

Internet Use and Subjective Well-being: Bootstrap Mediation Analysis from Environmental Perspective

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Abstract--Recently, with the implementation of a number of environmental protection policies such as the "dual carbon" target, the Chinese government has taken another step forward in its actions to improve people's livelihood and well-being. Based on the 2013 data of the Chinese General Social Survey, this paper constructs an empirical analysis model, uses SPSS software to preprocess variable data and descriptive statistical analysis, and selects multiple linear regression to analyze the influence relationship between variables, and further uses Bootstrap to analyze the mediation effect. The results show that Internet use, environmental cognition, and government environmental governance satisfaction all positively affect subjective well-being, environmental cognition and government environmental governance satisfaction have a significant mediating effect between the Internet use and subjective well-being path. Finally, based on the results of the regression analysis, relevant policy recommendations are put forward, which will help the government to improve the residents' subjective well-being from the environmental governance level.

Keywords--Internet use; environmental cognition; government environmental governance satisfaction; subjective well-being; intermediary effect

1 Introduction

The rapid development of China's national economy has markedly improved people's lives ^[1], and at the same time caused huge consumption of natural resources and worrying environmental pollution ^[2]. The quality of the environment can easily affect the psychology or behavior of residents, which in turn affects residents' subjective well-being. With the development of the Internet, the main way for residents to obtain environmental quality information has gradually shifted from traditional media to the Internet. At the same time, residents' environmental awareness and satisfaction with government environmental governance are the main factors for residents to assess environmental quality. According to existing studies, the research on the path of influence of environmental quality changes on subjective well-being has gradually attracted the attention of scholars, but few scholars have studied the relationship between Internet use, environmental cognition, government environmental governance satisfaction, and subjective well-being. This article aims to use the data of CGSS in 2013, through empirical analysis, to explore the impact of the Internet on the subjective well-being of residents under the two intermediary variables of environmental cognition and government environmental governance satisfaction. This article not only supplements the intermediary mechanism of the influence of Internet use on residents' subjective well-being, but also supplements the environmental theory

system from both the residents' own factors and external perception factors. At the same time, it provides reference for the government to improve the subjective well-being of residents, enriches previous research, and provides reference for follow-up in-depth research.

2 Theoretical hypothesis

2.1 Internet use and subjective well-being

With the development of network technology, the use of the Internet has become an important engine and internal driving force of economic growth. The application and promotion of the Internet has penetrated into every corner of society. Some studies have shown that the development of the Internet has broken through the space-time limit of interpersonal communication, accelerated the rate of information dissemination, and met the spiritual needs of interpersonal communication. In the traditional way of communication, people will have anxiety when they wait for a reply, and anxiety will reduce the subjective well-being of individuals. Therefore, when people use the Internet, they can expand their own boundary effect and reduce the waiting time for communication, which is conducive to improving people's subjective well-being. So we assume that:

H1: Internet use has a positive impact on subjective well-being.

2.2 Environmental cognition

With the improvement of economic level, people pay more attention to the quality of life and the quality of living environment, such as the sanitation of water resources and the causes of air pollution. The Internet can be used to receive and search the knowledge they want to know. In the face of environmental news, if residents trust the content of environmental news, then residents will increase their own environmental knowledge; if residents question the content of environmental news, in order to seek the truth, they can collect relevant information and materials from the Internet to verify its authenticity, which will also improve the awareness of the environment of residents. So we assume that:

H2a: Internet use has a positive impact on environmental cognition.

Residents will receive a variety of information and knowledge in daily life, and environmental cognition is helpful for residents to understand the quality of the environment. Residents' subjective perception of environmental quality will have a more intuitive feeling for residents^[3]. In addition, relevant studies have shown that environmental cognition will positively affect residents' participation in pro-environmental behavior, pro-environmental behavior will meet the needs of residents to protect the environment and save resources, when the needs of residents are met, residents will feel happy. So we assume that:

H2b: environmental cognition has a positive impact on subjective well-being.

Most of the previous studies have ignored the way in which residents' environmental cognition will participate in the impact of the frequency of Internet use on their subjective well-being. This is not only related to the behavior of Internet use, but also related to the environmental cognition of residents. This paper attempts to focus on the relationship between the three, and

to explore the mechanism of action among the three. Therefore, the following assumptions are made in this paper:

H2c: environmental cognition has an intermediary effect between the effects of Internet use on subjective well-being.

2.3 Government environmental governance satisfaction

The supervision mode of traditional media is difficult to work for the new media, and the negative news and even false news of environmental governance in the Internet are easy to spread on a large scale, which catalyzes the public dissatisfaction with the government's environmental protection. According to relevant research, a large number of negative reports on environmental governance will make the public have great doubts about the degree of pollution and control of their own living environment, and will also deepen the mistrust of government supervision and control means. Therefore, we assume that:

H3a: The use of the Internet has a negative impact on the government environmental governance satisfaction.

Government environmental governance satisfaction depends on the degree of recognition of government environmental policies and measures. A comfortable living environment can significantly improve the life satisfaction of residents^[4]. High level of life satisfaction plays an important role in prolonging life expectancy and maintaining physical and mental health^[5]. The higher the degree of physical and mental health of residents, the higher the satisfaction of residents' life, the stronger the subjective well-being of residents. So we assume that:

H3b: government environmental governance satisfaction has a positive impact on subjective well-being.

According to the previous hypothesis, Internet use has a negative impact on government environmental governance satisfaction, but Internet use can positively affect subjective well-being, and government environmental governance satisfaction also has a positive impact on subjective well-being. It can be guessed that the satisfaction of government environmental governance can positively affect the path of Internet use to subjective well-being.

H3c: there is a significant intermediary effect between the impact of Internet use on subjective well-being and government environmental governance satisfaction.

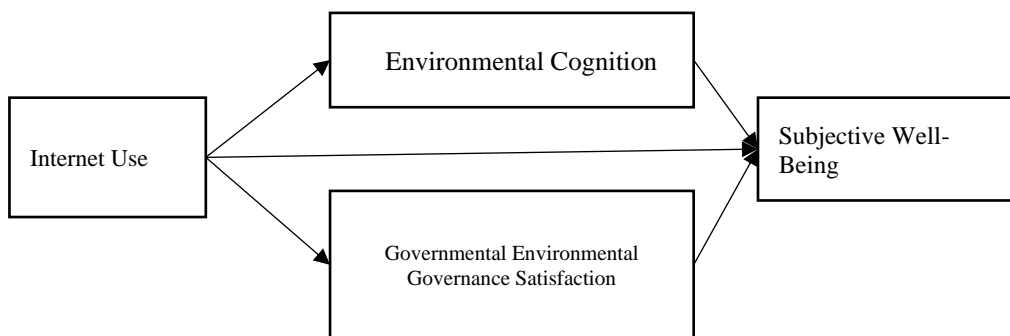


Figure 1. influence path model.

3 Research and design

3.1 Data sources

The data come from the 2013 China Comprehensive Social Survey (CGSS2013). After screening and eliminating the invalid value, the final survey sample is 8943, which has a strong national representativeness. The questionnaire involves social demographics, social networks, environmental cognition, government environmental governance satisfaction, residents' subjective well-being and so on.

3.2 Variable selection and analysis strategy

Independent variable is Internet use, dependent variable is subjective well-being.

Intermediary variables are environmental cognition and government environmental governance satisfaction. 12 questions were used to measure the degree of environmental cognition, and SPSS software was used to analyze the reliability of the item. Cronbach's Alpha coefficient was 0.904, which indicated that the reliability of the scale was very good, and two questions were used to measure the satisfaction of government environmental governance.

Referring to previous studies, we use some demographic variables as control variables for statistical analysis. For example, variables such as gender, city, political status, education, region and census register.

4 Results

4.1 Descriptive statistics and correlation analysis

First of all, descriptive statistical analysis and correlation analysis between variables are carried out, and the results are shown in Table 1. Among them, there is a significant positive correlation between Internet use, environmental cognition and residents' subjective well-being. There is a significant positive correlation between government environmental governance satisfaction and subjective well-being. There is a significant negative correlation between Internet use and government environmental satisfaction.

4.2 Hypothesis test

Next, a series of regression analysis is carried out to test our theoretical assumptions. At the same time, we carry on the multiple collinearity test to each model, according to the data, the VIF (variance expansion factor) value in all models is less than the standard request 10. This means that there is no multiple collinearity problem between the variables in each regression equation.

Table 1. Means, standard deviations, and inter-correlations between the study variables

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
City	41.54	27.62	1									
Region	2.84	1.78	0.11**	1								
Gender	1.48	0.50	0.03**	-0.01	1							

Education	5.21	3.09	-0.12**	-0.44**	-0.10**	1						
PS	3.59	0.98	0.00	0.16**	0.15**	-0.33**	1					
CR	1.70	1.00	0.00	-0.44**	0.00	0.30**	-0.16**	1				
IU	2.31	1.58	-0.13**	-0.35**	-0.04**	0.63**	-0.15**	0.17**	1			
SWB	3.78	0.82	-0.02	0.02*	0.04**	0.05**	-0.07**	0.02**	0.05**	1		
GEGS	3.12	1.05	0.04**	0.14**	0.01	-0.16**	-0.01	-0.08	-0.18**	0.13**	1	
EC	0.77	0.28	-0.04**	-0.15**	-0.09**	0.29**	-0.12**	0.09**	0.23**	0.07**	-0.06**	1

Notes: "IU" indicates internet use, "SWB" indicates subjective well-being, "GEGS" indicates Government Environmental Governance Satisfaction; "EC" indicates environmental cognition, "CR" indicates Census Register, "PS" indicates Political Status. *P < 0.05, **P < 0.01.

Table 2. Regression test of IU, GEGS and EC

	EC		GEGS		SWB					
	Model 1.1	Model 1.2	Model 2.1	Model 2.2	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
City	-0.005	-0.001	0.016	0.01	-0.019	-0.017	-0.019	-0.017	-0.021*	-0.019
Region	-0.030*	-0.021	0.080**	0.067**	0.07**	0.074**	0.071**	0.076**	0.059**	0.065**
Gender	-0.060**	-0.061**	0.002	0.003	0.053**	0.052**	0.057**	0.056**	0.052**	0.052**
Education	0.264**	0.214**	-0.138**	-0.065**	0.052**	0.026	0.035**	0.013	0.07**	0.035*
PS	-0.024*	-0.029**	-0.065**	-0.058**	-0.064**	-0.067**	-0.063**	-0.065**	-0.056**	-0.059**
CR	-0.008	-0.003	-0.009	-0.015	0.021	0.024*	0.022	0.024*	0.023	0.026*
IU		0.081**		-0.119**		0.043**		0.038**		0.059**
EC							0.065**	0.063**		
GEGS									0.131**	0.135**
R ²	0.088	0.082	0.034	0.042	0.011	0.012	0.015	0.016	0.028	0.03
Adjusted R	0.088	0.091	0.033	0.041	0.01	0.011	0.014	0.015	0.027	0.029
Δ R	0.088	0.004	0.034	0.008	0.011	0.001	0.004	0.004	0.017	0.017
F	144.013	129.444	52.154	56.149	16.574	9.799	19.219	17.779	36.147	34.025
VIF (MAX)	1.436	2.028	1.436	2.028	1.436	2.028	1.463	2.078	1.443	2.032

Notes: VIF indicates variance inflation factor. *: P < 0.05, **: P < 0.01.

4.3 Mediating effect analysis

According to model 5 in Table 2, Internet use can significantly positively predict subjective well-being ($\beta = 0.043$, $P < 0.01$). Hypothesis 1 is verified. Then, we test the intermediary role of environmental cognition and government environmental governance satisfaction in the relationship between Internet use and subjective well-being. As shown in Table 2, Model 1.2,

Internet use had a significant positive prediction to environmental cognition ($\beta = 0.081$, $P < 0.01$). So far, hypothesis 2a has been verified.

As shown in Model 6 in Table 2,, environmental cognition significantly positively predicted subjective well-being ($\beta = 0.065$, $P < 0.01$). Hypothesis 2b was verified. Model 7 shows that Internet use ($\beta = 0.038$, $p < 0.01$) and environmental cognition ($\beta = 0.063$, $p < 0.01$) significantly positively predict subjective well-being. At the same time, the predictive value of Internet use for subjective well-being is close to the predictive value of environmental cognition for subjective well-being. Hypothesis 2c has been preliminarily verified.

Model 2.2 in Table 2, shows that Internet use is significantly negative to predict government environmental governance satisfaction ($\beta = -0.119$, $P < 0.01$), and hypothesis 3a is verified. Model 8 in Table 2 shows that government environmental governance satisfaction significantly positively predicted subjective well-being ($\beta = 0.131$, $P < 0.01$). Hypothesis 3b was verified. Model 9 shows that Internet use ($\beta = 0.059$, $p < 0.01$) and government environmental governance satisfaction ($\beta = 0.135$, $p < 0.01$) are significantly positive predict for subjective well-being. At the same time, the predictive value of Internet use for subjective well-being is relatively low, hypothesis 3c has been preliminarily verified.

Finally, the process plug-in of SPSS24.0 is used to test the intermediary effect, and the percentile bootstrap test step of deviation correction is used. Table 3 shows that the confidence interval does not include 0, indicating that the indirect effect of Internet use on subjective well-being through environmental cognition is significant (index = 0.0027, 95% CI [0.0016, 0.0040]), hypothesis 2c is verified again. As shown in Table 3, the indirect impact of Internet use on individual subjective well-being through government environmental governance satisfaction (index = -0.0083, 95 per cent CI [- 0.0109, -0.0063]), hypothesis 3c is verified again.

Table 3. Bootstrap results for the mediation effect

Direct impact of internet use on individuals' subjective well-being						
	Effect	S.E.	t	p	LLCI	ULCI
EC	0.0196	0.0071	2.7562	0.0059	0.0057	0.0336
GECS	0.0306	0.0071	4.3205	0.0000	0.0167	0.0445
Indirect impact of internet use on individuals' subjective well-being						
	Effect	Boot SE	Boot LLCI	Boot ULCI		
EC	0.0027	0.0006	0.0016	0.0040		
GECS	-0.0083	0.0012	-0.0109	-0.0063		

Note: S.E. Indicates Standard error; LLCI and ULCI indicate the minimum and maximum values of the confidence interval; This study uses bootstrap for random sampling 5000 times.

5 Conclusion

Based on the Chinese General Social Survey in 2013, this article explores the impact of Internet use on subjective well-being in terms of environmental perception from the two dimensions of environmental cognition and government environmental governance satisfaction. The results show that Internet use significantly positively predicts environmental cognition, and Internet

use significantly negatively predicts government environmental governance satisfaction. Both environmental cognition and government environmental governance satisfaction can positively affect subjective well-being. At the same time, environmental cognition and government environmental governance satisfaction both play a mediating role in the impact of Internet use on subjective well-being. In my opinion, based on this, the government should first start with the root causes of environmental problems, severely punish environmental pollution behaviors, and improve environmental quality from the root causes so that residents can truly experience the improvement of environmental quality in real life. Secondly, the government needs to increase capital investment in environmental protection work, and encourage social capital to invest in the construction of the ecological environment, and unite multiple parties to work together to create an environment that protects the environment and enhance residents' environmental awareness. Finally, the full use of the Internet's regulatory functions can effectively reduce the release of false environmental news. At the same time, the use of the Internet's dissemination capabilities to publish environmental knowledge allows residents to independently distinguish false environmental information on the Internet, thereby helping to improve residents' subjective well-being.

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