An Empirical Analysis of the Influence of the Urban Elderly Group's Psychological Factors on the Digital Divide under the Background of Digital Governance: Based on the Investigation and Research of Z City in Zhejiang Province

Zehui Wu

Zijingang Campus, Zhejiang University, Sandun Town, Xihu District, Hangzhou City, Zhejiang Province, China

3179801008@zju.edu.cn

Abstract: The pandemic has promoted the process of digital development in China, but it has also magnified the digital divide among the elderly, which has led to the inability of the elderly to integrate into social governance. In order to help the elderly address the problem of digital divide, based on previous scholars' research, this paper puts forward two psychological factors: (1) the elderly's resistance to emerging things and (2) the underestimation of the importance of smart devices can impose some remarkable impacts on the digital divide. Through empirical analysis, it is found that these two types of psychological factors have a negative correlation with the degree of the digital divide among the elderly. This study can provide theoretical support for the introduction of relevant policies to address the digital divide issue, thereby helping the elderly participate in the digital grass-roots governance more effectively.

1. Introduction

Under the epidemic situation, China has entered a period of rapid governance transformation, the rapid development of digital technology has broken through the limitations of traditional bureaucratic proceduralism and government-centrism, improved the communication efficiency of grass-roots organizations, and helped China move from the control mode of strong government and weak society to the new pattern of grass-roots autonomy of strong society and weak government (Xi 2015). However, the continuous advancement of digitization has accelerated the separation of the elderly from social governance. As an important medium for participating in grass-roots governance in the context of digitalization, intelligent devices have not been fully utilized by the elderly. Most elderly people are still unable to use smart devices well, or even do not have their own smart devices, which leads to a widespread digital divide among the elderly. It was not until November 24, 2020 that the State Council of China put forward the *Implementation Plan on Effectively Solving the Difficulties of the Elderly in Using Intelligent Technology,* and the issue of the digital divide among the elderly has gradually been paid attention to by all sectors of society.

In view of the above background, the relevant research in China has not kept up with the speed of evolvement of digitalization, and the domestic research of the digital divide of the elderly is still insufficient. Therefore, in order to help the elderly effectively integrate into the grass-roots governance, this paper makes an in-depth analysis of the generation mechanism of the digital divide of the elderly group on the basis of the previous scholars' research, summarizes the relevant conclusions and puts forward a new view that the psychological factors of the elderly will affect their degree of digital divide. The purpose of this paper is to help the elderly involve in the social governance in the digital environment, hence the purpose of this article is to explore how the psychological factors of the elderly affect their digital divide.

The remainder of this paper is composed of :(1) How digitalization has changed the grassroots governance pattern in China's urban areas (2) How the epidemic promotes the spread of digitalization (3) A brief literature review on the digital divide (4) Describe the specific process of

empirical analysis (5) Discuss conclusions and implications (6) Elaborate the limitations of this study.

2. The change of China's urban grass-roots governance pattern from the perspective of digitalization

In China, the administrative structure of the grass-roots in urban areas is generally a bureaucratic model of two-level government and three-level management (Yang 2011). However, the bureaucratic system has always been criticized by many scholars for its emphasis on the process of handling affairs, ambiguous rights and responsibilities leading to a long period of responding to the masses(Sun and Liang 2019). Community is the basic unit of the city and the last mile of governance. The top-down pressure constitution leads to that the community neighborhood committees and other grass-roots organizations can only act according to the rules. The dilemma of mismatch between power and resources leads to a serious lack of channels for people to participate in social governance. With the upgrading of digital technology, the development of e-government construction has weakened the government-centric administrative model. Under the circumstance of modernization of governance capacity, the government no longer starts from its own point of view, but from the experience and feedback demands of local citizens, thus forcing the government and its departments to reform. The development of digitalization has achieved remarkable results in helping the government to improve administrative efficiency, standardize the operation of power and reduce the cost of the system(Yu and Gao 2018). It not only overcomes the inherent drawbacks of the traditional bureaucracy, but also liberates the vitality of the grass-roots to a large extent.

With the support of digitalization, China's grassroots governance pattern has gradually transformed from the regulation mode of strong government and weak society to the autonomous mode of strong society and weak governance. Vertically, grass-roots people have obtained more convenient feedback channels through digitalization. The mechanism of feedback and anonymous evaluation system also makes the government more efficient in handling public affairs. Horizontally, the communication efficiency of grassroots has been dramatically improved, and it is more convenient for local residents to participate in the governance of grassroots affairs.

3. The epidemic situation promotes the digital popularization among the elderly

The spontaneous mobilization of the grass-roots masses in the environment of public crisis is a process of self-rescue from all walks of life, which has become the best opportunity to promote the popularization of digitization. Starting from Hangzhou, the health QR code created by local citizens launched the first digital anti epidemic campaign. After that, communities, streets and other social grass-roots units in cities across the country, jointly fight the epidemic by virtue of digital networks, a series of measures were resorted to ensure the health and safety of local residents, such as supervising the health daily attendance of the masses and registering we media accounts to publicize the important information of the epidemic. Secondly, the elderly are the main consumers of food and health care products. In view of the closed environment during the epidemic period, the elderly have to try online consumption (Wu et al. 2020). Overall, the large-scale digital participation of elderly groups provides a solid mass foundation for the transition to digital governance.

Digitization is still far from reaching the level of universal, according to the report of Internet life for the elderly in 2020, as of June 2020, there are about 96 million senior people active on China's mobile Internet, and there are about 250 million elderly people aged 60 and above in China. Therefore, there are still a large number of elderly people outside of digital governance. Several scholars have noticed that under the background of population aging, grass-roots governance needs to emphasize the main role of the elderly. However, the existence of digital divide contributes to increasingly difficult for the elderly to integrate into the social governance. According to the survey data of the status quo of the elderly social governance in Beijing in 2019, the results show that more than 67% of senior citizens are willing to participate in community governance activities, but in fact, the actual degree of participation in community governance is far less than 67%, which indicates

that there is a serious situation of high willingness, low participation among the elderly (Xie and Chen 2020). The existence of digital divide results in the convenience brought by digital technology cannot be reflected in the elderly. As a bridge to access the Internet, the poor understanding of intelligent devices among the elderly leads to them unable to mobilize themselves in social governance.

4. A brief literature review

The concept of the digital divide was first proposed in the 1990s. The digital revolution broke the traditional way of information transmission and storage, leading to the separation within the whole society (Joan Sidney Howland 1998). More specifically, technology divides those who can utilize information and communications technology (ICT) from those who cannot yet capitalize on information and communications technology (ICT). Later, this phenomenon was summarized as the first level digital divide, which describes the phenomenon that some people have difficulty accessing the Internet. However, only focusing on the access to the Internet cannot fully mirror the current situation of digital inequality. Give the reality of this situation, the scholar put forward the second level digital divide (Di Maggio and Hargittai 2001), which mainly includes the social environment, personal preferences, personal ability and other factors that lead to the differences in the use of information and communications technology (ICT) among different groups of people (Eszter Hargittai 2002). However, the former two digital divides only distinguish the difference in the use of information and communications technology (ICT), hence in order to describe how the digital divide affects the individual, the concept of the third level digital divide was proposed. This kind of digital divide is based on how this phenomenon influences individuals (Wei and Zhang 2011). Digital divide can lead to disparities in the way people acquire knowledge, which leads to a more serious Matthew effect in the whole society. Those who can effectively use information and communications technology (ICT) technology can study and socialize through the Internet, while those who are vulnerable due to the digital divide will be further deprived of resources such as economy, education and social network due to their inability to access or use Internet, thereby being in a more disadvantage position in society (N Kwak 2012).

The concrete manifestation of digital divide in the elderly group is the first and second level digital divide. As a vulnerable minority in society, the weak learning ability of the elderly leads to the knowledge poverty of the elderly group (Hu and Li 2001). This kind of poverty describes the rapid decline of the ability of the elderly to acquire, absorb and exchange new knowledge, which makes it difficult for the elderly to master the intelligent devices. Other scholars have shown that the personal health status of the elderly will noticeably affect the attitude of the elderly to use intelligent devices. According to the former research, the health also plays an indispensable role for elderly to spend time online, the worse the health of the elderly, the lower the probability of using smart devices to surf on the Internet (Zhang and Chen 2013). Moreover, some scholars have found that the digital literacy of the elderly can largely determine the severity of the digital divide suffered by the elderly (Xu et al. 2020). The influencing factors of digital literacy include the cultural feedback of the younger generation to the older generation, the mutual help of relatives and friends, and the education level, etc., all of which play a decisive role in the level of digital literacy of the elderly.

From the perspective of the smart device itself, the immature elderly-oriented measures of smart devices are also one of the main factors hindering the use of smart devices by the elderly, which limits the threshold of using smart devices (He and Zhang 2017). The immature elderly-oriented measures include many aspects, on the basis of software, the icons and words in the smart devices are too small to recognize, in terms of hardware, smart phones are not resistant to falling, which limit the use of the elderly, leading to greater difficulties in the operation of the elderly. All of these obstacles restrict the elderly from operating smart devices.

To sum up, the research of the previous scholars focuses on the objective factors of the elderly, such as learning ability, health status, digital literacy and the defects of the current intelligent device design, while the research on the subjective factors of the elderly is rarely mentioned. Therefore,

this paper puts forward a new view that psychological factors will affect the digital divide phenomenon among the elderly. The psychological factors include two aspects: (1) Traditional and conservative concepts of the elderly in China lead to their resistance to access new technological things; (2) The elderly ignore the importance of intelligent devices. Unlike the younger generation, who need WeChat and other software for work and daily communication, the elderly have a lower demand for smart devices. More importantly, the use of smart devices requires investment in money, time and other costs. In their eyes, the cost is far higher than the benefit, hence they are prone to underestimate the importance of smart devices.

5. Empirical analysis

5.1. Data sources

This article conducts a sample investigation of the elderly in different areas of Z City, Zhejiang Province through offline surveys and supplemented by online surveys. The survey mainly sampled the elderly in several areas of Z City. Restricted by the expenditure in the survey process, the sample size was set at 180. Finally, 133 valid questionnaires were obtained after some invalid questionnaires were deleted.

5.2. Model establishment

This study uses a multiple linear regression model to analyze the impact of psychological factors of the elderly on the digital divide. In this paper, the length of time spent online by the elderly through smart devices is used as the explained variable, and the psychological factors are used as the explanatory variable to explore the specific influence mechanism. Based on the above literature review, the remaining control variables can be divided into education level, gender, age, health status, consciousness and intelligence, the final model is as follows:

$$Y = \beta_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 X_7 + \mu \quad (1)$$

5.3. Research hypothesis

H_{01}: The elderly's resistance to emerging things is negatively correlated with the length of time they spend surfing the Internet through smart devices.

H_{02}: The elderly's underestimation of the importance of smart devices is negatively correlated with the length of time they spend surfing the Internet through smart devices.

5.4. Quantification of variables

Table 1 Quantification of variables

Variables	Quantitative methods of indicators
Education	Education years method
Physical health	Simple scale
Age	Survey data
Gender	Survey data
Intelligence	Simple scale
The elderly's resistance to new things	Binary variable
The importance of smart devices	Multi-Categorical variable
The degree of digital divide	The amount of time spent online [min/per day]

In this paper, the level of education of illiteracy, primary school, junior high school, senior high school and university are quantified as 0, 3, 6, 9, 12, respectively. The health status of the eyes, arm

joints and finger joints are investigated by the simple health scale. Intelligence is roughly estimated in terms of numeracy and memory. The attitudes of the elderly towards new things can be divided into two types: resistance and non-resistance, and their attitudes towards the importance of smart devices are divided into three categories: important, general, and unimportant. The impact of the digital divide is measured by the length of time spent online each day.

5.5. Descriptive Statistical Analysis

Table 2 Descriptive Statistical Analysis

Variable	Frequency	Mean	Max	Min
Gender				
Male	70			
Female	62			
Education		4.66	0	0
Illiteracy	13			
Primary school	54			
Junior high school	47			
Senior high school	16			
University	2			
Resistance to new things				
Yes	74			
No	58			
Importance				
Important	56			
General	28			
Unimportant	48			
Whether have smart devices				
Yes	76			
No	56			
Age		70.95	60	87
Intelligence		92.88	60	100
Physical health		91.36	60	100
Internet surfing time [min/per day]		49.36	0	300

The total number of samples involved in the regression is 132. The average age of the investigated elderly is 70.95 years old. The number of males and females is 70 and 62 respectively. Then, the highest and lowest scores of health and intelligence are both 100 and 60 respectively, and the average scores of health and intelligence are 91.36 and 92.88 respectively, which are both

slightly higher than 90. Therefore, the overall respondents are in a fairly healthy and intelligent state. In the aspect of psychological state, on the one hand, 74 elderly people have resistance to emerging things, while the remaining 58 elderly people have no resistance to emerging things. On the other hand, 28 elderly people think that smart devices are unnecessary for their daily lives, another 48 elderly people believe intelligent device for them completely didn't make any sense, the remaining 56 elderly people reckon intelligent device for them is very important, mainly because they can use such devices to watch news and maintain communication between neighbors and family members. In terms of the level of education, illiterate or semi-literate, primary school, junior high school, senior high school and university accounted for 13,54, 47, 16 and 2 persons respectively. The education level of the elderly surveyed is mainly concentrated in primary school and junior high school. In addition, we can also find that 76 elderly people have their own smart devices, while the remaining 56 elderly people do not have their own smart devices, the average time for the elderly to surf the Internet through smart devices is about 50 minutes per day, with the maximum even reaching 300 minutes per day.

5.6. Endogeneity correction

The linear regression model set above has an obvious disadvantage, which is mainly reflected in the problem of sample self-selection. In this paper, the Internet surfing time of the elderly is taken as the explained variable based on the premise that the investigated elderly people already have intelligent devices. In other words, the real Internet surfing time of those elderly people without intelligent devices cannot be observed in this study. For these elderly people, it may be because of their low economic level that they are unable to access the smart devices, however, there may be a minimum conservative Internet surfing time after acquiring the smart devices for them. Therefore, it is improper to simply change the surfing time of the elderly without smart devices to zero, which eventually leads to the decline of the predictive power of the model.

In this paper, Heckman's two-stage regression is selected for correction, thus this paper needs to find an exclusive constraint variable Z as the Instrumental Variable to modify the model. China's elderly has experienced a long history of not being rich. At present, although the income and consumption level of the elderly have improved compared with the past, under the influence of their parents, the consumption concept is still to pursue the practicality of goods. According to the research report, the income of the elderly accounts for the main share of food expenditure and health care expenditure, therefore, the elderly seldom pay attention to the expensive smart devices (Zhou et al.2015). Based on practical experience and above theory, at present, most of the ways for the elderly to obtain smart devices are mainly through gifts from others or elimination from their children, hence the Z variable of this paper selects the income of the children of the elderly. To sum up, this paper assumes that the income of children will have a direct impact on whether the elderly have smart devices, while the income of children cannot directly determine the length of the elderly online, the revised regression model is as follows:

$$Y = \sum_i^6 a_i X_i + \theta * Signal + \rho \sigma IMR + \phi (2)$$

Table 3 Statistics of children's income

Variable	Mean	Min	Max
Children's income	12530.3	3000	100000

Table 4 Regression result

Explanatory variable	Explained variable

Resistant and unimportant	-146.0*** (-5.94)
Resistant and general	-121.0*** (-5.35)
Resistant but important	-60.32 (-1.44)
Non-resistant but unimportant	-158.1*** (-5.59)
Non-resistant and general	-77.98*** (-3.66)
Health	0.163 (0.20)
Education	0.629 (0.19)
Age	-4.331** (-3.24)
Gender	24.77（1.46）
Inverse Mills ratio	-27.32 (-1.99)
Constant	271.9* (2.06)
N	132

* $P<0.05$, ** $P<0.01$, *** $P<0.001$

The above results (refer with: Table 4) manifest that the inverse mills ratio (IMR) this paper focuses on is not significant, which indicates that there are some problems in our endogenous hypothesis. According to my research experience, for most of the elderly, they have little interest in smart devices, which leads to that they do not have the so-called minimum conservative use time. Therefore, according to the above regression results (refer with: Table 4), this study can omit the inverse mills ratio and regard the surfing time of the elderly without smart devices as 0.

Table 5 Regression results without inverse mills ratio

Explanatory variable	Explained variable
Resistant and unimportant	-99.62*** (-7.37)
Resistant and general	-95.90*** (-7.35)
Resistant but important	-59.78* (-2.04)
Non-resistant but unimportant	-87.53*** (-6.28)
Non-resistant and general	-72.08*** (-3.75)
Gender	13.40(1.34)
Age	-2.339** (-3.02)
Health	0.189 (0.57)
Intelligence	0.619*(2.32)

Education	0.643(0.35)
Constant	190.5** (2.88)
N	132

* P<0.05, ** P<0.01, *** P<0.001

The regression results (refer with: Table 5) show that the psychological factors of the elderly have a significant impact on the Internet surfing time. On the whole, the Internet surfing time of the elderly with resistance emotion is about 32 minutes less than that of the elderly without resistance emotion. Secondly, in the group of the elderly who are resistant to emerging things, the Internet surfing time of the elderly who think that smart devices are not important is about 40 minutes lower than that of the elderly who think that smart devices are important, while in the group of the elderly who are not resistant to the emerging things, the Internet surfing time of the elderly who think that smart devices are not important is about 87 minutes lower than that of the elderly who think that smart devices are important. Finally, the results also show that age and the length of Internet surfing time also have a noticeable impact, in which the length of surfing time of the elderly decreases about 2 minutes with the increase of per year, while intelligence and the length of surfing time show a significant positive correlation.

5.7. The test of multicollinearity

Multicollinearity problem can lead to our model coefficient appears distorted, such as the strong correlation between two variables this paper couldn't tell exactly which explain variables in influencing is explained variable, which leads to coefficient of this model to lose meaning. Therefore, it is necessary to test multicollinearity in this paper, test results are shown in table below:

Table 6 Variance Inflation Factor (VIF) test results

Explanatory variable	VIF (Variance Inflation Factor)
Resistant and unimportant	1.89
Resistant and general	1.46
Education	1.46
Intelligence	1.31
Health	1.3
Resistant but important	1.25
Age	1.22
Non-resistant and general	1.19
Non-resistant but unimportant	1.09
Gender	1.05
Mean VIF	1.32

The results (refer with: Table 6) of VIF test show that the average value of variance inflation factor is 1.32, which is far less than 5, and each value of variance inflation factor is not more than 2.

Therefore, it can be considered that there is almost no multicollinearity problem in the model set in this paper, which means that the coefficients before the explanatory variables can clearly reflect their respective effects.

5.8. Robustness test

Because the number of samples in this paper is not large, it is necessary to test the robustness. This paper decided to replace explanatory variables to perform robustness tests, divide the importance of indicators into important and unimportant categories, and then carry out regression to test the robustness of the model.

Table 7 Robustness test results

Explanatory variable	Explained variable
Resistant and unimportant	-98.73*** (-7.65)
Resistant and important	-59.91* (-2.07)
Do not resist but unimportant	-78.91*** (-5.19)
Gender	13.50 (1.37)
Education	0.617(0.35)
Age	-2.364** (-3.09)
Intelligence	0.608* (2.32)
Health	0.162(0.50)
Constant	196.0**(3.04)
N	132

* $P<0.05$, ** $P<0.01$, *** $P<0.001$

The table (refer with: Table 7) above shows that our core explanatory variables are still significant after adjustment, and other parameters have no evident changes on the whole, which can be considered that the model in this paper is robust.

6. Conclusions and implications

The result of the previous empirical analysis clearly reveals that psychological factors have a striking impact on the Internet surfing time of the elderly. Targeted help for the elderly to overcome psychological barriers can dramatically enhance their willingness to use intelligent devices, thereby solving the digital divide problem among the elderly and spurring the elderly to participate in social governance.

First of all, this paper finds that, on the whole, the Internet surfing time of the elderly who are resistant to new things is lower than that of the elderly who are not. In order to change their stereotype of smart devices, the introduction of relevant policies needs to start from overcoming the elderly's fear of new things, such as informing the elderly that there are a kind of smart devices with simple operation and clear functions.

Secondly, arousing the elderly's awareness of the importance to use the intelligence devices can effectively increase the Internet surfing time of the elderly. Therefore, the government and the

community need to be aware of the necessity of publicizing and popularizing the use of smart devices. Intelligent devices play an irreplaceable role in contemporary social governance.On the one hand, the importance of smart devices in fighting against public crises is obvious, taking this public health crisis as an example, daily routines such as displaying digital health QR codes and online shopping need to rely on smart devices as intermediary. At present, it is still difficult for human beings to predict the next crisis, hence intelligent equipment as a new equipment of social governance is an important means to reduce losses and even casualties. On the other hand, the elderly group can timely feedback problems to local departments or relevant organizations through smart devices, moreover，the elderly can also actively put forward some suggestions on community and other grass-roots affairs by virtue of smart devices. By publicizing the implication of smart devices can help the elderly gradually abandon the backward view that "no smart devices have no impact on their own life".

In conclusion, the effects of different policies for the elderly are quite different. This paper provides a theoretical support for the elderly to participate more effectively in grassroots governance.

7. Limitations of the study

There are two limitations in this paper. On the one hand, the research of this paper is a micro level research, and the scope of the research is only limited to one region, ignoring the influence of some macro factors. For instance, the condition of economic development in China varies from region to region, which will directly affect the difference in living standard of people in these different regions, eventually leads to differences in the length of time the elderly spends online. The policy orientation of the local government is also an important macro element. For example, some policies issued by different regions will directly or indirectly influence the use of smart devices by the elderly. Direct policies, such as some regions that are extremely concerned about the quality of life of the elderly and aware of the negative effects of the digital divide, hence frequently formulate policies to help local elderly people address the digital divide problem. Indirect policies, for instance, some areas strongly encourage and promote the development of emerging industries including Internet industry, this can cause a series of positive external impact to their local society, which can subtly influence the local citizens and government, etc. On the other hand, in order to prevent the elderly from showing impatience, the intelligence measurement scale and health scale designed in this paper are relatively simple, which leads to the inaccuracy of some data collection.

References

[1] Xian Yinsong. Research on the "Three Modernizations" Service Management Innovation in Huangpu District from the Perspective of Grassroots Governance, South China University of Technology, 2015.

[2] YANG, Hong-shan. The Challenges of Urbanization and Governance Transition in Urban China. International Conference on Public Management, 2011.

[3] Sun Youluo, Liang Houhao. Defects and Improvement of Feedback Mechanism of Public Participation -- From the Perspective of Local Administrative Legislation. Journal of Guangxi Normal University for Nationalities, vol.36, no.6, pp.58-62, 2011.

[4] Yu Jianxing, Gao Xiang. The basic experience and future of Zhejiang Province's "run at most once" reform. Zhejiang Social Sciences, no.4, pp.76-85+158, 2018.

[5] Wu Jing, Zhang Feng, Sun Yi, Zhu Yongbin, & Liu Changxin. (2020). Challenges and opportunities in promoting digital transformation in China. Bulletin of Chinese Academy of Sciences, vol.35, no.3, pp.306-311, 2020.

[6] Xie Lili, Chen Minqiang. (2020). Influencing factors of urban elderly participation in community governance from the perspective of individual-environment matching: Based on a

survey in Beijing. Population Research, no.3, pp.71-84, 2020.

[7] Howland, S. , Joan. The 'digital divide': are we becoming a world of technological 'haves' and 'have-nots?'. Electronic Library, vol.16, no.5, pp.287-289, 1998.

[8] Dimaggio, P. , Hargittai, E. From the 'digital divide' to 'digital inequality': studying internet use as penetration increases. Working Papers, 2001.

[9] Eszter Hargittai. Second-Level Digital Divide: Differences in People's Online Skills. First Monday, vol.7, no.4, 2002.

[10] Wei Lu, Zhang Mingxin. The Third Digital Divide: Knowledge Gap on the Internet. Journalism & Communication, no.4, pp.43-53, 2006.

[11] kwak, N. Digital divide: civic engagement, information poverty, and the internet worldwide. Info, vol.79, no.1, pp.915-918, 2012.

[12] Hu Angang, Li Chunbo. New poverty in the new century: knowledge poverty. Social Sciences in China, no.3, pp.70-81+206, 2001.

[13] Zhang Shuo, Chen Gong. Research on Influencing Factors of New Media Use among the Urban Elderly in China -- Based on a Survey in Chaoyang District, Beijing. South China Population, vol.28, no.4, pp.64-72, 2013.

[14] Xu Yue, Yun Zhuomin, Wang Jingyuan, Jing Rongjie, Huang Liming, Shen Qin. In the context of intelligence, the influencing factors of the digital divide in the elderly and the analysis of its formation process. Intelligent computers and Application, vol.10, no.2, pp.75-82, 2020.

[15] He Quan, Zhang Xiangdi. Influencing factors and social integration strategies of the digital divide among the elderly. Journal of Zhejiang University of Technology (Social Science Edition), no.4, pp.437-441, 2017.

[16] Zhou Qingqing, Chen Jianan, Ma Chenyun, Lin Chen. Research report on the consumption behavior and demand of the elderly in Hangzhou. Morden Property Management, vol.14, no.4, pp.4-9, 2015.