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Francisco José García-Peñalvo
Alicia García-Holgado *Editors*

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The Association of Internet Use with Subjective Well-Being: An Empirical Study Based on CGSS 2017

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Abstract. With the rapid development of mobile Internet technology, the Internet has taken on an indispensable role in everyday life. There is a continuous debate regarding the relationship between internet use and subjective well-being. In contrast to observing whether one has access to the Internet, this paper focuses on Internet usages such as the frequency of use, range of social interaction, and network centrality. Based on the Chinese nationwide data collected in 2017, the results of the ordinary least squares regression model demonstrate that Internet use has a significant positive association with subjective well-being. In addition, by conducting heterogeneity tests, this study also discovers that Internet usage has different effects on different age groups; middle-aged people benefit from a higher frequency of Internet use and a large-scale network; the youth and the old adults benefit from their organizing communication groups.

Keywords: Internet use · Subjective well-being · CGSS 2017 · Heterogeneity analysis

1 Introduction

Subjective well-being is linked to a variety of positive outcomes, including improved health and longevity [1]. As a transformative force promoting social restructuring, does the Internet also contribute to individual subjective well-being [2]? The Internet has a wealth of information resources and a wide range of communication channels, which can help users to acquire different kinds of information, and develop social capital [3]. On the other hand, Internet use is thought to be related to online harassment, poor sleep quality, low self-esteem and poor body image [4].

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Many studies have focused on the influence of the Internet on subjective well-being, but the positive or negative association is uncertain [5]. In Gauteng province, the economic hub of South Africa, but only Internet access was an issue [6]. The issue of how people use the Internet and who uses it cannot be overlooked [7]. Besides, the relationship between Internet use and subjective well-being relies heavily on a sample of adolescents and young adults [5].

As of June 2021, China has a huge Internet user base of 1.011 billion people [8]. In the context of China, the purpose of this study is to explore the association of Internet use behaviors with personal happiness. This paper focuses on the behaviors of Internet use in relation to the frequency of use, range of interaction and network centrality. It also further explores the contribution of digital media to the enhancement of personal subjective well-being.

2 Literature Review

2.1 Subjective Well-Being

Subjective well-being is a holistic assessment of individuals' life quality based on internal criteria and is an important comprehensive psychological indicator of an individuals' life quality [9]. Subjective well-being contains three components: pleasant affect, unpleasant affect, and life satisfaction [9]. There are also empirical studies that have investigated different aspects of people's subjective well-being, such as 1) emotional aspect of well-being, experienced short-term positive or negative affect (like pleasure or anxiety); 2) evaluative or cognitive well-being, which is concerned with long term self-assessment of life satisfaction [10, 11]. Previous research has investigated that subjective well-being is significantly correlated with sociodemographic characteristics, including gender, income, age and education levels [12, 13] and married people are also happier and more satisfied with their lives than single people [14].

2.2 Internet Use Behaviors and Subjective Well-Being

There is a continuous debate regarding the relationship between Internet use and well-being. Internet is concerned to influence subjective well-being by changing the way time is used, facilitating access to information [15]. However, according to a comparative study between American and Finland teenagers, those who exposure to online hate material have lower levels of happiness [16]. Notably, according to an analysis of participants from 18 countries, the claim that excessive use of the internet decreases subjective well-being is not supported [17].

Based on Chinese data, mass media and lifestyle have direct influences on health, and lifestyle plays a mediating role between mass media and health in 2015 [18]. More recently, Internet usage is positively associated with subjective well-being based on the Chinese General Social Survey (CGSS) 2017 sample of older adults [19]. These also lead to the research questions in this paper:

RQ1: Does Internet use have an association with residents' subjective well-being in a representative all-age sample of the Chinese population?

With the rapid development of online platforms, individuals' Internet use behaviors cannot be measured by a single dimension of use intensity [20] and its relationship is therefore worth continuing to be explored. One study has found that when social media use increases by one hour, users' happiness decreases by an average of 0.17–0.22 [21]. However, from the data over time, web usage frequency has increased across age groups [22]. Therefore, we assumed the following hypothesis:

H1: A greater frequency of Internet use will be associated with a higher subjective well-being of individuals.

Evidence from many studies suggested that online communication expands relationship networks for communication and further enhances subjective well-being. In the research of 527 male adolescents in Northern Ireland, adolescents with more online friends are found to score higher on subjective well-being [23]. But the number of Facebook friends has an inverse U-shaped relationship with subjective well-being [24]. Following these results, we hypothesized the following:

H2: Individuals with a larger online relationship size have higher levels of subjective well-being.

In addition, peoples' position and influence in their relationship networks are also found to be associated with subjective well-being. People at the core of their networks seem more likely to be happy, while those on the peripheral seem more likely to be unhappy [25]. Meanwhile, managers will be able to send messages to a single team or the entire group at once [26]. They may experience a higher level of subjective well-being as a result of their role as the center of these dispersed groups of people with similar socialization needs. Following these previous findings, we postulated:

H3: Individuals in the online relationship centrality will have higher levels of subjective well-being.

Several scholars have focused on the relationship between individuals' Internet use behaviors and subjective well-being for different age groups. For the children sample, some researchers concluded that daily overuse of media might replace some beneficial actives through face-to-face communication [27]. A study examined how Facebook can reduce inequalities in well-being among undergraduates of a U.S. university [28]. Also, Internet use may enable the old people to maintain close intergenerational relationships with others, thereby improving their subjective well-being [29]. It can be seen that different age groups have different focuses on using the Internet, which in turn leads to different perceptions between their Internet use behaviors and subjective well-being. Following these results, we additionally asked a research question:

RQ2: Does Internet use have different effects on different age groups?

3 Methods

3.1 Data

This study uses data derived from the 2017 Chinese General Social Survey (CGSS). It is the earliest national, comprehensive, and continuous academic survey project, and the representative data about China's current social situation [30]. The 2017 CGSS data add modules such as network society and social network, which facilitate research on Internet usage behavior. The sample is composed of 2079 individuals with valid data.

3.2 Measures

3.2.1 Outcome Variable

Subjective well-being. The dependent variable was measured by asking respondents, in general, whether they think they have a happy life [31]. The only question to analyze the level of SWB is reliable, effective, and feasible [32]. The answer ranges from 1 (very unhappy) to 5 (very happy) (M = 3.90, SD = 0.79).

3.2.2 Predictor Variable

We consider three predictor variables. First, the frequency of Internet usage is measured by the question "In the past year, do you often surf the Internet in your spare time?" (M = 4.09, SD = 1.08). Second, the online relationship size is assessed based on the respondents' answers to the question about the number of people they connect with via the Internet every day (M = 3.12, SD = 1.20). Third, the online relationship centrality is measured by the respondents' answers regarding whether they organized the virtual communities, either organizing WeChat groups or QQ groups. The number of virtual communities they organized is valued (M = 0.98, SD = 3.05).

3.2.3 Control Variables

Demographic backgrounds acting as control variables include gender (0 = female, 1 = male), age (year), marital status (0 = single, divorced, or widowed, 1 = married), an education level, annual income (annual income last year transformed by natural logarithm). Previous literature showed that there is a U-shaped association between age and life satisfaction [33]. Thus, we include an age^2 variable to control for the non-linear effects of age.

4 Methods

4.1 Descriptive Analysis

Among the overall sample, 50.3% of the sample are females (N = 1046), and 49.7% are males. 76.1% are married. The average age of the whole sample is 41.9 years old (SD = 14.1), and they are educated for about 13.9 years (SD = 2.55). The average score for the frequency of Internet usage is 4.09, indicating that respondents surf the Internet several times a week or every day.

4.2 Regression Model Test

Model 1 explores the control variables on individual subjective well-being. Age is associated with strongly negative effects ($B = -.060$, $SE = .008$, $p < .001$); there is also a non-linear negative effect of age on subjective well-being. Education and income indicate a weak positive effect; respondents with higher education level and higher annual income feel happier ($B = .012$, $SE = .007$, $p < .1$; $B = .008$, $SE = .005$, $p < .1$). Being married is associated with significantly higher subjective well-being ($B = .418$, $SE = .048$, $p < .001$). However, individuals from different sex report insignificantly subjective well-being level.

Model 2 to 4 show the regression coefficients of Internet usage on the subjective well-being. As the frequency of Internet use increases by one unit, the probability of being happier increased by 0.05 ($B = .055$, $SE = .017$, $p < .01$). The explanatory of model 2 increases 0.005 compared to the model that only includes control variables. Model 3 shows that there is a significant association between the online relationship size and subjective well-being ($B = .039$, $SE = .015$, $p < .01$); respondents' online relationship centrality is also beneficial to subjective well-being ($B = .016$, $SE = .006$, $p < .01$). Model 4 presents positive associations between three aspects of Internet usage and subjective well-being ($B = .044$, $SE = .018$, $p < .05$; $B = .032$, $SE = .015$, $p < .05$; $B = .016$, $SE = .006$, $p < .01$). The explained variance increases to 0.056. Consequently, H1, H2 and H3 are supported.

4.3 Heterogeneity Analysis

The regression models show that age^2 is negatively correlated with the level of subjective well-being and reveal Internet usage may have different effects on different age groups. We group the sample into three age categories. Following the definition of the United Nations and previous studies [34], a young person is in the age under 40, middle-aged in 41 to 59, and an older adult is in the age range above 60. Table 1 represents the OLS regression results with age groups. Frequency of Internet use and the online relationship size show significant positive relationship with subjective well-being for middle-aged respondents but are not link to the subjective well-being of young person and older adults ($B = .063$, $SE = .026$, $p < .05$; $B = .043$, $SE = .025$, $p < .1$). Meanwhile, respondents' online relationship centrality has a significant relationship with subjective well-being for young person and older adults ($B = .015$, $SE = .007$, $p < .05$; $B = .020$, $SE = .012$, $p < .10$). Thus, a certain degree of heterogeneity exists in the subjective well-being of Internet use on individuals of different ages. Hence, the results answer the second research question in the affirmative.

Table 1. Heterogeneity of Internet use affecting subjective well-being

	Young group	Middle-aged group	The older group
	B (SE)	B (SE)	B (SE)
Gender	−0.022	−0.046	−0.015
	(0.050)	(0.057)	(0.093)
Edu	0.017 +	0.007	−0.011
	(0.010)	(0.012)	(0.018)
LnPInc	−0.004	0.006	0.024
	(0.006)	(0.008)	(0.022)
marriage	0.190***	0.590***	0.366**
	(0.052)	(0.099)	(0.116)
UIF	0.054	0.063*	−0.008
	(0.034)	(0.026)	(0.037)
Net_size	0.025	0.043 +	0.019
	(0.022)	(0.025)	(0.036)
Net_cen	0.015*	0.024	0.020 +
	(0.007)	(0.021)	(0.012)
_cons	3.222***	2.784***	3.615***
	(0.207)	(0.213)	(0.317)
N	1020	792	267
R^2	0.026	0.068	0.053

Note: + p < .1; * p < .05; ** p < .01; *** p < .001

5 Discussion

The results support our prediction that the frequency of Internet use is positively associated with subjective well-being. The results demonstrate that online relationship size and online relationship centrality are positively related to subjective well-being, which, to some extent, reveals that social support may contribute to subjective well-being. The findings are in accord with studies indicating that communication via the Internet broadens the scope of personal socialization, enhances interpersonal conversation, and thus improves social relations and perceived quality of life [35].

Furthermore, a meaningful difference is observed among the age groups of respondents. A previous research suggested that teenagers' friendship group hope is an important factor in improving subjective well-being [36]. In addition, the current study indicates that online relationship centrality has a more obvious association with subjective well-being in the young group; the online relationship size is weak positively linked to the subjective well-being of the middle-aged group.

But, a higher frequency of Internet use is not linked with greater subjective well-being, which may be related to increased skill requirements for the old [37]. In addition, the old organizing more virtual communities enjoy a higher level of subjective well-being. The Internet has been utilized extensively and innovatively, and the old are involved in learning new technologies.

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