.302)	0.223	Constant	7.402*** (44.509)	0.166
Monthly working hours	0.001*** (3.827)	0.000	Adjust R <sup>2</sup>		0.352

Note: The data in parentheses are t values, \*\*\*, \*\*, \* indicate significance at the 1%, 5%, and 10% confidence levels, respectively.

The above regression results show that, except for primary school, the husband's education level has a significant positive impact on the husband's GMI, and the higher the education level, the greater the impact on the GMI. For example, compared with the illiterate sample, the sample with a high school education has a 78.6% increase in GMI, while the sample with a college education, the value is 105.4%, and at the post-graduate level, the value rises to 162.9%, it can be seen that higher education level especially above graduate level has a great impact on GMI.

For other control variables, the effect of monthly working hours on GMI is positive, The effect of age on GMI is negative. Compared with the minorities, the GMI of the Han nationality is higher; the sample

income of the non-agricultural household registration is higher than that of the agricultural household registration, which is consistent with the actual situation. Finally, The effect of political status and ownership on GMI is not significant.

### 3.3 A Test of the Effect of Husband's Education Level and GMI on Wife's Employment Participation

Use binary logistic regression to test the significance of the regression coefficients of the model (3). The regression results are as follows (Table 4):

Table 4. Logistic regression results of model (3)

Explanatory Variable	Coefficient	Standard Error	Explanatory Variable	Coefficient	Standard Error
Primary school	-0.354 (2.630)	0.218	Monthly working hours	0.001** (4.418)	0.001
Junior high school	-0.294 (1.781)	0.220	Age	-0.017*** (15.335)	0.004
High school	-0.092 (0.150)	0.238	Nationality	-0.197 (1.342)	0.170
College	0.586** (4.019)	0.292	Household registration	0.004 (0.001)	0.120
Undergraduate	0.853** (7.520)	0.311	Political status	-0.183 (1.689)	0.141
Postgraduate	1.561** (5.297)	0.678	Ownership	-0.299** (4.604)	0.139
GMI log	-0.089* (3.270)	0.049	Constant	1.962*** (13.747)	0.529
Hosmer and Lemeshow test	0.895				

Note: The data in parentheses are wals values, \*\*\*, \*\*, \* indicate significance at the 1%, 5%, and 10% confidence levels, respectively.

It can be seen from the above table that the P value of the Hosmer and Lemeshow test is  $0.895 > 0.05$ , indicating that the model (3) has a good fit. The core explanatory variable--the husband's education level, has a significant positive impact on the wife's employment participation above the college, and the higher the education level, the greater the impact, which is consistent with the regression results of model (1). The core explanatory variable logarithm of husband's GMI has a significant negative impact on wife's employment participation.

For other control variables, both husband's age and work ownership have significant negative effects on wife's employment participation; while household registration and political status have no significant effects on wife's employment participation.

To sum up, if the education level of the husband is in three stages: college, undergraduate and post-graduate, the regression results of the above three models are: the explanated variable *Work* has a regression on the explanatory variable *Education*, and the coefficient  $\beta_0$  is significant; the mediator variable *Y* has a regression on the explanatory variable *Education*, the coefficient  $\beta_1$  is significant; the explanated variable *Work* is regressed on the mediating variable *Y* and the explanatory variable *Education*, and  $\delta$  is significant, so according to the sequential test method of the mediating effect, it can be seen that the mediating effect of the husband's GMI exists, that is, the husband's education level can affect the wife's employment participation through the mediating variable of the husband's GMI, and the



husband's education level has a significant positive impact on the wife's employment participation.

#### 4 CONCLUSIONS AND SUGGESTIONS

Relying on big data and using Stata computer statistical software to complete the mediation effect test, we can draw the following conclusions: only when the husband's education level is above college, the GMI of the mediating variable can positively affect the wife's employment participation.

Based on the further discussion above, in order to increase the wife's employment participation, the following suggestions are put forward:

Increase investment in education. In modern society, the employment participation of wives is not only related to their own level of education, but also has a significant positive correlation with their husbands' education level. Therefore, in order to improve the employment participation of women, the fundamental is to improve the education level of the whole people, especially to increase the investment in education at the college level and above. Although our country has expanded its higher education enrollment since 2000, compared with developed countries, the proportion of people with higher education in our country is still small, and even fewer have received postgraduate education. Relevant data from the official website of the Ministry of Education shows that in 2021, the number of ordinary undergraduates and college graduates was 8.265 million. There are 10.013 million enrollments and 34.961 million students in school (Ministry of Education, 2021), and even fewer postgraduate students. However, the total number of people in our country in 2021 is about 1.41 billion. It can be seen that our country's higher education investment needs to be further improved.

Destroy gender social norms. In addition to educational level, women's employment participation is effected by a variety of factors. One of the most important points is the social norms of gender. The traditional gender social norm advocates that "men take charge of the outside, and females take care of the inside", When roles conflict with the work, based on the theory of gender dominance, women should give up the work and return to their families (Cheng, He, 2017). However, with the progress of society, The concept of equality between men and women is gradually recognized. In the workplace, the government, society and enterprises should try their best to elimi-

nate the "glass ceiling" for women's career advancement, break down barriers to women's professional title promotion, and create a good working space for women; in the family, it is necessary to advocate the sharing of housework by husbands and wives, free women's productivity from housework, etc., then promote women's employment participation, especially married women.

This research was supported by a project of social science research of Shandong Youth University of Political Science (Grant No.: SJYBXM202212)

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