The Impact of Internet Use on Community Participation of Older Adults: Evidence From China

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Abstract
This article explores the association between Internet use and community participation of older adults using data from the China Longitudinal Aging Social Survey (CLASS) in 2016. The empirical results indicate that there is a significant positive association between Internet use and the intention of community participation of older adults. Moreover, mediating effect investigation shows that Internet use promotes the intention of community engagement of the older adults by improving subjective health. The benchmark results are still consistent after addressing the potential endogeneity by employing propensity score matching method. Finally, subsample analysis suggests no significant difference in this positive effect between urban and rural older adults.

Keywords
older adults, community participation, Internet use

Introduction
According to The Seventh National Census in China, the percentage of people over 60 years old has reached 18.70% of the national population. The aging of Chinese society is deteriorating. With the rapid development of the Internet, the number of Chinese netizens had reached 989 million by December 2020. Moreover, Internet penetration has increased to 70.4% from 59.6% in December 2018. The proportion of older adults over 60 using the Internet rose from 6.6% to 11.20%. The Internet in the daily life of the elderly is becoming increasingly important. As a specific group, once people enter old age, it means that they begin to be out of touch with society and even lag the current social development. Now, the Internet has become an indispensable medium for them to keep connected to society, so how to meet the higher level of needs of the elderly is gradually becoming one of the goals of the general concern of society.

In the background of the rapid development of the Internet, how to make full use of information technology to mitigate the negatives effects of aging has been raised to the height of national development strategies. In 2019 China’s State Council issued the National Medium and Long-term Plan for Actively Coping with Population Aging, which proposes a service system based on family and community, combining medical treatment with the pension.

As people grow older, their physical functions begin to deteriorate, and the range of movement is limited. The community is the primary place for older adults to interact with each other and the outside world. Community participation of older adults is a way to achieve further self-worth through life and emotional satisfaction in community participation while being physically healthy. (Gao et al., 2019). With the continuous improvement of economic and material life, older people are no longer content with basic physiological and security needs. Participation in community activities can bring the elderly a higher sense of belonging and respect, even self-fulfillment (Ju & Li, 2020). Internet use can refigure the social life of older adults across spatial limitations and actively address the challenges of aging (Jin & Zhao, 2019). Extensive studied have investigated the impact of Internet use on the wellbeing of older adults (Cohall et al., 2011; Moult et al., 2018).

Promoting community participation of older adults is an active response to aging in China. This study will provide an important reference for understanding the relationship between Internet use and community participation of older adults in China. To this end, this article uses data from the 2016 China Longitudinal Aging Social Survey (CLASS) with the older adults as the observation subject. We empirically analyzed the effects and mechanisms of Internet use on community participation of older adults in China.

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This study may contribute to relevant literature in several aspects. First, looking into the relationship between Internet use and community participation of older adults, it fills the gaps of previous studies. Second, mediating effect investigation allows us to understand the mechanisms how Internet use affects community participation of older adults. Finally, large sample adopted in this paper guarantees high representativeness of the data and reliability of the study findings.

**Literature Review**

Research on the impact of Internet use of older adults is increasing as the enhancement of Internet penetration and deepening of aging society, such as physical and mental health, life satisfaction, happiness, and loneliness. It was a well-established fact that Internet use can significantly improve the physical and mental health of older adults (L. J. Wang, 2018; Zhao & Liu, 2020), since older adults have access to more health knowledge and information through the Internet, which improves their physical health. Many older adults tend to view the Internet as a tool for health maintenance (Cohall et al., 2011; Moul et al., 2018). Internet use significantly increases the life satisfaction of older adults (Du & Wang, 2020; Szabo, 2019; Zhou & Wang, 2020), and older adults who use the Internet have a stronger sense of subjective well-being than those who do not (Peng et al., 2019). Loneliness, as an adverse psychological experience that older adults are prone to have a series of negative impacts on their physical and mental health. Some studies have shown that Internet use shows a significant negative correlation with the loneliness of older adults, which means that Internet use among older adults can bring about a significant reduction in individual loneliness (Song et al., 2019). Internet use can help older adults prevent social isolation (Chopik, 2016; Khorosavi et al., 2016) and allow older adults to remain socially active (Choi et al., 2014; Hill et al., 2015; Leukel et al., 2017).

In response to the “active aging” policy, community participation of older adults is becoming a focus of aging research. Community participation in a broad sense refers to the intention and behavior of community residents to participate in community activities. Different studies have defined community participation of older adults in different ways, which mainly include three categories: first, according to different perspectives of participation content and social interaction, some scholars classify it into political and non-political community participation (Han, 2021); others directly classify it into political, economic, social, and cultural aspects according to participation content (Xie et al., 2021). Second, they are classified according to participants’ intentions, their own characteristics, and abilities, such as some scholars classify them into active participation and passive participation (Han, 2021); others classify them into collective participation, productive participation, and political participation according to older people’s own social networks and ability to access resources (Bukov et al., 2002; Song et al., 2020). Third, according to the motivation of participation and the sense of belonging to the community, it can be divided into “participation for others” and “participation with personal purpose” (Duan & Zhang, 2008). Community participation of the elderly should pay more attention to the subjective consciousness and objective ability of the elderly, and meet the material and spiritual cultural needs of the elderly when physical conditions allow.

Moreover, many factors affect the community participation of older adults. Some studies have shown that older adults who participate in intergenerational care are more likely to be active in the community (Ma & Lin, 2020; McNamara et al., 2011). It has also been found that intergenerational in dual-earner families significantly reduces the possibility of community participation of older adults (Ho, 2015; C. Wang et al., 2011). In addition, previous research has found that demographic characteristic variables are associated with community participation. These include age (Ponce et al., 2014; Szanton et al., 2015), gender (Shen, 2017; Szanton et al., 2015), education (King et al., 2017), marital status (Bastos et al., 2015), and physical condition (Szanton et al., 2015) had significant effects on the motivation to participate in community activities.

In addition, some studies have paid attention to the relationship between Internet use and community involvement of older adults. Most studies found that information technology leads to greater social engagement in older adults over 60 years old in the United States (Ihm & Hsieh, 2015; Kim et al., 2016). Which showed that IT use among older adults was positively associated with outdoor activity. Advances in information technology have broken the limits of people’s interaction space (Yuan et al., 2019). He and Yan (2022) found that Internet use significantly reduces the probability of both public- and private-benefit community participation among older adults. Moreover, the motivations and patterns of Internet use among older adults affect their community participation behaviors (Baker et al., 2018; Chiu, 2019).

By reviewing the literature on the relationship between Internet use and community participation, we find that scholars are particularly interested in the impact of the Internet on offline communities (Matei, 2001; Putnam, 1995). Early research took a purely technical approach, reflecting two widely divergent perspectives. Based on displacement theory, some scholars argue that Internet use competes with local community activities and that Internet use serves as a substitute for offline community activities, while researchers of the other view argue that the Internet serves as a strong link to fading community relationships (Dutta-Bergman, 2004). Previous studies have emphasized the role of technology and ignored the group differences and drivers of community engagement.

In the context of China’s rapid aging and the increasing popularity of information technology, this paper divides community participation into community participation...
intentions behavior and community participation behavior, and explores the impact of Internet use on older adults’ community participation from the perspective of their Internet use and further analyzes its impact path.

**Data**

The data of this study is from the China Longitudinal Aging Social Survey (CLASS) in 2016, which was collected by the China Survey and Data Center and the Institute of Gerontology, Renmin University of China. It is a national social survey that focuses on the health, family status, social background, and economic status of older adults over 60 years old. The questionnaire was designed according to the cognitive level of the elderly and used a stratified multi-stage sampling method. The survey was conducted in 462 residential areas from 134 counties. After deleting the samples with missing values of main variables, this study obtains 11,511 valid samples.

**Measurements**

**Internet use.** The Internet use of older adults are measure with three indices, whether they access the Internet frequently (Jin & Zhao, 2019), frequency of using the Internet (Leukel et al., 2017), and the Internet as a primary source of information (Schehl, 2020). The frequency of Internet use is to measure the extent to which the older adults use the Internet, which is divided into five categories: never, rarely, sometimes, often, and always, with values from 0 to 4 assigned in increasing order. The rest measures are dummy variables with the values of 1 if answer is “yes,” 0 otherwise.

**Community participation.** The dependent variable in this study is the community participation of the older adults. It is measured by the subjective intention and objective ability of the older adult. Therefore, community participation is defined as the intention to participate in the community and the actual participation in the community behavior, respectively.

The intention to participate in the community is selects based on the answers to the following question in the questionnaire: “If given the opportunity, how willing would you be to participate in certain tasks of the village/neighborhood council?” Which was divided into five categories: not at all willing, not willing, average, willing, and completely willing. In addition, the questionnaire defined the question on community participation behaviors as follows: “Have participated in community policing patrols, caring for other elderly people (e.g., helping with shopping, personal care, etc.), environmental health protection, mediating disputes, accompanying chats, volunteering services that require specialized skills (e.g., volunteer clinics), helping to look after other people’s children, and other community activities.” The researcher identified older adults who had participated in any one or more of these as community participation behaviors. Table 1 presents the specific descriptions of the core variables in this article.

**Controls.** There are known studies that have shown that the marital status, education, asset, and residence type of older adults can directly or indirectly affect the enthusiasm of community participation (Lin, 2016). Therefore, the above factors are controlled in this paper. Specifically, the age is calculated by the year of birth of the elderly. Gender was defined as female or male. Education was measured by asking older adults about their highest level of education. This question provided six specific options (illiterate, private school/literacy class, elementary school, middle school, high school/junior college, college, and above). The numerical value increases with the education level. Based on the answers received, researchers grouped the married respondents into one category and the others into one; the type of residence of the older adults into urban and rural; family size refers to the number of family members who live with the respondents regularly (eat to live together, including themselves).

### Table 1. Description of Main Variables.

| Variable                  | Question                                                                 | Definition                                                                 |
|---------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Behavioral intention      | If given the opportunity, how willing would you be to participate in certain tasks of the village/neighborhood council? | Not at all willing = 0, not willing = 1, average = 2, willing = 3, completely willing = 4 |
| Participation behavior    | Have you participated in community policing patrols, caring for other elderly people (e.g., helping with shopping, personal care, etc.), environmental health protection, mediating disputes, accompanying chats, volunteering services that require specialized skills (e.g., volunteer clinics), helping to look after other people’s children, and other community activities. | Participated = 1; Never = 0 |
| Often online              | Are you using the Internet regularly?                                    | Yes = 1; No = 0                                                             |
| Information sources       | Does Internet is your main information source?                           | Yes = 1; No = 0                                                             |
| Internet frequency        | ? How often do you currently use the Internet?                           | Never = 0, rarely = 1, sometimes = 2, often = 3, always = 4 |
**Specification**

To summarize, the community participation of the older adults studied in this paper is divided into community participation behavioral intention and community participation behavior, which are ordered variables and binary variables, respectively. So, the multiple ordered Probit regression model is selected as the benchmark regression model to analyze the community participation behavioral intention of the older adults; To test the influence of Internet use on community participation behavior, using a logit model for regression. The basic form of the ordered Probit model is as follows.

\[ Y_i^* = \alpha_0 + \beta_0 \text{Internet}_i + \gamma Z_i + \epsilon_i \]  
\[ Y_i = \begin{cases} 1, & Y_i^* \leq A_1 \\ 2, & A_1 < Y_i^* \leq A_2 \\ 3, & A_2 < Y_i^* \leq A_3 \\ 4, & A_3 < Y_i^* \leq A_4 \\ 5, & A_4 < Y_i^* \end{cases} \]  
\[ P(Y_i = 1) = \Phi(A_1 - X \beta_0) \]  
\[ P(Y_i = 2) = \Phi(A_2 - X \beta_0) - \Phi(A_1 - X \beta_0) \]  
\[ P(Y_i = 5) = 1 - \Phi(A_4 - X \beta_0) \]  

Where, \( Y_i^* \) represents the latent variable of the intention of older adults to participate in the community, \( \text{Internet}_i \) means Internet use, \( Z_i \) is the covariate that affects community participation of older adults and \( \epsilon_i \) is a random disturbance term in (1). Formula (2), \( Y_i \) measures the Intention of community participation and \( A_1 < A_4 \) are the parameters to be estimated. When \( \epsilon_i \) obeys the normal distribution, the multivariate ordered Probit model can be obtained by the derivation of equation (2) and \( Y_i \) can be expressed as equation (3).

Binary selection model specification. This \( p_i \) refers to the probability that the \( i \)th old adult participates in community activities.

\[ \ln \left( \frac{p_i}{1 - p_i} \right) = \alpha_i + \alpha_1 \text{Internet}_i + \beta_1 Z_i + \mu_i \]  

**Results**

**Descriptive Statistics**

Respondents are all over 60 years old. Excluding the missing values of core variables and invalid data such as “don’t know” and “refused to answer” in the questionnaire, the final valid number of samples remained was 8,856. Among them, the older adults who used the Internet in the past 3 months accounted for 16.32% of the sample. In this survey, older adults who had participated in community activities account for 10.9% of the sample, which means that the older adults have a low community participation rate. However, the average value of the respondents’ intention to participate in the community is higher than the numerical mean value, indicating the phenomenon of “high willingness and low participation,” which is consistent with the existing research conclusions (Xie, 2017). About control variables, the average age was 70.20 (standard deviation (SD) = 7.557). The sample is balanced in terms of gender. About 62.74% of respondents living in urban and married respondents accounted for 71.6% of the sample. The specific data are shown in Table 2.

**Benchmark Results**

*Intention for community participates of older adults.* Table 3 reports the regression results using the intention of older adults to participate in the community as the dependent variable. The coefficients of the proxy variables for Internet use are all significantly positive at the 1% level, which means that Internet use can improve the intention of the older adult to participate in the community. Older adults using the Internet regularly are more willing to participate in the community than those who do not. A unit increase in the frequency of Internet use leads to the increase of the intention of the old adults to engage in the community by 17.7%. Older adults who use the Internet as the primary source of information are 50.5% more strongly motivated to participate in their communities than other older adults.

Concerning control variables, education is one of the important factors affecting the community participation of older adults. The coefficients for education indicate a positive relationship of community participation of older adults at the 1% level, implying that the higher the level of education of the elderly, the stronger the willingness to participate in the community. Education can affect older adults’ understanding of community institutions and norms and change their intentions and behaviors to participate in the community (Cong et al., 2020).

*community participates behaviors of older adults.* Table 4 shows the influence of Internet use on the community participation behavior of older adults. *Often online and Internet frequency* significantly stimulated the older adults to participate in community activities at the 1% level. The Information source was significantly positive at the 5% level. Overall, the use of the Internet has significantly increased the probability of community participation of older adults. However, many factors need to be considered for older adults to participate in community activities, such as physical condition, family support, and schedule. Therefore, the phenomenon of “high
willingness, low participation” has emerged in some areas of China (Xie, 2020).

Regarding control variables, the coefficient of the Residence Types shows that older adults living in urban are significantly more likely to participate in community activities than those living in rural. According to the statistics of the survey data in this paper, only 38.76% of the rural older adults live in communities with places or facilities such as elderly activity rooms, fitness rooms, chess, and card (mahjong) rooms, libraries, or outdoor activity venues. However, 72.86% of older adults in urban life in communities with these places. In contrast, the coefficient for household size is significantly negative, which suggests that older adults in larger households are less likely to participate in community activities.

**Robustness Tests**

To avoid the effects of endogenous problems and ensuring the reliability of results on the impact of Internet use on community participation of older adults. The study employs propensity score matching (PSM) to test the robustness of the benchmark regression. The propensity score matching method is a reasonable comparison of the experimental and control groups through a counterfactual inference model that eliminates confounding factors between the groups.

The treatment variable for PSM is “whether to use the Internet.” We set the older adults who used the Internet as the treatment group, while those who do not use the Internet were the control group. Also, the outcome variable is “the community participation behavior.” When the treatment group matches one or more individuals with similar characteristics in the control group, the difference in community participation behavior between the two groups is the Average Treatment Effect on the Treated (ATT) as reflected by the treatment event. We obtain ATT by three methods: four-nearest-neighbor matching, caliper matching, and kernel matching.

As shown in Table 5, the $t$-test results after matching are not significant. Moreover, the standardized %bias is less than 10% after matching. That implies that passing the balance test and meet the basic requirements of Propensity Score Matching. Figure 1 displays the change in standardized %bias of the variables before and after matching. Compared with the before matching, the standardized %bias of the variables after matching is significantly smaller.

Table 6 reflects the propensity score matching the results of the treatment effect. When sample selection bias is eliminated for the control and treatment groups, ATT derived from the three methods are 0.145, 0.141, and 0.143. The signs and significance of the regression coefficients obtained based on different matching methodology converge, indicating that the results are highly robust. That suggests a real and significant positive effect of Internet use on the community participation of older adults.

**Mechanism analysis**

We explored and validated the impact of Internet use on community participation of older adults. Next, this section will discuss how does Internet use contributes to community participation. Previous studies have shown that Internet use improves the health condition of older adults (Hunsaker & Hargittai, 2018; L. J. Wang, 2018). In addition, considering
that community participation behavior is based on physical status, older adults who are healthier are more likely to participate in community activities (Szanton et al., 2015). Thus, we attempted to demonstrate that the health of older adults mediates the impact of Internet use on community participation.

To test whether subjective health is the medium of Internet use affecting the community participation of older adults. This study selects subjective health as the mediating variable, which is classified as “very unhealthy, relatively unhealthy, average, relatively healthy, and very healthy.” It is important to emphasize that path $a$ represents the effect of Internet use on the subjective health of older adults, path $b$ stand for the impact of subjective health on community participation, and path $c$ measures the total effect of community participation. We build the following specification.

$$Y_i = \theta_1 + cX_i + control_X + \epsilon_i \tag{6}$$

$$M_i = \theta_2 + aX_i + control_X + \epsilon_2 \tag{7}$$

$$Y_i = \theta_3 + c'X_i + bM_i + control_X + \epsilon_3 \tag{8}$$

Where, $Y_i$ indicates community engagement of older adults and $X_i$ represents Internet use. $M_i$ as mediating variable in equation (7). The point to note is that this paper involves the partial mediation effect.

Figure 2 presents the regression results of the mediating effects. We can find that path $a$, path $b$, and path $c$ coefficients are significant, suggesting the mediating effect exists. The results of path $a$ indicate a significant positive impact of Internet use on the subjective health of older adults. Older adults who are healthier are more likely to participate in community activities (Szanton et al., 2015).

**Table 3. The Impact of Internet Use on Community Participates Intention (Oprobit).**

| Variables            | (1)          | (2)          | (3)          |
|----------------------|--------------|--------------|--------------|
| Often online         | 0.448*** (0.0556) |              |              |
| Internet frequency   |              | 0.177*** (0.0190) |              |
| Information source   |              |              | 0.505*** (0.0774) |
| Age                  | -0.00919*** (0.00278) | -0.00843*** (0.00278) | -0.0107*** (0.00276) |
| Gender               | 0.00405 (0.0368) | 0.00691 (0.0368) | -0.0145 (0.0367) |
| Married              | -0.0423 (0.0454) | -0.0505 (0.0454) | -0.0408 (0.0454) |
| Education            | 0.130*** (0.0162) | 0.125*** (0.0162) | 0.141*** (0.0160) |
| Household assets     | 0.0146 (0.0141) | 0.0167 (0.0141) | 0.0198 (0.0140) |
| Family size          | 0.0104 (0.0143) | 0.0127 (0.0144) | 0.00798 (0.0143) |
| Residence type       | 0.0226 (0.0435) | 0.0152 (0.0435) | 0.0432 (0.0433) |
| Observations         | 3,510         | 3,510         | 3,510         |

Note. Standard errors in parentheses.

*p < .1, **p < .05, ***p < .01.

**Table 4. The Impact of Internet Use on Community Participates Behaviors (Logit).**

| Variables            | (1)          | (2)          | (3)          |
|----------------------|--------------|--------------|--------------|
| Often online         | 0.989*** (0.140) |              |              |
| Internet frequency   |              | 0.358*** (0.0465) |              |
| Information source   |              |              | 0.440** (0.192) |
| Age                  | -0.0242*** (0.00925) | -0.0232** (0.00928) | -0.0329*** (0.00917) |
| Gender               | 0.0412 (0.113) | 0.0381 (0.113) | -0.0266 (0.112) |
| Married              | 0.143 (0.147) | 0.126 (0.147) | 0.147 (0.145) |
| Education            | -0.0705 (0.0509) | -0.0832 (0.0511) | -0.00485 (0.0500) |
| Household assets     | 0.0460 (0.0455) | 0.0573 (0.0452) | 0.0684 (0.0456) |
| Family size          | -0.115*** (0.0474) | -0.111** (0.0475) | -0.120*** (0.0469) |
| Residence type       | 0.304*** (0.144) | 0.291** (0.144) | 0.379*** (0.142) |
| Constant             | -0.878 (0.784) | -1.386* (0.795) | -0.570 (0.776) |
| Observations         | 3,510         | 3,510         | 3,510         |

Note. Standard errors in parentheses.

*p < .1, **p < .05, ***p < .01.
adults can gain health-related knowledge or skills by consulting directly on health issues through the Internet (Cresci et al., 2012). The comparison of the coefficients of path b reveals that although both are significant, the effect of subjective health on older adults’ willingness to participate in the community is more pronounced. Subjective health is the respondent’s evaluation of self-health and does not include the health level tested by professional medical institutions. The primary prerequisite for actual community participation is that older adults are as healthy as their health allows, so the effect of subjective health on older adults’ willingness to participate in the community would be more direct. Finally, the mediating effect mechanism that Internet use enhances older adults’ subjective health and thus their willingness and behavior to participate in the community was verified.

Impact of Internet Use on Community Participation of Older Adults in Urban and Rural

In China, urban neighborhoods and rural neighborhoods are usually identified from the perspective of geographical division. Given the differences of community identity between urban and rural elderly. We explored the impact of Internet use on community participation for urban and rural older adults using data from a nationwide sample of older adults, respectively.

As shown in Table 7, Internet use can significantly enhance the willingness of urban and rural elderly to participate in the community. Specifically, the regression coefficient of Information sources is significant in urban, but not in rural, which means that the Internet as the primary source of information has no impact on the rural elderly. This finding is consistent with the previous study. (Schehl, 2020). Older adults living in rural neighborhoods have a stronger sense of community (Kitchen et al., 2012). A smaller range of activities depends more on their traditional sources of information, such as neighborhood interaction and information networks of friends and family.

Table 8 presents the results of community participation behavior of older adults in urban and rural. There is less variation in the impact of Internet use on the community participation behavior of older adults. Taking a closer look at the influence of Internet use on the urban elderly community participation behavior is more significant. Compared with Internet information sources, the rural elderly is more dependent on traditional information sources (Xu & Huang, 2021). On the other hand, the rural people must farm and cultivate to take up the time for community participation. The form and platform of rural community activities lack some standardization compared to urban communities. However, rural
neighborhoods’ close degree is high, more convenient to carry out community activities.

**Conclusion**

This study explores the impact of Internet use on the community participation of older adults. We use the ordering model and the discrete choice model to verify this idea based on the 2016 China Longitudinal Aging Social Survey (CLASS). In addition, this paper further discussed the robustness test, mechanism analysis, and heterogeneity test. Which effectively enriches the understanding of the existing research on the Internet and community participation of older adults.

The empirical findings are summarized as follows. First, the association between Internet use and older adults’ intention to participate in the community and their actual participation in the community was positive and significant. After
addressing the endogeneity problem, and the benchmark results are still consistent. Furthermore, Internet use can improve the subjective health of the elderly and further promote community participation, which verifies the mediating role of subjective health in the process of Internet use affecting the community participation of the old adults. Finally, there is no significant difference in the impact of Internet use on the community participation of older adults in urban and rural.

The findings of this paper are of some practical significance, the researcher makes several policy recommendations based on the empirical results. First, companies should design smart devices that are portable and easy to operate to meet the needs of the elderly to access the Internet and use it. Second, the government can subsidize seniors when they purchase smart devices. Third, the government should organize volunteers to help the elderly learn to use smart devices such as cell phones. Finally, government departments need to further improve community service systems and policies to provide opportunities and platforms for seniors to engage in community participation.

This study has some limitations and needs to be improved in the following aspects. First, since changes in older adults’ behavior are a long-term and continuous occurrence, panel data are beneficial to obtain results that would be more convincing. What’s more, because of the limitations of the questionnaire, the researcher was unable to explore the specific effects of Internet use on different motivations and domains of community participation of older adults.

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**References**

Baker, S., Warburton, J., Waycott, J., Batchelor, F., Hoang, T., Dow, B., Ozanne, E., & Vetere, F. (2018). Combatting social isolation and increasing social participation of older adults through the use of technology: A systematic review of existing evidence. Australasian Journal on Ageing, 37, 184–193.

Bastos, A. M., Faria, C. G., Moreira, E., Morais, D., Melo-de-Carvalho, J. M., & Paul, M. C. (2015). The importance of neighborhood ecological assets in community dwelling old people aging outcomes: A study in Northern Portugal. Frontiers in Aging Neuroscience, 7, 156.

Bukov, A., Maas, I., & Lampert, T. (2002). Social participation in very old age: Cross-sectional and longitudinal findings from BASE. Berlin Aging Study. The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 57(6), B510–PS17.

Chiu, C. J. (2019). Relationship between internet behaviors and social engagement in middle-aged and older adults in Taiwan. International Journal of Environmental Research and Public Health, 16(3), 416.

Choi, J. H., Kim, S., Moon, J. Y., Kang, J., Lee, I., & Kim, J. (2014). Seek or provide: Comparative effects of online information sharing on seniors’ quality of life. Communications of the Association for Information Systems, 34(1), 513–530.

Chopik, W. J. (2016). The benefits of social technology use among older adults are mediated by reduced loneliness. Cyberpsychology, Behavior, and Social Networking, 19(9), 551–556.

Cohall, A. T., Nye, A., Moon-Howard, J., Kukafka, R., Dye, B., Vaughan, R. D., & Northridge, M. E. (2011). Computer use, internet access, and online health searching among Harlem adults. American Journal of Health Promotion, 25(5), 325–333.

Cong, M., Guo, N., Zhang, X. J., & Gao, Y. (2020). Research on the path of urban older people’s participation in community volunteering activities: An empirical study based on Tianjin. Theory and Modernization, 5, 109–120. (In Chinese).

Cresci, M. K., Jarosz, P. A., & Templin, T. N. (2012). Are health answers online for older adults? Educational Gerontology, 38(1), 10–19.

Du, P., & Wang, B. (2020). How does internet use affect the life satisfaction of older adults in China? Population Research, 44(4), 3–17. (In Chinese).

**Table 8. Impact Results of Community Participation Behavior by Residence Type (Logit).**

| Variables                  | (1)     | (2)     | (3)     | (4)     | (5)     | (6)     |
|---------------------------|---------|---------|---------|---------|---------|---------|
| Observations              | 2,475   | 1,146   | 2,475   | 1,146   | 2,475   | 1,146   |
| Constant                  | -0.193  | -0.325  | -0.668  | -0.838  | 0.278   | -0.346  |
| (1)                       | (0.926) | (1.516) | (0.939) | (1.529) | (0.913) | (1.524) |
| Internet frequency        |         |         | 0.351***| (0.050) | 0.546***| (0.126) |
| Information sources       |         |         |         |         | 0.515** | (0.201) |
| (2)                       |         |         |         |         |         | 0.227   |
| (3)                       |         |         |         |         |         | (0.752) |
| Often online              | 1.083***| (0.149) |         |         |         |         |
| (4)                       | 0.858** | (0.420) |         |         |         |         |

*Note. Standard errors in parentheses. Control variables are controlled.*

*p < .1, **p < .05, ***p < .01
Duan, S. J., & Zhang, H. (2008). A study on the conceptual and theoretical basis of social participation of the elderly. *Journal of Hebei University College of Adult Education, 3*, 82–84. (In Chinese).

Dutta-Bergman, M. (2004). Complementarity in consumption of news types across traditional and new media. *Journal of Broadcasting & Electronic Media, 48*(1), 41–60.

Gao, C. C., Hu, X. T., & Huang, M. H. (2019). Analysis of the path of social participation of the elderly in the perspective of active aging. *Labor Security World, 17*, 52–54.

Han, Y. L. (2021). *A study on community participation of the elderly in the process of community creation*. Beijing University of Civil Engineering and Architecture.

He, H., & Yan, C. Y. (2022). Segregation or integration: A study of the impact of internet use on community participation of Chinese elderly. *Population Journal, 2*, 72–84.

Hill, R., Betts, L. R., & Gardner, S. E. (2015). Older adults’ experiences and perceptions of digital technology: (Dis)empowerment, wellbeing, and inclusion. *Computers in Human Behavior, 48*, 415–423.

Ho, C. (2015). Grandchild care, intergenerational transfers, and grandparents’ labor supply. *Review of Economics of the Household, 13*(2), 359–384.

Hunsaker, A., & Hargittai, E. (2018). A review of Internet use among older adults. *New Media & Society, 20*(10), 3937–3954.

Ihm, J., & Hsieh, Y. P. (2015). The implications of information and communication technology use for the social well-being of older adults. *Information, Communication & Society, 18*(10), 1123–1138.

Jin, Y. A., & Zhao, M. H. (2019). Internet use and active aging among older adults in China: Analysis based on data from China Longitudinal Aging Social Survey in 2016. *Population Journal, 41*(6), 44–55. (In Chinese).

Ju, C. Y., & Li, K. (2020). “Having something to fall back on after aging”: Active aging in community governance participation. *The Journal of Humanities, 6*, 112–119. (In Chinese).

Khosravi, P., Rezvani, A., & Wiewiora, A. (2016). The impact of technology on older adults’ social isolation. *Computers in Human Behavior, 63*, 594–603.

Kim, J., Lee, H. Y., Christensen, M. C., & Meriggi, J. R. (2016). Technology access and use, and their associations with social engagement among older adults: Do women and men differ? *Journals of Gerontology Series B. Psychological Sciences and Social Sciences, 72*(5), 836–845.

King, A. C., Salvo, D., Banda, J. A., Ahn, D. K., Chapman, J. E., Gill, T. M., Fielding, R. A., Demons, J., Tudor-Locke, C., Rosso, A., Pahor, M., & Frank, L. D. (2017). Preserving older adults’ routine outdoor activities in contrasting neighborhood environments through a physical activity intervention. *Preventive Medicine, 96*, 87–93.

Kitchen, P., Williams, A., & Chowhan, J. (2012). Sense of community belonging and health in Canada: A regional analysis. *Social Indicators Research, 107*(1), 103–126.

Leukel, J., Schehl, B., Wallraff, S., & Hübli, M. (2017, December 10–13). *Impact of IT use by older adults on their outdoor activities* [Conference session]. International Conference on Information Systems.

Lin, W. Y. (2016). A study of factors influencing community participation of older adults: An analysis based on data from the 2011 China health and retirement longitudinal study (CHARLS). *Scientific Research on Aging, 49*(9), 16–26. (In Chinese).

Ma, L., & Lin, S. M. (2020). Does intergenerational care reduce community participation of older adults? An analysis based on data from the 2014 China Longitudinal Aging Social Survey. *Scientific Research on Aging, 8*(5), 42–53. (In Chinese).

Matei, S. (2001). *The magnifying glass effect: Negotiating individualism and community on the internet* [Unpublished doctoral dissertation]. University of Southern California.

McNamara, T. K., & Gonzales, E. (2011). Volunteer transitions among older adults: The role of human, social, and cultural capital in later life. *Journals of Gerontology Series B. Psychological Sciences and Social Sciences, 66*(4), 490–501.

Moult, A., Burroughs, H., Kingstone, T., & Chew-Graham, C. A. (2018). How older adults self-manage distress: Does the internet have a role? A qualitative study. *BMC Family Practice, 19*(1), 185–193.

Peng, X. Z., Lv, M. Y., & Lu, M. H. (2019). Does use the Internet make older adults feel happier? An empirical study from CGSS data. *Nanjing Journal of Social Sciences, 10*, 57–68. (In Chinese).

Ponce, M. S. H., Rosas, R. P. E., & Lorca, M. B. F. (2014). Social capital, social participation and life satisfaction among Chilean older adults. *Revista De Saude Publica, 48*(5), 739–749.

Putnam, R. D. (1995). Bowling alone: America’s declining social capital. *Journal of Democracy, 6*(1), 65–78.

Schehl, B. (2020). Outdoor activity among older adults: Exploring the role of informational internet use. *Educational Gerontology, 46*(1), 36–45.

Shen, N. Q. (2017). Factors influencing community participation of urban older adults based on a two-way perspective of macro and micro. *Seek Truth From Facts, 2*, 61–64. (In Chinese).

Song, L. J, Lv, M. Y., & Tang, H. (2020). A study on the factors influencing “productive participation” of the elderly based on a hierarchical linear model. *Population and Development, 6*, 25–39. (In Chinese).

Song, S. Z., Song, X. K., & Zhao, Y. X. (2019). The effect of internet use on the alleviation of loneliness among older adults: An empirical study based on CHARLS data. *Library and Information, 1*, 63–69. (In Chinese).

Szabo, A., Allen, J., Stephens, C., & Alpass, F. (2019). Longitudinal analysis of the relationship between purposes of internet use and well-being among older adults. *Gerontologist, 59*(1), 58–68.

Szanton, S. L., Walker, R. K., Roberts, L., Thorpe, R. J., Wolff, J., Agree, E., Roth, D. L., Gitlin, L. N., & Seplaki, C. (2015). Older adults’ favorite activities are resoundingly active: Findings from the NHATS study. *Geriatric Nursing, 36*(2), 131–135.

Wang, C., Gallo, R. E., Fleisher, L., & Miller, S. M. (2011). Literacy assessment of family health history tools for public health prevention. *Public Health Genomics, 14*, 222–237.

Wang, L. J. (2018). A study on the mechanism of the impact of Internet use on physical and mental health of the older adults: An empirical analysis based on CGSS (2013) data. *Modern Economic Research, 4*, 101–108. (In Chinese).

Xie, L. L. (2017). A study on the current situation and influencing factors of community volunteerism participation of Chinese urban elderly. *Population and Development, 1*, 55–65+73. (In Chinese).
Xie, L. L. (2020). Factors influencing urban elderly people’s participation in community governance from the perspective of individual-environment matching: A survey based on Beijing. *Population Research, 44*(3), 71–84. (In Chinese).

Xie, L. L, Wang, F., & Hu, K. (2021). Social participation patterns of Chinese older adults and their impact on social adaptation. *Population Research, 5*, 49–63. (In Chinese).

Xu, Y., & Huang, Y. (2021). Chinese middle-aged and older adults’ internet use and happiness: The Mediating roles of loneliness and social engagement. *Journal of Applied Gerontology, 40*, 1846–1855.

Yuan, H., & Xie, K. X. (2019). The impact of urban residents’ internet behavior on community participation of urban residents. *Urban Problems, 4*, 81–87. (In Chinese).

Zhao, J. G., & Liu, Z. Q. (2020). The impact of internet use on the health of older adults. *Chinese Journal of Population Science, 5*, 14–26+126. (In Chinese).

Zhou, X. J., & Wang, X. H. (2020). The influence of internet usage on life satisfaction of rural older adults: Empirical analysis based on CLASS 2016 data. *Journal of Fujian Agriculture and Forestry University (Philosophy and Social Sciences), 23*(6), 70–78. (In Chinese).