

The Impact of Gender on the Happiness of Middle-Aged and Elderly People in Rural Areas of China: Based on the Empirical Analysis of CHARLS (2018) Data

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Abstract. The well-being of individuals is a crucial focal point and fundamental objective within the realm of social development. By examining a dataset comprising 16,593 micro-level records from the CHARLS database and employing the mesomeric effect model, the following conclusions are deduced: (1) The happiness levels of middle-aged and elderly women residing in rural regions of China are lower compared to men; (2) Gender exerts an influence on the happiness of middle-aged and elderly individuals in rural areas through mediating factors marital status and personal income; (3) Among the middle-aged and elderly population in rural areas of China, their level of education, perceived health status, number of family members, and frequency of contact with children can impact their overall sense of happiness.

Keywords: Gender; Happiness; Rural Areas; Middle-Aged and Elderly Population.

1. Introduction

Happiness is a key aspiration of human society, and its measurement is crucial for the governing Party and the state. The World Happiness Report 2022 ranks China 72nd with a score of 5.585, indicating room for improvement. With a significant rural population, China's reliance on agriculture is notable. Rural residents accounted for 36.11% of the total population (507.979 million individuals) according to the 2021 National Population Census. Given the aging trend, investigating the happiness of middle-aged and elderly individuals in rural areas is crucial for social well-being and a fair social security system.

Incorporating gender dynamics into the study of rural residents' happiness bears supplementary research significance from both academic and practical standpoints. Academically, it broadens the scope of domestic research, while practically, it underscores the need to pay attention to the happiness of individuals at the micro level within the context of rural revitalization.

The academic community in China has already conducted extensive research on factors influencing the happiness of rural residents, encompassing economic status, social security, environmental governance, internet usage, and cultural consumption. Subjective well-being is typically measured using two primary methods. One method, used by Cohen and Kuruger, involves identifying factors influencing happiness through individual assessments and aggregating the results. The other method, the self-report scale method, is simpler and more accurate. In China, most studies assign happiness levels based on respondents' own scoring, aligning with data processing methods employed by CGSS, CFPS, and CHARLS, thereby validating the reliability of this approach. This article, consistent with prior research, utilizes data from the CHARLS survey where respondents actively assigned values to measure happiness.

However, research on gender and well-being in China remains inadequate, with only Li Lei's (2017) study and research on gender identity and well-being among college students serving as representative examples[5-6]. Research findings indicate that gender-based happiness disparities are not solely attributable to observable factors like income, education, or marital status, but rather to unobservable factors. Additional studies suggest that gender discrimination-related social pressures in China contribute to these differences.

In contrast, studies on the impact of gender on happiness are prevalent abroad, with works by Fujita, Diener, and Sandvik (1991), Diener, Oishi, and Lucas (2003), Meisenberg and Woodley

(2015), J. Joško Brakus (2022), and others considering various factors such as region, culture, occupation, and encompassing differentiation studies between rural and urban areas.

However, foreign research holds limited reference significance for China due to two primary reasons. Firstly, happiness serves as a crucial psychological indicator of an individual's successful adaptation to society [7], tightly intertwined with social and cultural factors. Secondly, notable cultural disparities exist between the East and the West. The West values individualism, emphasizing traits such as independence, agency, and assertiveness, which are predominantly associated with masculinity (The concept of "masculinity" mentioned here, as well as the "femininity" mentioned later, can be referred to the authoritative Western research on gender characteristics, such as Cook E.P.'s study on Psychological Androgyny published by Pergamon Press Inc in 1985, pages 70-125.). Conversely, the East values collectivism, highlighting interdependence, communality, and harmonious relationships, typically associated with femininity [8-11]. Consequently, social and cultural identities of different genders vary between the East and the West, influencing individuals' assessments of their societal adaptation, namely their sense of happiness.

While numerous studies have explored the applicability of gender role models in China, the information derived from these studies remains relatively rudimentary. Methodological deficiencies significantly compromise the reliability of their results. Moreover, the interpretation and contextualization of these findings lack global significance, impeding a comprehensive exploration of their value from the perspective of cross-cultural comparisons between the East and the West.

2. Theoretical Analysis and Research Hypotheses

Previous studies both domestically and internationally have confirmed the existence of gender differences in happiness. However, gender factors have not been extensively studied in relation to the happiness of middle-aged and elderly individuals in rural areas of China. While regional variations in gender differences in happiness have been observed, factors influencing happiness such as marriage, age, and gender discrimination are cross-regional. Based on comprehensive analysis, the following hypothesis is proposed.

Hypothesis 1: There is a gender difference in the happiness of middle-aged and elderly people in rural areas of China.

In terms of marital happiness, the academic community has long explored the "gender role hypothesis" and the concept of "marriage dividends" (greater benefits for men in marriage). Recent domestic research has increasingly focused on gender-based variations in marital happiness. Liu Yuping and Guo Junjun (2015) conducted quantitative analysis and confirmed the significant influence of gender on marital happiness among Chinese residents. The "Blue Book of Social Psychology: China's Social Psychology Research Report 2019" also highlighted notable gender differences in marital satisfaction, with males generally reporting higher levels of satisfaction than females. While the CHARLS questionnaire does not directly capture respondents' evaluations of marital happiness, we can utilize a substitute variable. Middle-aged and elderly individuals, who are more likely to experience marital changes and consider remarriage, assess their marital happiness when making such decisions. Therefore, marital status can serve as a substitute variable, leading to the formulation of the following hypothesis.

Hypothesis 2: Marital status serves as a mediating variable in the impact of gender on the happiness of middle-aged and elderly individuals in rural areas of China.

Gender differences also exist in personal income in rural areas. Existing research points to two main reasons for these disparities. Firstly, there are gender differences in non-agricultural employment among rural laborers in China. Studies indicate that China lacks a comparative advantage in bulk agricultural product production, particularly with the increase in grain imports leading to decreased grain prices and farmers' income in major grain-producing areas. Consequently, rural laborers are motivated to seek non-agricultural employment to compensate for the decline in agricultural income. However, the likelihood of female rural laborers engaging in non-agricultural

employment is significantly lower than that of male laborers, resulting in gender differences in individual income in rural areas. The second reason is gender differences in agricultural labor. Globally, women's roles in the agricultural and food system tend to be marginalized, with more women engaged in informal, part-time, low-skilled, and labor-intensive jobs. The income of women involved in paid agricultural work is 82% of that of men (news.un.org). The correlation between personal income and happiness has been established in multiple studies, leading to the proposal of the following hypothesis.

Hypothesis 3: Personal Income serves as a mediating variable in the impact of gender on the happiness of middle-aged and elderly individuals in rural areas of China.

In addition to marital status and personal income, various factors can significantly impact the happiness of middle-aged and elderly individuals residing in rural areas. Health status is a crucial factor that cannot be overlooked, as evidenced by studies conducted by Tang Dan et al. (2006). Education level is another influential factor, as indicated by research conducted by Jiang Yali (2019). Family size has been identified as a significant factor affecting happiness, as demonstrated by the study conducted by Yan Jing (2013). Additionally, the frequency of interaction with children has been found to play a role in happiness, as explored by Li Yue and Cui Hongzhi (2014). These factors are captured by variables in the CHARLS survey, including education level, perceived self-health status, number of family members, and frequency of contact with children. Some of these variables have undergone arithmetic processing, which will be further elucidated. Based on these considerations, the following hypothesis is proposed.

Hypothesis 4: Individual education level, perceived health status, number of family members, and frequency of contact with children significantly influence the sense of happiness among the middle-aged and elderly population in rural areas of China.

3. Research Designs

(1) Data Source

The empirical data for this study were obtained from the 2018 China Health and Retirement Longitudinal Study (CHARLS) survey conducted by Peking University. The CHARLS survey, covering a broad geographical range including 150 counties and 450 communities across 28 provinces, autonomous regions, and municipalities in China, provided the latest available data. The survey sample comprised 19,000 respondents from 12,400 households, specifically targeting individuals aged 45 years and above who are middle-aged and elderly. After excluding data that did not meet the criteria and lacked key variable values, a total of 16,593 valid samples were obtained from the initial pool of 19,744 samples.

(2) Model Design

To examine the mediating role of marital status and personal income in the relationship between gender and well-being among middle-aged and elderly individuals in rural areas.

The mesomeric effect model encompasses four distinct models, as follows (The mediation effect model was examined using various methods, and in this study, the Bootstrap sampling method (Bradley Efron, 1979) was employed for testing.).

$$lsa = \alpha_0 + \alpha_1 gen + \sum_{i=1}^n \alpha_i X_i \tag{1}$$

$$mar = \beta_0 + \beta_1 gen + \sum_{i=1}^n \beta_i X_i \tag{2}$$

$$lna = \gamma_0 + \gamma_1 gen + \sum_{i=1}^n \gamma_i X_i \tag{3}$$

$$lsa = \delta_0 + \delta_1 gen + \delta_2 mar + \delta_3 lna + \sum_{i=1}^n \delta_i X_i \tag{4}$$

In the proposed model, various control variables X_i are included, and constant terms α_0 , β_0 , γ_0 and δ_0 are utilized.

Model (1) serves to validate Hypothesis 1 and Hypothesis 4. Models (2), (3), and (4) are employed to validate Hypothesis 2 and Hypothesis 3.

Thus, the proportion of indirect effects of the explanatory variable *gen* on the dependent variable, mediated by the mediating variable *mar*, is represented as $\beta_1 \cdot \delta_2 / \alpha_1$. Similarly, the proportion of indirect effects on the dependent variable through the mediating variable *lna* is $\gamma_1 \cdot \delta_3 / \alpha_1$, and the proportion of direct effects is denoted as δ_1 / α_1 .

Table 1. Variable Description and Descriptive Statistics

	Variables	Meaning	Explanation	Description	percentage or numerical value
Mediating variables	<i>mar</i>	Marital status	unmarried or not living with spouse=0 Married living with spouse=1	0	20.5%
				1	79.5%
	<i>lna</i>	Logarithm of individual annual income	Taking the Natural Logarithm of Individual Annual Income	Average Value	6.0207
				Standard Deviation	4.19051
Control variables	<i>edu</i>	Education level	No formal education (Illiterate) = 1 Incomplete primary education = 2 Graduated from Sishu = 3 Graduated from primary school = 4 Graduated from junior high school = 5 Graduated from high school = 6 Graduated from vocational school (including teacher training and vocational high school) = 7 Graduated from junior college = 8 Graduated from undergraduate program = 9 Graduated from master's program = 10 Graduated from doctoral program = 11	1	22.8%
				2	20.5%
				3	0.3%
				4	22.2%
				5	21.7%
				6	8.1%
				7	2.4%
				8	1.3%
				9	0.7%
				10	0.1%
				11	0%
	<i>per</i>	Perceived health status	Very good = 1 Good = 2 Average = 3 Not good = 4 Very not good = 5	1	12.2%
				2	12.8%
				3	49.1%
4				20%	
5				5.9%	
<i>num</i>	Number of family members	Based on respondents' answers	Average Value	2.07489	
			Standard Deviation	3.04764	
<i>fre</i>	Frequency of contact with children	Almost every day = 1 2-3 times per week = 2 Once a week = 3 Once every half month = 4 Once a month = 5 Once every three months = 6 Once every six months = 7 Once a year = 8 Almost never = 9	1	4.7%	
			2	10.2%	
			3	24.6%	
			4	28.2%	
			5	23.6%	
			6	5.9%	
			7	1.7%	
			8	0.9%	
			9	0.2%	

Note: Sishu: Sishu refers to a folk-based early childhood education institution established within households, clans, or rural communities in ancient Chinese society.

(3) Description of Variables

The computation process of certain variables involves issues related to value range, such as the calculation of personal annual income which includes wage income as one of its sources. When respondents are unable to provide specific numerical values due to memory issues or other reasons, CHARLS automatically expands the question to inquire about the minimum (min) and maximum (max) values for that particular variable. To address the issue of variable values with value range, this study employed the method of taking the average value. Firstly, after excluding data where the initial response variable values and min/max variable values were simultaneously missing, the missing variable values were replaced with 0. Thus, the true variable value was computed as the initial response variable value + $\frac{\text{min}+\text{max}}{2}$. Since the CHARLS questionnaire mechanism stipulates that respondents will not be further asked about the numerical range after providing a specific value, cases of repetitive summation can be eliminated.

Explanatory variable: Life satisfaction. Psychologically, happiness is a crucial indicator of an individual's societal adaptation (Huang Xuanfeng et al., 2008). In the CHARLS database, life satisfaction is employed as the variable for measuring happiness. This study directly quotes the CHARLS questionnaire's definition of life satisfaction, which includes response options ranging from extremely satisfied (=1) to not at all satisfied (=5).

Explanatory variable: Gender. Female individuals are assigned a value of 0, while male individuals are assigned a value of 1.

Mediating variables and Control Variables are described in table 1.

4. Empirical Results and Analysis

(1) The Verification of Hypothesis 1 and Hypothesis 4

The test results of Model (1) are presented in Table 2.

Table 2. Test Results of Model (1)

	<i>lsa</i>
constant	2.712**
<i>gen</i>	-0.050**
<i>edu</i>	0.003
<i>per</i>	0.018**
<i>num</i>	0.226*
<i>fre</i>	0.462**

* p<0.05 ** p<0.01

Based on the test results in Table 2, for Model (1), the total effect of the explanatory variable *gen* on the dependent variable is -0.050 (significant at the 1% level). This indicates that, on average, male residents in rural areas have a life satisfaction level that is 0.05 higher than female residents in rural areas, thus confirming Hypothesis 1.

Furthermore, the regression results for the control variables in the table also support Hypothesis 4. The coefficient for the control variable *edu* is 0.003 with a p-value of 0.327, indicating a relatively low level of significance. However, in real-life scenarios, educational level has a noticeable effect on life satisfaction. Descriptive statistics reveal that the research sample has a relatively low level of education, with 87.4% not completing high school and less than 1% holding a bachelor's degree or higher. Considering the concentration of the data, a significance requirement of 32.7% for this variable is acceptable.

(2) The Verification of Hypothesis 2 and Hypothesis 3

The test results of Model (2), Model (3) and Model (4) are presented in Table 3.

For model (2), the explanatory variable *gen* has a significant effect of 0.083 (at a 1% significance level) on the mediating variable *mar*. This confirms Hypothesis 2. The control variables have negligible impact.

For model (3), the explanatory variable *gen* has a significant effect of 1.435 (at a 1% significance level) on the mediating variable *lna*, suggesting that male residents in rural areas have higher annual incomes than female residents. This supports Hypothesis 3.

Table 3. Test Results of Model(2), Model(3) and Model(4)

	<i>mar</i>	<i>lna</i>	<i>lsa</i>
<i>constant</i>	0.758**	5.257**	2.845**
<i>gen</i>	0.083**	1.435**	-0.027*
<i>mar</i>			-0.112**
<i>lna</i>			-0.009**
<i>edu</i>	0.003*	0.147**	0.005
<i>per</i>	-0.005	-0.141**	0.017**
<i>num</i>	0.001*	0.005	0.274**
<i>fre</i>	0.003*	-0.002	0.392**

* p<0.05 ** p<0.01

For model (4), the explanatory variable *gen* has a direct effect of -0.027 (at a 1% significance level) on the dependent variable. The mediating variables *mar* and *lna* have direct effects of -0.112 (at a 1% significance level) and -0.009 (at a 1% significance level), respectively, suggesting that being married and cohabiting with a spouse and having a higher income level are advantageous for individuals in terms of adopting a positive attitude towards life.

Based on the comprehensive analysis above, the mediating effects of the explanatory variable *gen* on the dependent variable *lsa* through the mediating variables 'mar' and 'lna' are presented in Table 4.

Table 4. Summary of the mediation effects

Mediation Pathway	Test Results	c	a*b	c'	Formula	Proportion of the Mediation Effect
		Total Effect	Mediation Effect	Direct Effect		
<i>gen=>mar=>lsa</i>	partial mediation	-0.05	-0.009	-0.027	$a * b / c$	18.85%
<i>gen=>lna=>lsa</i>	partial mediation	-0.05	-0.013	-0.027	$a * b / c$	26.48%

The proportion of the mediation effect of marital status is 18.85%, and the proportion of the mediation effect of personal annual income is 26.48%. This means that approximately 19% of the impact of gender on life satisfaction among rural residents can be explained by marital status, and approximately 26% can be explained by personal annual income.

From the empirical results, it can be observed that the mediating variables collectively explain approximately 45% of the impact of gender on the well-being of the rural elderly population. It should be noted that unobservable factors cannot be overlooked in the influencing factors of well-being and are not discussed here.

(3) Test of Endogeneity

To address potential endogeneity issues among the variables and obtain a reliable mediation effect model, ordinary least squares (OLS) regression analysis was conducted to examine the correlations between the gender variable *gen* and the control variables *edu*, *per*, *num* and *fre*. The regression results are presented in Table 5.

Based on Table 5, it can be observed that there is no significant correlation, in statistical terms, between the explanatory variable *gen* and the control variables. Therefore, there is no issue of collinearity. Hence, the mediation effect model has passed the endogeneity test.

Table 5. Test Results of Endogeneity

	<i>gen</i>
<i>edu</i>	-0.002(p>0.75)
<i>per</i>	0.019(p>0.30)
<i>num</i>	-0.007(p>0.85)
<i>fre</i>	0.020(p>0.65)

Furthermore, the endogeneity test also confirms that gender cannot be considered as a mediating variable influencing the happiness of the sample through variables such as educational level, perceived health status, family size, and frequency of contact with children. This validates the appropriateness of the control variables.

5. Conclusion

The aforementioned research findings indicate that the happiness levels of middle-aged and elderly women in rural areas of China are lower compared to men, primarily due to the income gap and marital status of the female population. Therefore, it is of great significance to narrow the gender gap in income and improve the marital status of women in order to enhance the overall happiness of the rural elderly population.

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