

The Impact of Internet Use on the Happiness of the Elderly: An Empirical Analysis Based on CFPS2022 Data

Jianping Liu^{1,*}, Jinru Liu², Yuyan Lan², Qimeng Song², Wentian Jiang²

¹*Medical Humanities Research Institute, Zhejiang Provincial Key Research Base of Philosophy and Social Sciences, Wenzhou Medical University, Wenzhou, 325035, Zhejiang, China*

²*School of Medical Humanities and Management, Wenzhou Medical University, Wenzhou, 325035, Zhejiang Province, China*

**Corresponding author*

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Abstract: In the context of population aging, the well-being of the elderly has attracted much attention from the academic community. The Internet has reshaped the life and social model of the elderly. Based on CFPS data in 2022, it is found that Internet use can significantly improve the subjective well-being of the elderly, and the user's well-being is about 0.2 points higher; Cultural capital has a negative moderating effect. The lower the cultural capital, the more obvious the improvement of happiness brought by the Internet. Research proposes intervention strategies from the perspectives of family, society, and government to enhance the happiness of the elderly population.

1. Introduction

According to data from the National Bureau of Statistics of China, as of the end of 2024, the population aged 60 and above reached 310.31 million (surpassing 300 million for the first time), accounting for 22% of the total population. The low birth rate and increasing life expectancy are exacerbating population aging and putting pressure on the elderly security system. CNNIC's 55th Statistical Report on China's Internet Development shows that by the end of 2024, China's Internet users will reach 1108 million, with a penetration rate of 78.6% (CNNIC, 2024).[16, 20] The contradiction between the iteration of digital technology and the decline in the information reception ability of the elderly is highlighted, and alleviating this contradiction is of great significance for enhancing the sense of achievement of the elderly.

2. Current Research

The development of the Internet reshapes the lifestyle of the elderly, and its use helps improve the well-being of the elderly [1]. Internet use is significantly and positively correlated with the well-being of the elderly [2,3,4,5,6], and intergenerational technology transfer can help the elderly bridge the digital divide [3,7,8,9]. The Internet can make up for social loss and alleviate loneliness. Social capital plays a mediating role [12, 13, 14, 15], and has prominent benefits for rural elderly [17]. The happiness effect exhibits group heterogeneity, influenced by education level, usage type,

and regional culture [6,17,18,19]. The welfare of the elderly requires the synergy of digital technology and traditional security, and it is still necessary to bridge the digital divide and promote aging friendly construction to serve the elderly population [1].

3. Research Content and Methods

This study is based on the 2022 China Family Tracking Survey (CFPS) data, and the sample is 60 years old and above. It focuses on the impact of Internet use on happiness and the moderating role of cultural capital. Well being is measured by a 0-10 self-evaluation scale, Internet use is a binary variable, and cultural capital is measured by years of education, while controlling the fixed impact of personal characteristics, provinces and years.[10, 11] The empirical process involves descriptive statistics, correlation analysis, baseline regression, and moderate effects model testing, combined with relevant theories to explain the research results.

4. Research Design

The United Nations and the World Health Organization define people aged 60 and above as elderly, and this study follows this definition. CFPS was conducted by Peking University ISSS, with a sample coverage of 25 provinces and high representativeness and reference value.

4.1 Variable measurement

(1) Dependent variable: Elderly people's sense of happiness, measured by a questionnaire 0-10 self-evaluation score (0=very unhappy, 10=very happy).

(2) Explanatory variable: Internet use, CFPS questionnaire measurement, yes=1, no=0.

(3) Moderating variable: cultural capital [3], measured by years of education, according to CFPS coding (0=illiterate/semi literate, etc., the higher the score, the stronger the capital), to test the moderating effect.

(4) Control variables: family size, marital status, gender, age, social status, health status. The variable definition codes are shown in Table 1.

Table 1 Variable Definition Table

Variable type	Variable name	Variable Description
The dependent variable	Happiness	The questionnaire item "How happy are you?" is scored on a 0-to-10 scale, with 0 indicating the lowest happiness and 10 the highest
explanatory variable	Internet usage	Whether to use the Internet , 1 for yes and 0 for no
Moderating variable	Cultural capital	Years of Education a minimum of 0 t,a maximum of 22
control variables	Family size	The number of family members
	Marital status	Marriage status: 1 for married, 0 for other marital statuses
	Gender	Female: 1, Male: 0
	Age	The numerical value of age
	Social status	The evaluation of social status ranges from 1 to 5 points. 1 represents the lowest level, and 5 represents the highest level
	Health condition	The assessment of health condition ranges from 1 to 5 points. 1 represents the lowest level and 5 represents the highest level

4.2 Model Design

To examine the impact of internet usage on the well-being of the elderly and its underlying mechanism, to investigate how the intensity of this impact varies across different contexts, and to test whether cultural capital moderates this relationship—with a particular focus on the moderating effect of cultural capital on the relationship between internet usage and the well-being of the elderly—this paper draws on model from Mi Yuanzhe's study on the impact of internet usage on the well-being of the elderly, additionally, it controls for province and year fixed effects, and constructs two types of econometric models.

Linear regression model: $Happiness_{it} = \alpha_0 + \alpha_1 inter_{it} + \alpha_2 X_{it} + \mu_i + \nu_t + \varepsilon_{it}$

X_{it} represents the vector of control variables, μ_i and ν_t denote province fixed effects and time fixed effects respectively.

Moderation effect model: $Happiness_{it} = \eta_0 + \eta_1 inter_{it} + \eta_2 EducationLevel_{it} + \eta_3 inter_{it} * EducationLevel_{it} + \eta_4 X_{it} + \mu_i + \nu_t + \varepsilon_{it}$

5. Research findings

5.1 Sample characteristics

Based on the CFPS 2022 data, this study first analyzed the basic situation of elderly people's internet usage and their sense of happiness (see Table 2).

Table 2: Descriptive Statistics

Variable Name	Observations	Mean	Standard Deviation	Minimum	Median	Maximum
Happiness	11490	7.61	2.20	0	8	10
Internet usage	11490	5.67	4.73	0	6	19
Cultural capital	11490	0.20	0.39	0	0	1
Family size	11490	3.21	2.02	1	2	17
Marital status	11490	0.79	0.40	0	1	1
Gender	11490	0.61	0.48	0	1	1
Age	11490	68.11	6.16	60	67	95
Social status	11490	3.33	1.10	1	3	5
Health condition	11490	2.57	1.21	1	3	5

The average age of the sample is 68 years old (60-95 years old), with an average happiness level of 7.61/10 and a median of 8, showing an overall positive trend. The average value of cultural capital is 5.67, the standard deviation is 4.73, and the median is 6, with the highest dispersion, making it an important analytical variable. Internet usage rate is 20%, which is the key variable. The average family size is 3.21 people, with a median of 2 people (right skewed distribution), and most elderly people live in households with two or one person. 79% of elderly people are married, with females accounting for 61%; The age range is concentrated between 62-74 years old, with the majority being young and elderly people. The average social status is 3.33/5, the average health status is 2.57 (1=very unhealthy, 5=very healthy), and the sample average is slightly unhealthy.

5.2 Correlation analysis

This study examines the correlations among the main variables. The results show that there are significant correlations among the variables, and the directions are largely consistent with expectations (see Table 3 for details).

Table 3: Correlation Analysis

	1	2	3	4	5	6	7	8	9
Age (1)	1								
Cultural capital (2)	-0.132**	1							
Marital status (3)	-0.257**	0.161**	1						
Gender (4)	-0.019**	0.176**	0.241**	1					
Health condition (5)	-0.065**	0.094**	0.060**	0.136**	1				
Social status (6)	0.057**	0.016**	0.056**	0.031**	0.095**	1			
Family size (7)	-0.235**	0.077**	0.002	-0.003	-0.004	-0.035**	1		
Internet usage (8)	-0.123**	0.038**	-0.003	-0.097**	0.113**	-0.008	0.197**	1	
Happiness (9)	-0.014*	0.148**	0.038**	-0.003	0.097**	0.113**	0.326**	0.197**	1

Note: *p<0.05, **p<0.01

Age plays an important negative moderating role, and is significantly negatively correlated with cultural capital ($r=-0.132$, $p<0.01$), Internet use rate ($r=-0.197$, $p<0.01$), etc. The older the age, the more unfavorable the education and digital integration. Internet use is significantly positively correlated with cultural capital ($r=0.038$, $p<0.01$) and happiness ($r=0.197$, $p<0.01$). The higher the cultural capital, the easier it is to use the Internet, and thus enhance happiness. There is a significant positive correlation between happiness and cultural capital ($r=0.148$, $p<0.01$).

5.3 Regression analysis

To examine the causal relationship between internet usage and the well-being of the elderly, this study conducted a regression analysis. The results showed that internet usage significantly enhances the well-being of the elderly (see Table 4).

Table 4 Baseline Regression

Variable name	Model one	Model two
Internet usage	0.165*** (3.207)	0.200*** (4.049)
Family size		-0.019* (-1.839)
Marital status		0.517*** (9.981)
Gender		-0.216*** (-5.282)
Age		0.030*** (9.050)
Social status		0.479*** (27.043)
Health condition		0.311*** (19.150)

Observations	11490	11490
Year	YES	YES
Pro	YES	YES

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

When other factors were not controlled, the happiness of the elderly who used the Internet was 0.165 points higher than that of the non users ($p < 0.001$), supporting the relevant hypothesis. After adding control variables, the Internet utilization coefficient rose to 0.200, with more significant correlation. Marital status (coefficient 0.517, $p < 0.001$), social status (0.479), health (0.311), and age (0.030) are strong positive predictors of happiness; The gender coefficient is -0.216, indicating that women have lower levels of happiness; The family size coefficient is -0.019 ($p < 0.1$), indicating a slight decrease in happiness with an increase in members.

5.4 Moderation effect test

This study uses hierarchical regression analysis to examine the moderating effect of cultural capital. After controlling for relevant variables, a nested model was constructed by sequentially incorporating independent variables, moderating variables, and interaction terms. The continuous predictor variables were centralized to reduce multicollinearity. The results are shown in the table below (see Table 5).

Table 5 Moderating Effect test

	Model one	Model two	Model three
Constant	2.932** (11.728)	2.879** (11.526)	2.910** (11.646)
Age	0.030** (9.050)	0.032** (9.452)	0.032** (9.467)
Marital status	0.517** (9.981)	0.494** (9.522)	0.486** (9.375)
Gender	-0.216** (-5.282)	-0.259** (-6.249)	-0.264** (-6.380)
Health condition	0.311** (19.150)	0.305** (18.780)	0.305** (18.754)
Family size	-0.019 (-1.839)	-0.017 (-1.663)	-0.017 (-1.680)
Social status	0.479** (27.043)	0.483** (27.305)	0.484** (27.365)
Internet usage	0.200** (4.049)	0.081 (1.532)	0.185** (2.938)
Cultural capital		0.028** (6.060)	0.027** (5.890)
Internet usage*Cultural capital			-0.036** (-3.051)
Sample size	11490	11490	11490
R^2	0.114	0.117	0.118
Adjusted R^2	0.114	0.117	0.117
F value	$F(7,11482)=211.912,$ $p=0.000$	$F(8,11481)=190.591,$ $p=0.000$	$F(9,11480)=170.571,$ $p=0.000$
ΔR^2	0.114	0.003	0.001
ΔF value	$F(7,11482)=211.912,$ $p=0.000$	$F(1,11481)=36.724,p=0.000$	$F(1,11480)=9.307,p=0.002$

* $p < 0.05$ ** $p < 0.01$, t-statistics are reported in parentheses

In model 1, Internet use positively predicted well-being significantly ($B=0.200$, $p<0.01$), $R^2=0.114$. After model 2 added cultural capital, R^2 increased to 0.117 ($\Delta R^2=0.003$, $p<0.001$), the main effect of cultural capital was significant ($B=0.028$, $p<0.01$), and the main effect of Internet use was no longer significant. After adding interaction terms to Model 3, $R^2=0.118$. The interaction term was significant ($B=-0.036$, $p=0.002$), and cultural capital weakened the positive impact of Internet use on happiness. Among the control variables, age, marital status, and other factors positively predict happiness, while gender is significantly negative and family size is not significant.

6. Main conclusion

Internet use has a significant positive impact on the well-being of the elderly. After controlling related factors, the average user's well-being is 0.200 points higher. Digital technology can improve the life of the elderly.

Cultural capital negatively moderates the relationship between the two, with higher cultural capital leading to weaker marginal happiness effects in older adults and lower cultural capital leading to more significant improvements in happiness after overcoming technological barriers.

Marital status, health, and social status are important factors affecting happiness, and the expansion of family size slightly reduces happiness. Policy formulation needs to consider the frictional costs of intergenerational cohabitation.

7. Suggestions for Improving the Happiness of the Elderly

Internet use has a positive impact on the well-being of the elderly, which is negatively regulated by cultural capital. In combination with personal characteristics, suggestions are made from the family, society and government dimensions.

7.1 Family micro-environment: Enhancing emotional support among family members and providing digital technology guidance

Family is the main place of social support for the elderly, and marriage has the greatest impact on their sense of happiness. The larger the family size, the weaker their sense of happiness. Family intervention needs to give consideration to emotional companionship and digital empowerment, alleviate intergenerational pressure, and focus on Internet teaching, nursing division and guidance for the elderly with low cultural capital.

7.2 Social meso-level ties: Enhance digital literacy training and establish volunteer digital assistance teams for the elderly

Communities can provide digital services for the elderly from three aspects: conducting embedded digital literacy training, integrating online and offline social activities, and providing digital assistance to elderly volunteers, focusing on practical anti fraud measures, narrowing the gender gap in happiness, and ensuring that low cultural capital elderly people share the digital dividends.

7.3 Government Macro Ecology: Strengthening Top-Level Planning, Infrastructure Optimization, and Institutional Supply

The government can bridge the digital divide among the elderly through top-level planning,

infrastructure, and institutional guarantees, promote legislation on information accessibility, improve remote healthcare, promote differentiated digital welfare, and improve the social security system to ensure that the elderly share the digital dividend and enhance their level of protection.

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