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Research on the Effect of Human Capital Investment on Rural Family Cultural Consumption—Empirical Analysis Based on CFPS2018 Data

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ABSTRACT
Based on the microdata of China Family Panel Studies (CFPS) in 2018, this paper uses the Tobit model to analyze the impact of human capital on rural household cultural consumption. The results show that the improvement of average education years, health status, and the cognitive and non-cognitive ability of families can increase the family entertainment expenditure and its proportion. The core conclusion is still valid in the robustness test of winsorize and replacement of critical variables. Therefore, we should continue to develop rural education, reform the rural medical security system, optimize the allocation of resources, expand the expenditure of rural public cultural construction, and improve the supply quality of cultural products and services.
Keywords*: New Human Capital Theory; rural cultural consumption; non-cognitive ability; Tobit model*

1. INTRODUCTION

With the development of China's economy and the improvement of residents' income levels, people's spiritual and cultural needs continue to rise. In the new era, the solution to major social contradictions in China needs to improve and promote cultural consumption. The party and the state also attach great importance to the reform of the cultural system and the construction of cultural undertakings. In 2018, the State Council issued several opinions on improving the mechanism of promoting consumption system and further stimulating the consumption potential of residents, clearly proposing "summarizing and promoting the pilot work experience and effective mode of guiding urban and rural residents to expand cultural consumption" and "improving the evaluation mechanism of consumption policy".

As a developmental and spiritual consumption, cultural consumption has become an indispensable part of residents' lives in the new era. It is the foundation of cultural team construction and the soil for training cultural professionals, Maoxia [1]. The power of cultural construction also comes from the improvement of residents' cultural consumption capacity, Maoxia [1]. Therefore, studying the mechanism of cultural consumption helps speed up cultural consumption progress and improves cultural construction quality. At present, it is common to study cultural consumption have perspectives such as cultural policy, urban-rural differences, economic growth, but the research based on the micro perspective of personal endowment is rare. Based on the theory of new human capital, this paper takes the rural household cultural consumption expenditure as the research object, using the microdata of CFPS, from the three dimensions of education level, cognitive and non-cognitive ability, and health status uses Tobit model to analyze the impact of human capital on rural household cultural consumption, in order to further understand the mechanism of human capital's impact on cultural consumption and summarize and grasp the characteristics and general laws of rural cultural consumption. It can provide a reference for moderately expanding the cultural consumption of rural residents, promoting the transformation and upgrading of rural industries, and also provide an active and vigorous cultural consumption market for the construction and development of rural culture.

2. DATE SAMPLE AND RESEARCH DESIGN

2.1. Data Source

The data used in this paper comes from the 2018 baseline survey data of China Family Panel Studies (CFPS). The project was implemented by the Institute of Social Science Survey (iSSS) of Peking University. Its purpose is to reflect the changes in China's society, economy, population, education, and health by tracking and collecting data from three levels: individual, family, and community. The sampling frame of the data covers more than 95% of China's population, the most extensive micro survey data

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with the most complete and detailed observation variables in China. The questionnaire is divided into community questionnaires, family questionnaires, adult questionnaires, and children questionnaires. The data used in this paper mainly comes from the family questionnaires and adult questionnaires.

2.2. Variable Selection

In terms of the choice of the explained variables, this paper refers to Zeng Yanping's [2] approach, selects the family cultural and entertainment expenditure(*lncec*), the ratio of cultural and entertainment expenditure to total household expenditure(*cec_exp*) to measure the rural family cultural consumption and carries out the benchmark regression, and uses the ratio of cultural and entertainment expenditure to total household consumption(*cec_pce*), and the ratio of cultural and entertainment expenditure to net household income(*cec_inc*) to carry out the robustness test. In terms of the choice of explanatory variables, based on the New Human Capital Theory and existing data characteristics, and regrading Zhou Haohao [3], Xing Minhui [4] and other scholars, this paper selects the years of education as the proxy variable of human educational capital. With the proportion of health care expenditure as the proxy variable of healthy human capital, the better the family health status, the lower the proportion of health care expenditure. Referring to Jia Jing et al. [5], cognitive ability and non-cognitive ability are used as measurement indexes of human capital. Correctly, word recognition ability and mathematical ability are used as two dimensions of cognitive ability. Emotional Stability, Conscientiousness, and Extroversion in The Five-Factor Model of Personality are used as three dimensions of non-cognitive ability. The selection of control variables mainly includes two aspects: first, family economic characteristics, including per capita family net income, family financial assets, total household debt, etc. The second is the family population characteristics, including family size, average age, sex ratio, and other variables.

2.3. Data Processing

According to the needs of the research, the original data are processed as follows: (1) the family questionnaire is matched with the adult questionnaire, and the urban population sample is removed; (2) the family code is used for grouping calculation, and the family members' education years, cognitive and non-cognitive abilities, age and other variables are integrated into the family data on average; (3) Remove the core variable samples with missing or abnormal values, and adjust the variable values according to the questionnaire logic. Finally, 5684 valid samples were obtained. Besides, to eliminate the influence of heteroscedasticity, this paper logarithmically deals with the variables of the family culture and entertainment expenditure, per capita family net income, family financial assets, and total household debt. The detailed statistical results of the main variables involved in this paper are shown in Table 1.

Table 1. Descriptive Statistical Analysis of Main Variables

Variable	***Identification***	***Mean***	***Std***	***Min***	***Max***	***Observations***
the family cultural and entertainment expenditure	*lncec*	1.132	2.317	0	9.904	5665
the ratio of cultural and entertainment expenditure to total household expenditure	*cec_exp*	0.149	0.494	0	11.51	5162
the ratio of cultural and entertainment expenditure to total household consumption	*cec_pce*	0.188	0.637	0	11.51	5271
the ratio of cultural and entertainment expenditure to net household income	*cec_inc*	0.257	2.079	0	93.75	5649
the years of education	*edu*	3.481	2.791	0	16	5684
the proportion of health care expenditure	*health*	11.67	16.26	0	100	5162
cognitive ability	*cogskill*	14.51	9.984	0	58	5684
non-cognitive ability	*noncogskill*	3.758	1.798	0	11.25	5684
per capita family net income	*lnfincome*	9.167	0.978	4.605	13.85	5667
family financial assets	*lnfinanceasset*	6.449	4.549	0	15.32	5684
total household debt	*lndebt*	3.859	5.217	0	14.91	5684
family size	*familysize*	3.994	2.006	1	21	5684
average age	*age*	32.40	18.73	1.429	92	5684
sex ratio	*gender*	0.325	0.235	0	1	5684

health, *cec_exp*, *cec_pce*, and *cec_inc* are all percentages.

3. MODEL DESIGN

Because the explanatory variables in the sample data are distributed continuously on the positive value and contain a large number of 0 values, and the value range is greater than or equal to 0, which belongs to the truncated data. Therefore, the simple use of the least-square method for multiple OLS regression is likely to lead to inconsistent estimation results, while the use of only the family samples for entertainment consumption will lose a lot of sample information. Therefore, this paper uses the Tobit regression model to test the impact of human capital on rural household cultural consumption. The model design is as follows:

$C_i = \alpha_1 edu + \alpha_2 skill + \alpha_3 health + \beta_1 X_i + \beta_2 H + \beta_p + \mu_i$

$c^* = \max(0, C)$

Among them, the formula is the Tobit model. C_i is the logarithm of consumption expenditure, the proportion of consumption expenditure of family *i*, *edu* is the age level of family education, *skill* is the ability level of family members (including cognitive ability and non-cognitive ability), and *health* is the primary health status of the family. *X* is the family's economic characteristics (including the net income and total debt of the family), *H* is the demographic characteristics such as gender and age, β_p is the fixed effect of the province, and μ_i is the random disturbance term.

4. EMPIRICAL TEST

4.1. Benchmark Regression

In this part, the impact of human capital on the cultural consumption of rural families is regressed based on the benchmark, and the estimated results are shown in Table 2. As shown in table results, column (1) - (4) takes *lncec* as the dependent variable, after adding the family economic characteristics, demographic characteristics, and province fixed effect control variables in turn. The education dimension in human capital has always been significantly positive at the statistical level of 1%, indicating that the increase of *edu* can significantly improve the cultural consumption expenditure of rural families. The results above are consistent with the research results of many scholars, such as Zhao Jilin et al. [6]. It is confirmed that the higher the education level of family members is, the higher the ability of appreciation and understanding of cultural products is, the higher the willingness and demand for cultural consumption will be, and then promote the consumption of family culture and entertainment, Zhang suqiu et al. [7]. On the contrary, *health* has a significant negative relationship with *lncec* in the stepwise regression, indicating that the worse the family's health condition is, the less the cultural and entertainment consumption is, and the medical and health care expenditure caused by health problems has a crowding-out effect on cultural and entertainment expenditure. The results are consistent with the results that Liu Zilan et al. [8] found that there is a significant negative relationship between the household's health status and the enjoyable consumption of the family. In the ability dimension of human capital, under the control of household population characteristics and fixed effect of provinces, *cogskill* is significantly positive at the level of 1%, which indicates that improving cognitive ability is conducive to the increase of family spending on culture and entertainment. In the same case, the marginal effect coefficient of *noncogskill* is positive, but it fails to pass the significance test. Column (5) - (8) takes *cec_exp* as the dependent variable, and also controls the family economic characteristics, family demographic characteristics, and fixed effect of provinces in turn. The coefficient symbols and significance of the variables such as *edu*, *health*, and *cogskill* are the same as the regression results of *lncec*. *Noncogskill* also passed the significance test and was positive at the level of 5%. The marginal effect coefficient is 0.0702, which exceeded the effect of the core variable of traditional human capital - education years - on the ratio of cultural and entertainment expenditure to total household expenditure.

Among the control variables of family economic characteristics, the impact of *lnfincome* and *lnfinanceasset* on *lncec* and *cec_exp* is significantly positive at the statistical level of 1%, which indicates that family economic capital helps to improve the family's cultural consumption ability and promote the family's entertainment expenditure. It is worth mentioning that in the case of controlling the fixed effect of provinces, the impact of *lndebt* on *lncec* is significantly positive at the statistical level of 5%, while in the regression of *cec_exp*, it fails to pass the significance test, showing only a weak positive correlation. The reason may be due to the high proportion of housing debt in household debt, because housing debt will have a certain inhibitory effect on consumption through the "housing-slave effect", squeezing out development and enjoyment consumption, Zhang Yalin et al. [9].

From the perspective of demographic characteristics of control variables, for cultural consumption, *familysize* shows a "scale economy effect", that is, cultural and entertainment expenditure increases with the increase of family population. There is a significant negative relationship between the average age of the family and the cultural consumption of the family. The cultural consumption will decrease with the increase of the age of the family members, which proves that the aging population has the crowding-out effect on the cultural consumption, Cao Jiabin et al. [10]. In terms of *gender*, the higher the proportion of male family members, the lower the consumption of cultural and entertainment, and the lower the ratio of cultural and entertainment expenditure to total expenditure. In other words, the more female family members, the higher the family's cultural consumption.

Table 2. Benchmark Regression Results

Variable	***lncec***				***cec_exp***			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
edu	0.272***	0.113	0.180**	0.218***	0.0408***	0.0180	0.0299*	0.0363**
	(0.0824)	(0.0829)	(0.0833)	(0.0831)	(0.0155)	(0.0161)	(0.0164)	(0.0164)
health	-0.0629***	-0.0473***	-0.0298***	-0.0271**	-0.0121***	-0.0102***	-0.00709***	-0.00670***
	(0.0116)	(0.0116)	(0.0115)	(0.0114)	(0.00219)	(0.00227)	(0.00228)	(0.00228)
cogskill	0.184***	0.153***	0.111***	0.129***	0.0310***	0.0269***	0.0187***	0.0219***
	(0.0273)	(0.0271)	(0.0278)	(0.0278)	(0.00511)	(0.00524)	(0.00544)	(0.00546)
noncogskill	-1.216***	-0.980***	0.377**	0.287	-0.198***	-0.167***	0.0827**	0.0702**
	(0.121)	(0.121)	(0.182)	(0.183)	(0.0224)	(0.0231)	(0.0355)	(0.0358)
lnfincome		1.107***	1.464***	1.333***		0.146***	0.204***	0.176***
		(0.180)	(0.185)	(0.187)		(0.0347)	(0.0359)	(0.0366)
lnfinanceasset		0.285***	0.245***	0.242***		0.0474***	0.0412***	0.0408***
		(0.0382)	(0.0374)	(0.0371)		(0.00738)	(0.00732)	(0.00731)
lndebt		0.179***	0.0956***	0.0694**		0.0238***	0.00924	0.00445
		(0.0300)	(0.0300)	(0.0298)		(0.00581)	(0.00590)	(0.00591)
familysize			0.574***	0.536***			0.0840***	0.0786***
			(0.0932)	(0.0925)			(0.0183)	(0.0183)
age			-0.113***	-0.109***			-0.0226***	-0.0223***
			(0.0170)	(0.0172)			(0.00332)	(0.00337)
gender			-1.022	-1.504			-0.123	-0.206
			(0.917)	(0.915)			(0.179)	(0.179)
Controlling province effect	NO	NO	NO	YES	NO	NO	NO	YES
Pseudo R^2	0.0276	0.0417	0.0539	0.0662	0.0349	0.0478	0.0631	0.0810
Observations	5,162	5,000	5,000	5,000	5,162	5,000	5,000	5,000

The values in brackets are robust standard errors. *, **, ***respectively indicate that the results are significant at 10%, 5%, and 1% confidence levels. The same below.

4.2. Robustness Test

4.2.1. Winsorize

In order to verify whether the benchmark regression results are robust, Tobit regression is performed again after 1% of the dependent variables are processed by double-end winsorize, and the estimated results after tail reduction are reported in column 1-2 of Table 3. It can be seen that the coefficient and significance of each dimension in the explanatory variable are basically consistent with the benchmark regression, and the coefficient of the control variable is also basically consistent with the benchmark regression results in terms of sign and significance, indicating that the research conclusion of this paper has not changed substantially.

4.2.2. Change Dependent Variable

In this part, the measurement method of the dependent variable is changed into *cec_pce* and *cec_inc*, and the robustness is estimated according to the benchmark model. It can be seen from the estimation results in columns 3-4 of Table 3 that the coefficient symbols and directions of *edu*, *health*, and *cogskill* are still consistent with the benchmark regression results. *noncogskill* is significantly positive at the level of 10%, indicating that this paper's core conclusion is still tenable when other indicators are used to measure cultural consumption and human capital.

In the control variables, the marginal effect of *lndebt* on the ratio of entertainment expenditure is not significant, which is consistent with the estimated result of *cec_exp* when the benchmark regression, indicating that the total household debt can increase the absolute value of entertainment expenditure to a certain extent, but the impact on the proportion of cultural consumption is not significant. The marginal effect coefficient of *lnfincome* on *cec_pce* is significantly positive, but it is not stable in the regression of *cec_inc*. The reason may be that the

dependent variable is *cec_inc*, and the impact of the increase of per capita family net income on this proportion cannot be highlighted, Zeng Yanping [2].

Table 3. Robustness Test Results

Variable	***Winsorize***		***Change Dependent Variable***	
	lncec	*cec_exp*	*cec_pce*	*cec_inc*
	(1)	(2)	(3)	(4)
edu	0.217***	0.0308**	0.0434**	0.168***
	(0.0829)	(0.0129)	(0.0205)	(0.0644)
health	-0.0269**	-0.00550***	-0.00945***	-0.0257***
	(0.0114)	(0.00180)	(0.00287)	(0.00881)
cogskill	0.129***	0.0182***	0.0271***	0.0778***
	(0.0277)	(0.00430)	(0.00684)	(0.0214)
noncogskill	0.284	0.0595**	0.0798*	0.231*
	(0.182)	(0.0282)	(0.0448)	(0.139)
lnfincome	1.326***	0.154***	0.236***	-0.214
	(0.186)	(0.0289)	(0.0458)	(0.140)
lnfinanceasset	0.241***	0.0335***	0.0513***	0.159***
	(0.0371)	(0.00576)	(0.00914)	(0.0287)
lndebt	0.0692**	0.00448	0.00939	0.0379
	(0.0298)	(0.00465)	(0.00738)	(0.0231)
familysize	0.532***	0.0604***	0.0984***	0.147**
	(0.0923)	(0.0144)	(0.0229)	(0.0716)
age	-0.108***	-0.0183***	-0.0266***	-0.0832***
	(0.0171)	(0.00266)	(0.00422)	(0.0131)
gender	-1.495	-0.206	-0.279	-1.194*
	(0.912)	(0.141)	(0.225)	(0.699)
Controlling province effect	YES	YES	YES	YES
Pseudo R^2	0.0661	0.0924	0.0768	0.0429
Observations	5,000	5,000	5,000	5,000

Standard errors in parentheses,***p<0.01, ** p<0.05, * p<0.1

5. CONCLUSION

5.1. Research Conclusion

This paper uses the CFPS2018 and Tobit model's micro survey data to evaluate the impact of rural human capital on family cultural consumption. The results show that: First, the improvement of the family's education level can affect the family's cultural consumption through the enhancement of Cultural Consumption Willingness, which has a significant role in promoting the expenditure on entertainment and its proportion. Second, using the proportion of health care expenditure to reflect the family's overall health status, we found that there was a negative relationship between medical and health care expenditure and entertainment expenditure. When the proportion of court health care is relatively high, the cultural consumption decreases significantly, which indicates that the increase of medical care expenditure will have a crowding-out effect on cultural consumption. Thirdly, the cognitive and non-cognitive ability levels of family members have a significant positive effect on cultural consumption. In the regression of *cec_exp*, the influence coefficient of non-cognitive ability even exceeds the number of years of education. The findings also break through the previous research regarding the personal skill level as the proxy variable of ability dimension. Fourthly, family economic capital is the basis of family cultural consumption, and the improvement of family income, financial assets, and appropriate liabilities are conducive to the realization of cultural consumption. Besides, this paper also tested the robustness of the above conclusions and found that the above estimation results have strong robustness.

5.2. Policy Implications

First, under the background of the Rural Revitalization Strategy, education investment and construction is still an

essential task of rural cultural construction. The government should actively improve the education security system in rural areas, increase investment in education resources in rural areas, especially in non-compulsory education in rural areas. Meanwhile, increase investment in rural continuing education funds, develop agricultural teacher resources and farmer resources with cultural basis, making full use of distance education, network teaching, and other channels to carry out continuing rural education, accumulating rural education human capital for cultivating rural cultural consumption market.

Secondly, health status is closely related to the consumption of residents. At present, the phenomenon of "poverty caused by, returning to poverty due to illness" is prevalent in rural areas. In the case of limited income capacity, excessive health care expenditure will squeeze the space of other consumption expenditure. Therefore, we must do an excellent job in the health care workers in rural areas, reform the rural medical security system, to "protect both serious diseases and minor diseases". Because of the poor, we should appropriately increase the insurance's intensity for serious diseases, reasonably distribute the medical resources between regions, improve the medical accessibility of the rural population, and consider the medical assistance as a whole.

Third, we should consider education from two dimensions: cognitive ability and non-cognitive ability. In addition to the teaching of knowledge and professional skills, the cultivation of self-confidence, communication ability, empathy, curiosity, team spirit, and other personality characteristics are equally important. Besides, cultural resources such as libraries, museums, and public cultural activities are also effective channels to cultivate people's non-cognitive ability. The government should increase rural public cultural expenditure to provide external conditions for the cultivation of rural residents' non-cognitive ability.

5.3. Further Research

This paper only studies the rural family cultural consumption from three dimensions of the new human capital theory, but not profoundly discusses the age and intergenerational effect of the family cultural consumption and how human capital affects the transmission mechanism of the family cultural consumption. There are still some deficiencies in this paper. In the future, we will continue to study the impact of human capital on the cultural consumption of rural families from the perspectives of population characteristics, economic characteristics, regional differences and mediating effect.

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