

The Impact of "Reverse Feedback" on Elderly Labor Participation

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Abstract: This article is based on the 2018 China Health and Elderly Care Tracking Survey (CHARLS) data and uses the Logit model and propensity score matching method (PSM) to estimate the impact of "reverse feeding" behavior on elderly labor participation. Research has shown that providing financial support to children by elderly parents can encourage them to enter the labor market; The behavior of intergenerational care will inhibit their entry into the labor market; Providing economic support for children is more significant for elderly individuals living alone and men, while the negative impact of intergenerational care is more significant among women and elderly people living with their children. Therefore, it is necessary to further optimize the supply and service of early childhood care resources, protect the rights and interests of women to participate in labor, and improve the elderly care security system to build a scientific and reasonable elderly employment security system.

Keywords: Reverse feedback, Economic support, Intergenerational care, Labor participation.

1. Introduction

With the development of the economy and social progress, the problem of aging population in China is becoming increasingly serious. According to the seventh population census report of the National Bureau of Statistics, as of the end of 2020, the population of elderly people aged 60 and above in China exceeded 264 million, accounting for 18.7% of the national population. Among them, the proportion of elderly people aged 65 and above reached 13.5%. Compared with the sixth population census, the population aged 60 and above increased by 5.44 percentage points, and the population aged 65 and above increased by 4.63 percentage points[1]. The situation of population aging is extremely severe and constantly deepening, which will bring a series of serious consequences such as a decrease in the total labor force and labor participation rate, an increase in the burden of elderly care, and a significant increase in social security expenditures. As one of the earliest developing countries in the world to enter an aging society, China's aging problem has become a challenge that we must face. In response to the labor shortage caused by the aging population, China has proposed a gradual delayed retirement policy and continuously optimized the birth policy. The implementation of the delayed retirement policy can alleviate the shortage of labor supply and greatly promote the elderly to have a better future, which is an important manifestation of the active aging strategy. In the long run, fully relaxing the policy of having three children and encouraging the implementation of childbirth policies can optimize the population structure and reserve talents for the future labor market. However, most women of childbearing age in China are in an upward period of career development, and giving birth again will make them face the dilemma of employment and returning to their families. Therefore, elderly people usually take the initiative to take care of their grandchildren. In the long run, delaying retirement and optimizing birth policies are important measures to alleviate population aging and promote sustained and healthy development of the national economy. However, there is also a contradiction and conflict point that elderly people need to

make a choice between entering the labor market and intergenerational family support[2].

2. Literature Review

Foreign scholars have conducted relatively early research on intergenerational support theory, which roughly includes three aspects: meaning, mode, and motivation. Intergenerational support refers to the process in which family members provide help to each other in different forms to achieve Utility maximization problem of the family[3]. It includes two different directions: the previous generation supports the next generation and the next generation supports the previous generation[4]. Fei Xiaotong (1983) pointed out that the intergenerational support of Chinese families is mainly manifested in two aspects, namely, the feedback mode of "parents support their children, and children support their parents"; The intergenerational support in the West is mainly manifested in the "relay model", which refers to the process of parents raising their children, and the children also raising their children[5]. In terms of intergenerational support, it mainly includes three aspects: economic support, life care, and emotional support[6]. However, some scholars have also proposed dividing it from the dimensions of total time exchange, total monetary and physical support[7]. Based on the principle of reciprocity, some scholars believe that elderly parents hope to obtain financial support from their children by providing care for their grandchildren[8]. However, there are also studies that show that parents who provide various intergenerational support to their children tend to have Altruism motives of no return as a whole[9]. Different scholars have proposed their own perspectives on the motivation of intergenerational support, laying a solid theoretical foundation for current research.

In recent years, there has been a gradual increase in research on the participation of elderly people in labor, especially in terms of the influencing factors of elderly labor participation. The labor participation of the elderly is influenced by multiple factors from three levels: individual, family, and society[10]. The research content at the individual

level mainly focuses on education level and health status, and the labor participation rate of middle-aged and elderly people with high education level is significantly higher than that of middle-aged and elderly people with low education level[11]. However, some scholars have found that the employment willingness of elderly people who graduate from high school is higher than that of elderly people who graduate from university[12]. There is a significant positive correlation between health status and labor participation of the elderly, and deteriorating health status will have a negative impact on labor participation of the elderly, with age, gender, and urban-rural differences[13]. The impact of family factors on elderly labor participation is mainly manifested in three aspects: family structure, family consumption level, and intergenerational support[14], and intergenerational support is the focus of this article's research. In terms of social characteristics, some scholars believe that participating in pension insurance can significantly promote the labor participation of rural elderly people, while the level of pension will have a negative impact on rural elderly labor participation[15]. Some scholars have found that the "new rural social security" has reduced the participation rate of rural elderly people in agricultural labor[16], but its impact is not long-term sustainable[17]. In addition, some studies based on comparative analysis between Brazil and India have found that poverty is the direct cause of elderly people's participation in labor[18], and the elderly group mainly enters the labor market to maintain their livelihoods. KudinsJ (2021) also proposed a similar viewpoint, stating that the participation of elderly people in labor in Latvia is not a manifestation of active aging, but rather an increase in income through employment, thereby overcoming poverty[19].

The impact of intergenerational support on labor participation mainly revolves around economic support and intergenerational care, but existing research has some controversy. Most scholars believe that providing financial support to children will encourage elderly people to re-enter the labor market, and obtaining financial support from children will have a negative impact on their labor participation[20]. However, some scholars have explored the labor participation behavior of young and elderly people in Chengdu and come up with opposite views, which can be attributed to the particularity of the group of young and retired elderly people[21]. Meanwhile, some scholars have found that children's economic support can inhibit rural elderly people from engaging in agricultural labor, but it will not have an impact on non agricultural labor participation; Providing financial support to their children by elderly parents will encourage them to participate in various labor activities[22]. In terms of intergenerational care, most studies have explored the impact of intergenerational care on the labor participation of young women, and believe that intergenerational care for the elderly can significantly increase the labor participation rate of young women[23]. Meanwhile, scholars have analyzed the impact of intergenerational care on children's labor participation time based on differences in employment sectors, and found that in the non agricultural sector, intergenerational care behavior only has a positive impact on women's labor participation time; In the agricultural sector, intergenerational care has a positive impact on both male and female labor participation time[24]. When exploring the impact of intergenerational care on elderly labor participation, scholars have drawn different conclusions. Some scholars have found that caring for grandchildren can have a negative

impact on the labor participation rate and time of elderly people[25], while others believe that intergenerational care can promote elderly labor participation[26].

In summary, domestic and foreign scholars have conducted relatively rich research on labor participation issues, but by comparing existing literature, it is found that there are still some shortcomings in the relevant research on elderly labor participation. Firstly, existing research mostly focuses on the impact of personal characteristics of the elderly, such as gender, age, education level, and health status, on their labor participation in the elderly, lacking specific analysis of individual factors in family characteristics. Secondly, the dimensions of intergenerational support mostly focus on the intergenerational backfeeding behavior of children supporting their parents, while there is relatively little research on the "intergenerational backfeeding" behavior of parents towards their children. In addition, domestic and foreign research mostly focuses on the beneficiaries of intergenerational care, exploring the impact of intergenerational care on the labor participation of young women, while to some extent neglecting its impact on the labor participation of intergenerational care providers (elderly parents). Therefore, this article analyzes the impact of intergenerational economic support and intergenerational care behavior on elderly labor participation from the perspective of "reverse feeding", achieving a change in research perspective. Considering the differences in gender and residential arrangements, heterogeneity analysis is used to further explore the impact of "reverse feeding" behavior on elderly labor participation.

3. Data Sources, Variable Definitions, And Econometric Models

3.1. Data source

The data in this article is sourced from the 2018 China Health and Elderly Care Tracking Survey (CHARLS), which covers micro data empirical analysis and discussion of households and individuals of middle-aged and elderly people aged 45 and above in China. It covers 28 provinces, 150 counties, 450 villages, and over 10000 households across the country, with over 20000 respondents. To explore the impact of "reverse feedback" on elderly labor participation, this article mainly uses relevant data from six sections in the CHARLS2018 database: "personal basic information", "family information", "family communication and economic assistance", "health status and functions", "personal income and assets", and "work and retirement". Selecting elderly people aged 60-79 as the research subjects of this article, after cleaning, matching, and removing missing values, the final effective sample size was 5445.

3.2. Variable definition

The dependent variable of this article is elderly labor participation, which refers to the behavior of respondents directly participating in paid economic labor. According to the questionnaire, 'Have you engaged in agricultural production and operation activities for more than 10 days in the past year', 'Have you earned money for other farmers or hired backbone agricultural work for at least 10 days in the past year' Did you work for at least one hour last week? "And" Are you currently on temporary leave, sick leave, or on-the-job training, but able to return to your original job position within 6 months? "Are used to determine the labor participation status of the elderly.

As long as one of the above conditions is met, the value is assigned to 1, otherwise it is assigned to 0.

The explanatory variable of this article is "reverse feeding", which mainly includes two aspects, namely providing economic support to children and providing intergenerational care. Based on the questions in the questionnaire, "How much financial support did you or your spouse provide to your children when they did not live with you in the past year?" and "Did you or your spouse spend time taking care of your grandchildren and grandchildren in the past year. The question of how much financial support to give to children is treated as a discrete variable from a continuous variable, that is, 'whether to give financial support to children'. If 'yes', it is assigned a value of 1, and if 'no', it is assigned a value of 0. For intergenerational care, assign the answer option 'Yes' to 1, indicating that the elderly provide intergenerational care for

their grandchildren. Assign the answer option 'No' to 0, indicating that the elderly do not have intergenerational care for their grandchildren.

In the control variables of this article, personal characteristics, family characteristics, and social characteristics were considered. Personal characteristics include age, gender, marital status, education level, self-assessment of health status, and whether one has chronic diseases; Family characteristics examine five aspects: whether children provide emotional support to their parents, their work status, whether they live with their children, their physical condition, and retirement income; Social characteristics include two aspects: whether to actively engage in social interaction and whether to go online. The definition of variables and descriptive statistics are shown in Table 1.

Table 1. Descriptive Statistics of Main Variables

variable	Variable Definition	mean value	standard deviation	minimum value	Maximum value
Elderly labor participation	Yes=1, No=0	0.5327	0.4990	0	1
Do parents provide financial support to their children	Yes=1, No=0	0.4022	0.4904	0	1
Do parents provide intergenerational care to their grandchildren	Yes=1, No=0	0.4314	0.4953	0	1
age	continuous variable	68.0995	5.3303	60	79
gender	Male=1, Female=0	0.5026	0.5000	0	1
marital status	Married and cohabiting with spouse=1, other situations=0	0.6729	0.4692	0	1
Education level	Uneducated=0, incomplete primary/private school/primary school=1, middle/high school/technical secondary school=2, college/undergraduate/master's degree=3	0.9986	0.7538	0	3
Self assessment of health status	Bad=0, Generally=1, good=2	0.8871	0.7194	0	2
Are you suffering from chronic diseases	Yes=1, No=0	0.4883	0.4999	0	1
Emotional support	Score situation (continuous variable)	12.0534	8.3876	0	70
Work status of children	Yes=1, No=0	0.9822	0.1324	0	1
Do parents live with their children	Yes=1, No=0	0.5345	0.4989	0	1
Child's physical condition	Bad=0, Generally=1, good=2	1.6371	0.5146	0	2
retirement income	Continuous variable (logarithmic)	6.2541	3.4662	0	13.0036
social interaction	Yes=1, No=0	0.4620	0.4986	0	1
Whether to go online	Yes=1, No=0	0.0657	0.2478	0	1

3.3. Econometrics model

Since the explained variable of this paper is a two Categorical variable, this paper selects a binary Logit regression model to estimate the impact of "reverse feeding" on the participation of the elderly in labor. The specific form of the Logit model is as follows:

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \sum_{i=0}^k \beta_i x_i + \varepsilon \quad (1)$$

Among them, β_0 is a constant term, k is the number of explanatory variables, x_i is an independent variable (the explanatory variables in this article include economic support, intergenerational care, and control variables), β_i is the regression coefficient of the explanatory variable, and ε represents the influence of other factors on the elderly labor participation of the dependent variable, that is, the random error term.

In addition, whether the surveyed elderly participate in

labor may not meet the conditions for random sampling, but rather a process of independent selection and decision-making based on personal characteristics. Elderly people who choose to provide financial support to their children or provide intergenerational care to their grandchildren may have a higher personal income level and a certain amount of economic savings; Elderly people who do not provide financial support to their children or provide intergenerational care to their grandchildren may have unstable income and lack the ability to provide downward intergenerational support. This will lead to selective bias, which will lead to endogenous problems. Therefore, this paper uses the propensity score matching method to further analyze the impact of the elderly who do not provide "reverse feedback" on their labor participation. Through "counterfactual" inference, it compares with the elderly who have observed "reverse feedback", so as to obtain a consistent estimate of the Average treatment effect (ATT). The calculation formula for ATT is as follows:

$$ATT = E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 1) \quad (2)$$

In equation (2), Y_{1i} represents the participation of elderly people who have undergone "reverse feedback" in labor work, and Y_{0i} represents the participation of elderly people who have not undergone "reverse feedback" in labor work in the intervention group. Because Y_{0i} cannot be directly observed, a counterfactual framework needs to be constructed for $E(Y_{0i}|D_i = 1)$, which is to observe the value of ATT, which is the net effect of counterfactual inference.

4. Empirical Analysis

4.1. Benchmark model regression analysis

The benchmark regression of this article is shown in Table 2. This article uses the Logit model as the benchmark regression model, and adds personal characteristics to column (1). It is found that gender, age, marital status, and other factors have a significant impact on elderly labor participation, all of which are significant at a 99% confidence level. Column (2) added control variables of family characteristics to explore the impact of providing economic support to children on elderly labor participation. The results showed that providing

economic support to children can significantly improve elderly labor participation. After adding social characteristics to column (3), the positive impact of providing economic support to children remains significant at the 1% statistical level. Column (4) incorporates personal characteristics to explore the impact of providing intergenerational care to grandchildren on elderly labor participation. The results show that providing intergenerational care to grandchildren is significant at a 99% confidence level, and the coefficient value is negative, indicating that providing intergenerational care to grandchildren significantly reduces elderly labor participation. After adding the control variables of family characteristics and social characteristics to columns (5) and (6), the impact of providing intergenerational care to grandchildren on elderly labor participation still exists. These results indicate that, compared to elderly people who do not provide intergenerational economic support to their children, providing economic assistance to their children can significantly promote elderly labor participation; Compared to elderly people who do not provide intergenerational care to their grandchildren in their daily lives, providing intergenerational care to their grandchildren significantly inhibits elderly labor participation to some extent.

Table 2. Quantitative estimation results of "reverse feedback" on elderly labor participation

	(1)	(2)	(3)	(4)	(5)	(6)
Provide financial support to children	0.1894*** (0.0618)	0.2378*** (0.0637)	0.2668*** (0.0642)			
Providing intergenerational care for grandchildren				-0.1979*** (0.0614)	-0.1574** (0.0630)	-0.1424** (0.0634)
age	-0.0952*** (0.0059)	-0.0822*** (0.0065)	-0.0857*** (0.0065)	-0.0986*** (0.0060)	-0.0875*** (0.0066)	-0.0906*** (0.0066)
gender	0.8003*** (0.0662)	0.7917*** (0.0676)	0.7790*** (0.0681)	0.7994*** (0.0642)	0.7894*** (0.0656)	0.7780*** (0.0661)
marital status	0.2854*** (0.0671)	0.3321*** (0.0689)	0.3287*** (0.0691)	0.2918*** (0.0652)	0.3364*** (0.0670)	0.3375*** (0.0673)
Education level	-0.5239*** (0.0449)	-0.4644*** (0.0464)	-0.3940*** (0.0477)	-0.5263*** (0.0431)	-0.4592*** (0.0448)	-0.3882*** (0.0460)
Self assessment of health status	0.2448*** (0.0430)	0.2647*** (0.0453)	0.2915*** (0.0457)	0.2474*** (0.0418)	0.2708*** (0.0441)	0.2979*** (0.0445)
Are you suffering from chronic diseases	-0.3164*** (0.0607)	-0.2925*** (0.0618)	-0.2718*** (0.0622)	-0.3192*** (0.0591)	-0.2900*** (0.0603)	-0.2702*** (0.0606)
Emotional support		-0.0092** (0.0040)	-0.0097** (0.0041)		-0.0054 (0.0038)	-0.0060 (0.0038)
Work status of children		0.9453*** (0.2481)	0.9292*** (0.2500)		0.8651*** (0.2290)	0.8622*** (0.2306)
Do parents live with their children		-0.1631*** (0.0615)	-0.1674*** (0.0618)		-0.1926*** (0.0597)	-0.1959*** (0.0600)
Child's physical condition		-0.0261 (0.0620)	-0.0098 (0.0623)		-0.0273 (0.0599)	-0.0130 (0.0602)
retirement income (Take logarithm)		-0.0867*** (0.0094)	-0.0811*** (0.0095)		-0.0849*** (0.0091)	-0.0787*** (0.0091)
social interaction			-0.1362** (0.0623)			-0.1057* (0.0605)
Whether to go online			-0.8326*** (0.1349)			-0.8283*** (0.1286)
Constant term	6.4642*** (0.4197)	5.2052*** (0.5030)	5.5049*** (0.5073)	6.8333*** (0.4329)	5.8245*** (0.5035)	5.9855*** (0.5066)
sample size	5182	5109	5109	5445	5360	5360
R ²	0.0863	0.1026	0.1093	0.0852	0.1013	0.1078

Note: * P<0.1, ** P<0.05, *** P<0.01. The robustness standard error is shown in parentheses, and the table below is the same.

The age variables in Table 2 are significantly negative at the 1% statistical level, indicating that as age increases, the

willingness of the elderly to participate in labor decreases; Gender is significantly positive at the 1% statistical level,

Table 3. Self selection processing of "reverse feedback"

	category	treatment group	control group	ATT value	error	t-values
nearest-neighbor matching	Before matching	0.5721	0.5242	0.0480	0.0142	3.39***
	After matching	0.5730	0.5203	0.0527	0.0140	3.21***
Radius matching	Before matching	0.5721	0.5242	0.0480	0.0142	3.39***
	After matching	0.5730	0.5272	0.0458	0.0149	3.08***
kernel matching	Before matching	0.5721	0.5242	0.0480	0.0142	3.39***
	After matching	0.5730	0.5256	0.0474	0.0150	3.16***

Table 4. Deviation Reduction before and after Matching of Various Variables

variable	sample	mean value		Standard deviation (%)	Error reduction (%)	T—test	
		Test group	control group			t	p> t
age	Before matching	67.658	68.42	-14.5	88.1	-5.09	0.000
	After matching	67.667	67.576	1.7			
gender	Before matching	0.528	0.486	8.3	95.8	2.91	0.004
	After matching	0.528	0.530	-0.3			
marital status	Before matching	0.747	0.642	22.9	95.0	7.97	0.000
	After matching	0.746	0.752	-1.1			
Education level	Before matching	1.139	0.899	32.4	91.5	11.43	0.000
	After matching	1.136	1.116	2.8			
Self assessment of health status	Before matching	0.955	0.831	17.4	97.1	6.10	0.000
	After matching	0.953	0.957	-0.5			
Are you suffering from chronic diseases	Before matching	0.498	0.475	4.6	70.1	1.62	0.106
	After matching	0.497	0.490	1.4			
retirement income (Take logarithm)	Before matching	12.805	12.518	3.6	89.5	1.25	0.212
	After matching	12.815	12.785	0.4			
social interaction	Before matching	0.985	0.984	0.4	89.2	0.16	0.876
	After matching	0.985	0.985	0.0			
Whether to go online	Before matching	0.447	0.557	-22.2	95.8	-7.79	0.000
	After matching	0.448	0.453	-0.9			
Self assessment of health status	Before matching	1.695	1.611	16.7	100.0	5.82	0.000
	After matching	1.694	1.694	0.0			
Are you suffering from chronic diseases	Before matching	6.713	5.877	24.3	90.1	8.58	0.000
	After matching	6.704	6.621	2.4			
Emotional support	Before matching	0.528	0.423	21.2	98.8	7.47	0.000
	After matching	0.527	0.526	0.3			
Work status of children	Before matching	0.095	0.042	21.2	87.2	7.71	0.000
	After matching	0.093	0.086	2.7			
Do parents live with their children	Before matching	0.528	0.423	21.2	98.8	7.47	0.000
	After matching	0.527	0.526	0.3			
Child's physical condition	Before matching	0.095	0.042	21.2	87.2	7.71	0.000
	After matching	0.093	0.086	2.7			
retirement income (Take logarithm)	Before matching	0.095	0.042	21.2	87.2	7.71	0.000
	After matching	0.093	0.086	2.7			
social interaction	Before matching	0.095	0.042	21.2	87.2	7.71	0.000
	After matching	0.093	0.086	2.7			
Whether to go online	Before matching	0.095	0.042	21.2	87.2	7.71	0.000
	After matching	0.093	0.086	2.7			

indicating that elderly men have a stronger willingness to participate in labor than women; Marital status indicates that people who are married and cohabiting with their spouse are more willing to participate in labor; Educational variables show that older people with lower levels of education are more inclined to participate in labor; The better the self rated health status of the elderly, the more it can promote their participation in labor; Elderly people suffering from chronic diseases can inhibit their participation in labor.

The variable of children's work status shows that the more children have work, the more it can promote the labor participation of the elderly; Whether to live with children is significantly negative at the 1% statistical level, indicating that parents living with children will inhibit their participation in labor. This may be because elderly parents need to fulfill their responsibility to take care of their grandchildren, resulting in a decrease in their time participating in labor; The data in the table shows that the physical condition of children has no impact on elderly labor participation; Retirement income is significant at a 99% confidence level, and the coefficient value is negative, indicating that elderly people with higher retirement income have weaker willingness to work; Internet access variables show that regular access to the Internet will reduce the probability of labor participation of the elderly. Generally, we believe that the use of the Internet by the elderly can help them to obtain work information, but the Internet also has social, entertainment and other purposes, which will have a Substitution effect on labor participation of the elderly, thus hindering the elderly from working to a certain extent.

The propensity score matching requires a sample balance

test, which requires that there should be no systematic differences between the treatment group and the control group after matching. As shown in Table 4, the vast majority of variables have significant P-values before matching, while P-values after matching are not significant. Moreover, the standardized deviation of the matched samples has been reduced to less than 10%, indicating that the sample deviation has been largely eliminated.

4.2. Robust Test

Due to the fact that whether to engage in "reverse feeding" is the result of elderly people's self selection, there is a problem of selective bias. This article further uses the propensity score matching method (PSM) for robustness testing to prevent bias in the analysis direction. From Table 3, it can be seen that the ATT value of radius matching after matching is 0.0458, and it is significant at the 1% statistical level, that is, "reverse feeding" can significantly increase elderly labor participation by 4.58%. At the same time, the T-values of nearest neighbor matching and kernel matching before and after matching are significant at the 1% statistical level, verifying the good robustness of the estimation results.

The balance test of the matching results in Table 5 shows that the pseudo R2 estimated by Logit is 0.000 after matching, indicating that the sample's effect on "reverse feeding" is significantly reduced after correcting for selectivity bias through propensity score matching. That is, the elderly's "reverse feeding" selection meets the conditional random hypothesis after matching, proving the feasibility of the propensity score matching method based on counterfactuals.

Table 5. Balance test of matching results

sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B
Before matching	0.051	351.48	0.000	16.1	17.4	54.3*
After matching	0.000	2.37	0.999	1.1	0.9	4.8

4.3. Heterogeneity analysis

The labor participation of the elderly is influenced by different factors and exhibits significant heterogeneity. This article examines the heterogeneous impact of "reverse feeding" on elderly labor participation from two aspects: gender and whether they live with their children.

4.3.1. Heterogeneity Analysis of Economic Support for Children

As shown in Table 6, grouping regression based on the gender of the elderly shows that there is a certain gender difference. For male elderly people, providing financial support to their children is significantly positive at a 99% confidence level for their labor participation; For female

elderly people, providing financial support to their children is significantly positive at a 95% confidence level for their labor participation, indicating that providing financial support to their children has a stronger promoting effect on male elderly people's labor participation. The regression results of whether to live with children or not show that providing economic support to children can significantly promote the participation of elderly people who live separately from their children in labor, but has no impact on the participation of elderly people living together in the labor market. The possible reason is that elderly people living alone are more independent in terms of economy and life, and have more time and energy to realize their own value through labor participation.

Table 6. Heterogeneity analysis of providing economic support for children

	gender		Whether to live with children	
	male	female	cohabit	Different residences
Provide financial support to children	0.3242*** (0.0918)	0.2117** (0.0903)	0.1479 (0.0905)	0.3984*** (0.0922)
control variable	Controlled	Controlled	Controlled	Controlled
Pseudo R ²	0.1043	0.0900	0.0995	0.1239
sample size	2570	2539	2617	2492

4.3.2. Heterogeneity analysis of intergenerational care for grandchildren

From Table 7, it can be seen that providing intergenerational care for grandchildren significantly suppressed the participation of female elderly people in labor at a statistical level of 1%, while it did not affect the participation of male elderly people in labor. The reason for this phenomenon may be related to traditional family division of labor, which generally involves women handling internal

affairs and taking care of grandchildren, so there is not enough time for labor. Grouped by whether or not they live with their children, providing intergenerational care to grandchildren significantly inhibits labor participation at a 1% level for elderly people living with their children, while providing care to grandchildren has no effect on elderly people living alone. This may be because elderly people living with their children spend relatively more time caring for their grandchildren, which has a crowding out effect on their participation in the labor market.

Table 7. Heterogeneity analysis of providing intergenerational care for grandchildren

	gender		Whether to live with children	
	male	female	cohabit	Different residences
Providing intergenerational care for grandchildren control variable	-0.0090 (0.0899)	-0.2708*** (0.0900)	-0.2274*** (0.0873)	-0.0465 (0.0930)
Pseudo R ²	Controlled 0.1001	Controlled 0.0926	Controlled 0.1013	Controlled 0.1178
sample size	2708	2652	2851	2509

5. Conclusions and Recommendations

Research has found that, firstly, providing intergenerational economic support for children can significantly enhance elderly labor participation. Secondly, providing intergenerational care for grandchildren can inhibit elderly labor participation. Thirdly, heterogeneity analysis shows that "reverse feeding" has significant differences in elderly labor participation, with a greater negative impact on the labor supply of female elderly people and a more significant promoting effect on elderly people with different children.

Based on the above empirical conclusions, this article proposes the following four suggestions: firstly, optimize the supply and service of early childhood care resources to alleviate the pressure of intergenerational care for the elderly. The low participation rate in elderly labor is largely due to the fact that caring for grandchildren takes up a significant amount of their time. Therefore, efforts should be made to address the issue of family care for the elderly. The government should improve the market access mechanism for childcare services[27], improve relevant laws and regulations, and formulate corresponding detailed rules based on the situation in different regions, provide preferential assistance and incentive policies for relevant industries, and promote the development of childcare services in various regions while ensuring quality. At the same time, market entities should combine their own advantages, deeply explore resources, and explore various forms of childcare services based on the diverse and personalized needs of customer groups.

Secondly, balance the burden of family care and ensure the rights and interests of women to participate in labor. Influenced by the traditional idea of "men leading the outside, women leading the inside", it has largely resulted in a situation where women take on the responsibility for family care. On the one hand, government departments should formulate and improve laws and regulations on the participation of female elderly people in labor, allowing willing and capable female groups to participate in the labor market and shine in their fields of expertise. On the other hand, male groups should be encouraged to actively participate in family care, share some of the pressure with women, and give

them time and energy to participate in labor.

Thirdly, improve the elderly care security system to ensure the participation of elderly labor. Due to the influence of the concept of "raising children to prevent aging", most elderly people choose the former when facing conflicts between family care and labor participation. Therefore, on the one hand, it is necessary to change the misconception of treating the elderly as a vulnerable group from an ideological perspective, and reshape the correct values of the elderly in participating in labor. On the other hand, we need to implement the elderly care security policy, improve the social welfare level of the elderly group, establish multi-functional maintenance institutions based on communities, ensure that "the elderly have a place to take care of, and have a place to rely on", thus achieving a true sense of "the elderly have something to do".

Fourthly, implement flexible deferred retirement policies and build a scientific employment security system. Implementing the delayed retirement policy is an important way to increase the participation rate of elderly workers in labor. However, in the process of implementation, full consideration should be given to the personal factors, family characteristics, and characteristics of different labor markets of elderly workers. At the same time, it is necessary to improve the protection of the rights and interests of elderly people in labor, build a scientific and reasonable employment security system, and allow the elderly group to participate in market labor without any worries.

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