

Research on the Impact of Social Capital on the Utilization of Elderly Community Pension Services from the Perspective of Active Aging

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Abstract: under the background of the continuous deepening of China's population aging and the implementation of the active aging strategy, the community, as the core carrier of pension service supply and elderly social participation, its security function and supporting role are increasingly prominent, and improving the community pension service system has become the key support to achieve the core goals of elderly health, participation and security. Based on the data of the 2,020 China Elderly Social tracking survey (CLASS), supported by the theory of social capital, this study divides social capital into three dimensions: social network, reciprocal norms and social trust, and uses the 2 yuan Logit model to empirically test the impact of social capital on the use of elderly community care services. It is found that social capital has a significant positive effect on the utilization of elderly community pension services, and the driving effect of trust capital is the strongest. From the perspective of social capital, this study expanded the research on the influencing factors of the elderly community pension service utilization, and provided empirical basis and policy reference for the accurate cultivation of community social capital, optimization of service supply structure, and promotion of positive aging.

Keywords: Active Aging; Social Capital; Utilization of Community Elderly Care Services

1. Introduction

With the prosperity and development of China's social economy, the aging of the population has become an irreversible long-term trend in the process of China's economic and social development. According to the data of the seventh national census, the proportion of people aged 60 and above in China has reached 18.70%[1]. It is estimated that it will break

through 30%[2]. And enter the stage of severe aging. With the miniaturization of family structure and the continuous deepening of empty nest and the weakening of traditional family pension function, the supporting role of the community based pension service system in protecting the basic life of the elderly and improving the quality of life in old age is increasingly prominent [3]. China's "15th Five-Year Year Plan" program clearly requires to deeply implement the national strategy of actively responding to the aging population, develop community embedded pension services, and promote the elderly to have a sense of security, a sense of security and happiness [4]. However, at present, there are still some problems in China's community pension service, such as the imbalance of supply structure, the low awareness rate of services, and the insufficient willingness of the elderly to actively use. In some areas, there is a contradiction between idle facilities and demand gap[5]. How to understand and improve the utilization level of elderly community pension services has become a practical issue that needs to be responded to in active aging policy practice and public management research.

As a strategic direction of national development, active aging emphasizes that the elderly should be supported by the three pillars of "health", "participation" and "security", and the elderly should be regarded as precious social resources rather than a burden. In this perspective, improving the social participation ability of the elderly and building a friendly community environment are regarded as the core path to achieve the well-being of the elderly and the sustainable development of the national pension system. As trust, norms and relationship resources embedded in the community network, social capital can have a profound impact on individual public service participation behavior through mechanisms such as information transmission, mutual support and risk reduction.

It can provide an important theoretical perspective for understanding the elderly community pension service utilization behavior. Previous studies have shown that social capital has a significant positive impact on health behavior and public service utilization, but in the field of community pension services, especially for the elderly in China, the system empirical test is still relatively limited. Based on this, from the perspective of positive aging, this study focuses on the impact mechanism of social capital on the utilization of elderly community pension services, aiming to provide empirical basis for optimizing the supply of community pension services and activating the elderly social resources.

This study uses the 2,020 China Elderly Social tracking survey (CLASS) data, which was organized and implemented by Renmin University of China, covering the elderly groups aged 60 and above in 28 provinces across the country, including social networks, community participation, trust, service utilization and other multidimensional information, and the sample is representative of the country. The dependent variable is "community pension service utilization", and it is operated as two classification variables. The core independent variable is the comprehensive index of social capital. According to the three-dimensional framework of social capital theory -- social network, reciprocal norms and social trust building, the comprehensive index is obtained by equal weight after standardization of various dimensions. The 2 yuan Logit model was used to carry out the benchmark regression, and the sub dimension regression and multiple colinearity test were further carried out to ensure the results were stable.

On the whole, this study aims to provide support and feasible countermeasures for the development of differentiated and precise pension services from the perspective of social capital cultivation, promote the elderly to better integrate into the community and actively use pension services, and provide theoretical reference and practical path for the realization of positive aging and the construction of an aging friendly society.

2. Literature Review and Research Hypotheses

2.1 Social Capital

The first academic system to describe the concept of social capital is by French scholar Bourdieu. He defined social capital as the total of actual or potential resources embedded in the social network. It is an integral part of social structure, and its value can be realized through the exchange of trust and resources in the network [6]. Different from Bourdieu's structuralism orientation, from the functional perspective, American scholar Coleman believes that social capital is a social structural element that can promote the occurrence of actions and the realization of behavior goals [7]. Based on The previous two scholars' discussion, the scholar Putnam R D, thinks that social capital has the attributes of trust, norms and network[8]. The mutual connection between individuals in the society is also manifested in social networks, reciprocal norms and universal trust [9]. In the later research, researchers basically affirmed that social relations network is the basic component of social capital, and then concerned about the differences of social capital in different structure of relations network or according to their own interests, carried out in-depth research on reciprocity norms, social trust and other aspects. In his research, Granoveter proposed four key indicators to determine the strength of network relations in Social capital [10]. One is the frequency of interaction, that is, the time and energy that individuals put into maintaining this relationship. The more intensive the interaction, the more stable the interpersonal connection; Two is the emotional intensity, the deeper the emotional connection, the higher the value of social capital can play; Three is the level of trust, the higher the level of trust, the stronger the stability of the social capital system; Four is the degree of reciprocity. The higher the coverage and frequency of resource exchanges between different relationships, the closer the relationship will be [11].

On the basis of Western studies, domestic scholars mainly discussed the differentiation of social capital from three perspectives: macro, meso and micro. Different levels of social capital have different focuses on functions and measurement methods. The social capital at the macro level mainly involves political aspects such as citizen participation and institutional efficiency [12], Xiong Meijuan believes that the breadth and frequency of social networks, the trust between citizens and the reciprocal norms generated in citizen participation together

constitute social capital [13]. At the mesolevel, at the mesolevel level, social capital involves mainly social units such as communities and villages, social capital involves mainly social units such as communities and villages. Some scholars believe that social capital can play a positive role in community governance and play a positive role in promoting the prosperity and development of social organizations [14], for example, Zhan Jing and Zhao Yue Zhan Jing and Zhao Yue from the community perspective, for example, Zhan Jing and Zhao Yue from the community perspective, think social capital is a good interaction between community residents, residents and community neighborhood committees and residents and residents and community residents and residents and social organizations [15]. Social Capital in the micro level mainly refers to the resources[16], which can play an important role in building social ties and information flow and sharing. Scholars generally believe that social capital not only affects the social status of individuals, but also enhances their ability and willingness to participate in public affairs to a certain extent [17].

Demonstrated Benefits from Social Capital: The Productivity of Farmer Organizations in galoya[18]. The formation of structural social capital mainly relies on the internal rule system, interpersonal network and multiple interaction mode of social organizations, and various social organizations are the core carriers of its formation and development; And cognitive social capital is rooted in civil culture, which is composed of normative consensus, values, attitudes and spiritual beliefs. In the study, Zhou Guangsu and other scholars chose "gift money exchange" as the proxy variable of cognitive social capital [19]. Bian Shu and Ji Xiaochen [20] is focused on the trust level, and the selection of "social frequency degree of social networking" is selected as the key characterization of structured social capital as the key characterization of structured social capital. Guiyong and Huang Ronggui proposed seven dimension measurement methods for community belonging sense of community belonging, reciprocity and community trust including seven dimensions such as community reciprocity, reciprocity and community trust [21], Xie Zhiju and Tan Hongbo proposed six measurement methods from social participation and community cooperation from social

participation and community cooperation from six aspects of social participation and community cooperation from social participation and community dimension of social capital measurement [22].

In summary, even though different scholars have different understanding of social capital and different emphasis, most scholars have described the existing forms and functions of social capital from the aspects of trust, network and reciprocal participation. Therefore, based on patnam's theoretical framework, combined with existing research and relevant data, this paper takes social network, social trust and reciprocity norms as the three basic elements of social capital to carry out the research. Among them, social networks can reflect the communication between individuals and other community residents and the closeness of the relationship, with multiple functions such as information acquisition, mutual assistance and risk sharing. Putnam pointed out that the close relationship network can effectively enhance the initiative of residents to participate in community public activities [23]. Social trust is a kind of social psychological phenomenon produced in people's communication relations. It is a cooperative bond formed in the pursuit of common goals between communities or groups, which has a strong appeal. Reciprocity norm is a way of getting along with each other in social communication, which is a default exchange behavior. Putnam believes that universal reciprocity is a kind of continuous transaction relationship. Even if there is no return in a certain period, it gives people an expectation that they will be given to others now and will be given by others in the future [24]. Scholars often think that in the case of the failure of formal norms, the informal norms with the reciprocity norms as the core are the final support to connect the community residents and maintain the community life order [25].

2.2 Community Elderly Care Services and the Utilization of Elderly Community Elderly Care Services

Looking back at the literature, early studies often limited the pension function to the intergenerational exchange within the family. However, with the miniaturization of family structure and the deepening of empty nest and the weakening of traditional family pension function, the academic community has gradually

realized the key role of the formal and informal support network at the community level in filling the gap of family care function.

After World War II, the British "anti institutionalization movement" promoted the rise of community care model [26] population and society, Adam Pavey and Dame Ptsios proposed the definition of community care based on the research of the United States based on the United States[27].Adam Pavey and Dame Ptsios proposed the definition of community care based on the research of the United States based on the United States, based on the informal care between relatives and friends or neighbors In China, the research on community pension service began in the early 1,980s. In 2000, the Central Committee of the Communist Party of China and the State Council formulated the decision on strengthening the work of the elderly, which proposed for the first time to establish an old-age mechanism including family, community and society, and to "establish an old-age mechanism based on family pension, relying on community services and supplemented by social pension.". In terms of concept, the scholar Liang Xinyue believes that the community pension service is based on the family and community, using the existing resources of the community to provide physical and mental care and rights and interests protection for the elderly[28]. Wei Yuhong believes that the community elderly care service is the government and social forces relying on the community to provide life care, spiritual consolation, medical care, rehabilitation care and other services for the elderly at home [29].

In terms of demand and utilization, the academic community generally believes that the demand of the elderly for community home-based care services is characterized by diversification, and domestic and foreign scholars have conducted extensive discussions on the content of demand. In foreign relevant studies, the demand for community sweet services is generally summarized as "3M", that is, economic demand, medical demand and psychological demand [30].Most domestic scholars believe that the needs of community pension services can be divided into life care, medical care, spiritual consolation and other major aspects [31]. For the influencing factors of the demand for community-based home-based care services, existing studies believe that, in terms of age, with the growth of age, the demand of the

elderly in medical care and daily care is becoming higher and higher [32].In terms of gender, Meyer believes that women live longer than men, and women are more likely to live alone when they are old, so women will need more community services than men [33]. In terms of health status, Zhao Miao et al. Found that the poorer the physical condition and the more the number of chronic diseases are, the higher the demand for community pension services is [34]. At the same time, the education level and economic status of the elderly also have a significant impact on their demand for community pension services [35], the income level of the elderly is positively related to the demand for community pension services [36]. Taking Anxin County as the research scope, Qi Chengxi and Zhang Baozhen found that the further away from the countryside, the higher the demand of the elderly for community pension services[37]. The Empirical Study on the elderly in Beijing new town revealed that after controlling multiple variables, demographic characteristics, health status, social support and community care services by older persons were important factors affecting the cognition and utilization of community services [38].

In terms of service content, the characteristics of foreign community elderly care services are to respect the individual needs of the elderly, and the service content is smooth and shows a high degree of flexibility. The Care of the UK focuses on providing material support, life care, psychological support and overall care [39]. Germany provides more detailed pension services such as clothing, food, housing, transportation, entertainment, reading and rehabilitation[40]. The content of domestic community pension services usually includes three aspects: daily care, spiritual consolation and medical care services. For example, the scholar Wu Di proposed that the community can provide the elderly groups with various services such as day care, rehabilitation care, household cleaning, psychological consolation, etc. to help the elderly realize the pension mode of combining family and community, so that the elderly can continue to live in the familiar home and community environment [41]. With the development of digital technology, more and more scholars put forward the digital construction of community pension service. Sui dangchen and Peng Qingchao studied the application of digital technology such as block

chain and artificial intelligence in community pension services [42]; Zhu Wenpei and Karakorum Yi studied and put forward the community medical and nursing service network [43]; Wang Chen paid attention to the spiritual and cultural needs of the elderly, and proposed to optimize the cultural pension service of the community through the digital management system [44]. In addition to the improvement of basic functions, the development of AI provides a new enabling path for the accurate development of community pension. Zhu Hao proposed that the aging design of the community should be carried out based on the three dimensions of demand, process and ethics, and give full play to the precision service efficiency of AI for community pension services [45].

2.3 Literature Review

Community is the core carrier of elderly social participation. In recent years, the utilization of elderly community care services has gradually become the core topic of elderly sociology and health services research. Under the support of classic social capital theories such as Bourdieu, Coleman and Putnam, the academic community has increasingly attached importance to the role of structural social capital and cognitive social capital in the use of elderly care service scenarios. Li Shan and Wu Licai believe that the cultivation of community social capital can promote mutual trust, mutual benefit and active participation in the community network, promote the development of community collective action and the realization of the community's established goals. Social capital cultivation and utilization in the process of community construction [46]. Scholars generally believe that the analysis of social capital is helpful to explore the possibility of community pension. Social capital can not only promote the multi-party cooperation among community members, community organizations, community members and organizations [47], it can also help the elderly to increase social resources [48]. Wang Wenbin believes that the trust and cooperation spirit formed by social capital can further enhance the sense of belonging and identity of community residents by promoting the communication and exchange of community residents [49].

Although the existing research has explored the relationship between social capital and pension services, there are still some limitations and gaps

in the existing research. First of all, the analysis perspective of the existing research is relatively limited. Most of the research focuses on the traditional micro and macro level of individual health, economic level, service supply quality and so on to explore the utilization of elderly community pension services, but ignores the subjective initiative and social embeddedness of the elderly, and lacks the deep logic of systematically interpreting the elderly community pension service utilization behavior from the perspective of social capital. Secondly, the existing researches on social capital are more general, most of them take social capital as an overall variable to carry out analysis, and lack of in-depth and detailed discussion on the specific action path and influence differences of social network, reciprocal norms and social trust dimensions, and the analysis of internal mechanism is not comprehensive. Finally, most of the studies have strong universality, lack of heterogeneous research on the elderly groups of different ages, household registration and gender, and fail to accurately capture the differences in service utilization characteristics of different elderly groups. It is difficult to adapt to the current development needs of accurate pension and active aging, and cannot provide sufficient empirical support for the fine and differential optimization construction of community pension services.

Based on the above theoretical logic and realistic background, this study puts forward the core hypothesis: social capital and its dimensions have a significant positive impact on the use of elderly community pension services.

3. Research and Design

3.1 Data Sources

This study uses the data of 2,020 China Elderly Social tracking survey (CLASS). The data was organized and implemented by Renmin University of China, which is a national representative tracking survey project. Since the baseline survey was carried out in 2014, CLASS has conducted a nationwide tracking survey every two years, and systematically collected multi-dimensional information on the health status, social participation, economic conditions, family relations and community environment of the elderly, providing a solid empirical basis for the study of aging issues in China. In 2020, the CLASS survey covered 11,398 elderly samples

across the country. This study focuses on the utilization of community elderly care services and its influencing factors. Because there is no lack of main variables, this study uses 11,398 full samples for analysis.

3.2 Variable Selection

3.2.1 Explained Variable: Utilization of Community Pension Service

The utilization of community old-age services refers to the actual use of old-age services provided by the community by the elderly in a certain period of time. According to the characteristics of CLASS2,020 questionnaire and existing research practices, this paper measures the service utilization behavior of the elderly by "whether at least one community pension service has been used". Because about 89% of the elderly in this sample do not use any community pension services, there is a significant zero inflation problem in the number of service types. Therefore, this study uses two categories of variables to measure service utilization behavior to ensure the effectiveness of model estimation. The D9 part of the questionnaire lists nine common community pension services, including on-site visits, elderly service hotline, accompanying medical care, helping with daily shopping, legal aid, on-site housework, dinner table or meal delivery for the elderly, day care station or nursing home, and psychological counseling. If the interviewee answers "used" to any one of them, it will be regarded as a service utilization behavior and the assigned value is 1, otherwise the assigned value is 0.

3.2.2 Core Explanatory Variable: Social Capital

Social capital refers to the total resources of individuals embedded in social networks, including three dimensions of social networks, social trust and social norms. Based on the theory of social capital, this study constructs a three-dimensional social capital composite index using CLASS2,020 questionnaire. The specific construction method is as follows:

Social network: the measurement of social network is based on the six items in part D12 of the questionnaire. The items cover the social connection characteristics of the elderly and two types of objects, including the number of people who meet or contact each month, the number of people who can confide in their private affairs, and the number of people who can provide practical help. Each item was assigned a score of

0-5 from "None" to "9 and above" according to the number of people. After adding up the scores of the six items, it was converted to the [0, 1] interval by the minimum maximum standardization method, so as to get the comprehensive index of social network capital. The higher the value, the richer the social network resources of the elderly.

Reciprocity norms: the measurement of community reciprocity norms uses 8 items in part D15 of the questionnaire, covering the frequency of elderly people's participation in community security patrols, neighborhood mutual assistance, environmental health maintenance, conflict mediation, voluntary services and other community activities in the past year. Each item was assigned a score of 0-4 from "not participating" to "almost every day" according to the participation frequency. After adding up the scores of the 8 items, the value was also converted to the [0, 1] interval through the minimum maximum standardized method. The higher the value, the higher the level of mutual norms recognition of the elderly.

Social trust: social trust capital is built on the basis of 8 items in the B24 part of the questionnaire, and is measured by the elderly's satisfaction evaluation on the community road conditions, public facilities, public security environment, respect for the elderly atmosphere, and residents'committee work. The original option uses a positive score (1 = very satisfied, 5 = very unsatisfied), so first reverse the evaluation of the score of the items, and then add up the scores of the 8 items and standardize them to the [0, 1] interval. The higher the value is, the higher the trust level of the elderly in the community.

In order to get the comprehensive index of social capital, the standardized scores of the three dimensions of social network capital, reciprocal regulatory capital and social trust capital are averaged equally, and the final value range is 0-1. The larger the value is, the higher the social capital level of the elderly is. The index not only retains the information of each dimension, but also is easy to explain and compare the regression coefficient.

3.2.3 Control Variables

In order to alleviate the missing variable bias, this study integrated the existing literature research findings, and selected the control variables from the individual demographic characteristics, health status, economic status

and community environment dimensions. The specific settings are as follows:

(1) Demographic characteristics: including gender (male = 1, female = 0); Age; Education level (1 = illiterate, 7 = undergraduate and above); Marital status (with spouse = 1, no spouse = 0); The nature of household registration (Urban = 1, rural = 0).

(2) Health status: including self-rated health status (1 = very healthy, 5 = very unhealthy); The number of IADL obstacles (based on 6 items of B6, count the number of items that need other people's help or can't be completed independently, the range is 0-6); The number of chronic diseases (based on the 23 items of B9, count the number of chronic diseases confirmed by doctors, and the value range is 0-23).

(3) Economic situation: the D1 item of self-rated economic level in the questionnaire (1 = better than others, 2 = almost, 3 = worse than others) was used to measure.

(4) Community environment: including the number of types of community service supply (based on the item D9, count the number of pension service projects provided by the community, and the value range is 0-9); The type of residential area (taking the rural area as the reference group, setting the city as the virtual variable).

3.3 Model Setting

In order to test the impact of social capital on the utilization of elderly community pension services, the following empirical model is built in this study.

3.3.1 benchmark Regression Model

Because the explained variable "community pension service utilization" is a two category variable (1 = used at least one service, 0 = not used), so this study uses 2 yuan Logit model to estimate. The benchmark regression model is set as follows:

$$\log\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_1 \cdot \text{SocialCapital}_i + \sum_{k=1}^K \gamma_k X_{ki} + \varepsilon_i$$

Among them, P_i represents the probability of the i elderly using community pension services; SocialCapital_i is the core explanatory variable -- social capital composite index; X_{ki} is the K control variable, including gender, age, education level, marital status, urban household registration, self-rated health, number of IADL barriers, number of chronic diseases, self-rated

economy, type of community service supply and type of residential area (city, town, rural area as the reference group); ε_i is the random error term.

In order to show the net effect of social capital, this research model 1 is only included in the comprehensive index of social capital; In model 2, all control variables were added.

2. Sub Dimension Regression Model

In order to investigate the independent effect of social capital dimensions, the social capital composite index was replaced by three sub dimensions, and regression was carried out respectively.

$$\log\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_1 \cdot \text{Network}_i + \sum_{k=1}^K \gamma_k X_{ki} + \varepsilon_i$$

$$\log\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_1 \cdot \text{Participation}_i + \sum_{k=1}^K \gamma_k X_{ki} + \varepsilon_i$$

$$\log\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_1 \cdot \text{Trust}_i + \sum_{k=1}^K \gamma_k X_{ki} + \varepsilon_i$$

Among them, Network_i , Participation_i , Trust_i respectively refer to social network capital, reciprocal interaction capital and social trust capital. The control variables were consistent with the benchmark regression model 2.

4. Empirical Results and Analysis

4.1 Descriptive Statistical Analysis

About 10.9% of the elderly in the sample have used at least one community pension service, reflecting that the overall utilization rate of the current community pension service is still at a low level, and most of the elderly have not yet formed a stable community service use behavior. The average value of the standardized social capital composite index is 0.371, indicating that the social capital level of the sample elderly is low on the whole, and the difference between individuals is small, and the distribution is relatively concentrated.

In terms of control variables, the sample structure shows the following characteristics: the gender proportion is balanced, and the male proportion is about 50.4%; The average age of the interviewees was 72.03 years old, with a large age span, covering groups in different stages of old age; The average education level is 2.98, which is at the level of primary school to junior high school, reflecting the low education level of the group as a whole; In terms of marital status, about 75.4% of the elderly have spouses, indicating that most of the elderly are still in a

marital state and the family support base is relatively stable; The proportion of urban household registration was 42.3%, and the distribution of urban and rural areas was relatively balanced. In terms of health status, the average self-rated health was 2.64, which was in the middle level; The average number of IADL disorders was 0.49, indicating that most of the elderly had good activities of daily life, but there were still some elderly people with instrumental daily life disorders; The average number of chronic diseases is 1.72, which shows that the prevalence of chronic diseases in the sample elderly is high, and there is a certain risk of health status. In terms of economic and community characteristics, the average self-rated economic status was 1.93, which was in the middle level; The average value of the types of community service supply is 11.12, and the standard deviation is 11.27, which indicates that the supply level of pension services in different communities is quite different, and the distribution is obviously unbalanced. In general, the distribution characteristics of the variables are basically consistent with the theoretical expectation and the existing research conclusions, which lays a reliable data foundation for the subsequent regression analysis.

4.2 Benchmark Regression Results

In order to ensure the validity of the model estimation, this study tests the multicollinearity between explanatory variables. The results showed that the variance expansion factor (VIF) of all variables was less than 2, with an average value of 1.25, far below the critical value of 5 recognized by the academic community. At the same time, the Tolerance of each variable was greater than 0.5. Generally speaking, there is no multicollinearity problem in the model, and the coefficient estimation of the regression results is stable and reliable.

Table 1. Multicollinearity Test Results

Variable Name	VIF	Tolerance
Comprehensive Social Capital Index	1.05	0.949
Gender	1.07	0.934
Age	1.30	0.770
Educational Attainment	1.36	0.733
Marital Status	1.14	0.875
Household Registration Type	1.77	0.566
Self-rated Health Status	1.20	0.832
Number of IADL Limitations	1.27	0.785
Number of Chronic Diseases	1.16	0.861

Self-rated Economic Status	1.01	0.994
Types of Community Services Available	1.04	0.962
Region (Urban)	1.65	0.605
Mean VIF	1.25	-

Table 1 reports the benchmark regression results of gradually adding control variables, of which model (1) is a single variable regression that only includes core explanatory variables, model (2) is a complete model that includes all control variables, and the bracket is a robust standard error.

First of all, the effect of core explanatory variables in the model is always stable. In the model without control variables (1), the regression coefficient of the social capital composite index is 2.968, and it is significantly positive at the statistical level of 1%; In the model (2) that included all the control variables, the positive effect was still significant, and the coefficient increased to 3.569. The results show that the higher the level of social capital of the elderly, the higher the probability of using community pension services. The effect is still stable after controlling individual characteristics, health status, economic level and community environment. It verifies the positive role of social capital in the use of community pension services for the elderly.

Secondly, the influence of the control variables is basically consistent with the theoretical expectation. In terms of individual characteristics, the regression coefficient of age is significantly positive, indicating that with the increase of age, the probability of the elderly to use community pension services has increased; The service utilization probability of the elderly with urban household registration is significantly higher than that of the elderly with rural household registration, which reflects the difference between the supply and accessibility of community pension service resources in urban and rural areas. In terms of health status, the coefficients of self-rated health status, the number of IADL disorders and the number of chronic diseases were significantly positive, indicating that the older people with poor health status and more functional disorders are more dependent on community pension services, and are more inclined to use community services to make up for their lack of ability. In the aspect of economy and community environment, the elderly with better self-evaluation economic status have higher probability of using

community pension services; The coefficient of the types of community service supply is significantly negative, which may reflect that there is a mismatch between the current supply of some community pension services and the actual demand of the elderly, and the increase in the number of supply has not been effectively translated into the improvement of service utilization rate. In addition, the service utilization probability of the elderly in urban areas is significantly lower than that in rural areas, which may be related to the diversification of the elderly service market in urban areas and

the lack of attraction of community services. When the urban elderly are faced with more choices of pension services, the substitution of community pension services will be enhanced; However, the elderly in non urban areas have limited service choices and higher dependence on community services, so the utilization rate is higher.

Overall, the benchmark regression results verify the significant positive impact of social capital on the utilization of elderly community pension services, and this effect is still stable in the process of adding control variables.

Table 2. Baseline Regression Results (N=11398)

Variable Name	(1) Without Control Variables	(2) With Control Variables
Comprehensive Social Capital Index	2.968*** (0.266)	3.569*** (0.296)
Gender	-	0.017 (0.064)
Age	-	0.013** (0.005)
Educational Attainment	-	0.027 (0.027)
Marital Status	-	-0.129* (0.076)
Household Registration Type	-	0.301*** (0.090)
Self-rated Health Status	-	0.079** (0.039)
Number of IADL Limitations	-	0.084*** (0.024)
Number of Chronic Diseases	-	0.218*** (0.019)
Self-rated Economic Status	-	0.180*** (0.055)
Types of Community Services Available	-	-0.016*** (0.002)
Region (Urban)	-	-0.297*** (0.088)
Constant	-3.238*** (0.108)	-5.235*** (0.444)
N	11398	11398

Figures in parentheses are robust standard errors; ***p<0.01, **p<0.05, *p<0.1. Model (2) includes control variables: gender, age, educational attainment, marital status, urban household registration, self-rated health status,

number of IADL limitations, number of chronic diseases, self-rated economic status, types of community services available, and regional type.

4.3 Sub Dimension Test

Table 3. Impacts of Various Dimensions of Social Capital on the Utilization of Elderly Care Services

Variable Name	(1) Network Capital	(2) Reciprocity & Interaction Capital	(3) Trust Capital
Network Capital	0.761*** (0.146)	-	-
Reciprocity Capital	-	0.894*** (0.177)	-
Trust Capital	-	-	2.224*** (0.222)
Gender	0.003 (0.063)	-0.002 (0.063)	-0.008 (0.063)
Age	0.012** (0.005)	0.014*** (0.005)	0.011** (0.005)
Educational Attainment	0.037 (0.027)	0.039 (0.027)	0.048* (0.027)
Marital Status	-0.117 (0.075)	-0.098 (0.075)	-0.089 (0.075)
Household Registration Type	0.369*** (0.090)	0.383*** (0.090)	0.364*** (0.092)
Self-rated Health Status	0.045 (0.039)	0.039 (0.039)	0.119*** (0.039)
Number of IADL Limitations	0.078*** (0.024)	0.075*** (0.024)	0.076*** (0.024)
Number of Chronic Diseases	0.216*** (0.019)	0.224*** (0.019)	0.198*** (0.020)
Self-rated Economic Status	0.156*** (0.055)	0.155*** (0.054)	0.164*** (0.055)
Types of Community Services Available	-0.014*** (0.002)	-0.015*** (0.002)	-0.014*** (0.002)
Region (Urban)	-0.313*** (0.090)	-0.355*** (0.088)	-0.405*** (0.089)
Constant	-4.021*** (0.429)	-3.943*** (0.425)	-5.431*** (0.456)
N	11398	11398	11398

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Controls are the same as Model 2 of Table 2.

Table 3 reports the sub dimension regression results of various dimensions of social capital on the utilization of elderly community pension services. Among them, models (1), (2) and (3) respectively test the impact of network capital, mutual capital and trust capital. All models control variables consistent with the benchmark regression, and use robust standard error to estimate.

From the perspective of core explanatory variables, the three dimensions of social capital show a significant positive impact on the use of elderly community pension services, and are significant at the statistical level of 1%, but the impact intensity is significantly different. Among them, the regression coefficient of trust capital is the highest, which is 2.224, indicating that the higher the trust and satisfaction of the elderly to the community environment, the higher the probability of using community pension services, reflecting that a good community trust atmosphere has a key role in promoting service utilization; The second is reciprocal interactive capital, with a coefficient of 0.894, indicating that participation in community mutual assistance, voluntary services and other activities can significantly improve the acceptance and use willingness of the elderly to community pension services; The coefficient of network capital is 0.761, indicating that the larger the scale of individual social network and the closer the contact, the more conducive the elderly to obtain community service information and improve service utilization. This result shows that the role of social capital in promoting the use of community pension services is not a single dimension driven, but the result of

multi-dimensional interaction, of which the impact of community trust is the most prominent.

The influence of control variables was basically consistent with the results of benchmark regression. In terms of individual characteristics, age and urban household registration have a significant positive impact on service utilization; In terms of health and economic characteristics, the number of IADL barriers, the number of chronic diseases, and the coefficient of self-evaluation economic status were significantly positive, indicating that the elderly with poor health and better economic conditions were more inclined to use community pension services; In the aspect of community environment, the coefficient between the types of community service supply and urban areas was significantly negative, which further confirmed the possible mismatch between service supply and actual demand.

From a comprehensive perspective, the sub dimension regression results further revealed the internal mechanism of social capital affecting the use of community pension services. Social capital in different dimensions can effectively improve the service utilization level of the elderly, and the impact intensity shows that trust capital is greater than mutual interaction capital, and greater than network capital. This finding provides a more targeted empirical basis for the follow-up optimization of community pension service supply and the positive role of social capital.

4.4 Robustness Test

Table4. Regression Results of Robustness Tests

Variable Name	(1) Probit Model	(2) Negative Binomial Regression	(3) Instrumental Variable Approach
Comprehensive Social Capital Index	1.904*** (0.161)	4.365*** (0.404)	-
Instrumental Variable	-	-	0.803*** (0.132)
Gender	0.008 (0.033)	-0.076 (0.071)	0.006 (0.063)
Age	0.007** (0.003)	0.004 (0.006)	0.012** (0.005)
Educational Attainment	0.014 (0.014)	0.089*** (0.027)	0.033 (0.027)
Marital Status	-0.069* (0.040)	-0.045 (0.078)	-0.128* (0.075)
Household Registration Type	0.142*** (0.046)	0.092 (0.089)	0.347*** (0.090)
Self-rated Health Status	0.032 (0.020)	0.112*** (0.037)	0.032 (0.039)
Number of IADL Limitations	0.050*** (0.013)	0.182*** (0.032)	0.078*** (0.024)
Number of Chronic Diseases	0.119*** (0.011)	0.171*** (0.021)	0.217*** (0.019)
Self-rated Economic Status	0.092*** (0.029)	0.145** (0.068)	0.152*** (0.055)
Types of Community Services Available	-0.009*** (0.001)	-0.026*** (0.003)	-0.014*** (0.002)

Region (Urban)	-0.146*** (0.044)	-0.185** (0.085)	-0.300*** (0.089)
Constant	-2.846*** (0.233)	-4.674*** (0.478)	-3.992*** (0.428)
Inalpha	-	1.688*** (0.063)	-
N	11398	11398	11398

Robust standard errors are reported in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The control variables are consistent with Model (2) in Table 2.

Table 4 reports the results of the robustness test of this study. In order to verify the reliability of the results of the benchmark regression, a variety of methods were used to carry out the robustness test. All models controlled the variables consistent with the benchmark regression, and robust standard error estimates were used.

The model (1) changed the estimation method and used the Probit model to re estimate the original model; Model (2) replaced the explained variable with the number of community old-age services, and used the negative two regression model to test; Model (3) uses instrumental support as an alternative measurement index of social capital to reflect the actual social support resources of the elderly with the number of family and friends who can help, and test the stability of the core conclusions.

The test results show that under different model settings, the significance and action direction of the core variables are highly consistent with the benchmark regression. In the Probit model, the regression coefficient of the social capital composite index is 1.904, and it is significantly positive at the statistical level of 1%; In the negative two regression with the number of service use as the explained variable, the coefficient of social capital is 4.365, which is also significantly positive at the level of 1%; In

the replacement model of instrumental support, the coefficient of instrumental support was 0.803, still showing a significant positive impact at the level of 1%. This shows that whether it is the replacement of estimation methods, the replacement of explained variables, or the measurement of social capital with the alternative indicator of instrumental support, the positive promotion effect of social capital on the utilization of elderly community pension services remains stable, and the core conclusion has not changed.

The influence of the control variables was also basically consistent with the benchmark regression results. The coefficient direction and significance of the variables such as age, urban household registration, number of IADL barriers, number of chronic diseases, and self-evaluation economic status did not change significantly, further indicating that the model setting has good stability. In general, the results of the robustness test fully prove the reliability and effectiveness of the conclusions of this study, and provide multi-dimensional empirical support for the core proposition of social capital promoting the use of elderly community pension services.

4.5 Heterogeneity Analysis

Table 6. Heterogeneity Analysis Results

Variable Name	Gender Grouping	Gender Grouping	Age Grouping	Age Grouping	Urban-Rural Grouping	Urban-Rural Grouping
	Male (1)	Female (2)	Young-Old (3)	Old-Old (4)	Urban (5)	Rural (6)
Comprehensive Social Capital Index	3.721*** (0.431)	3.437*** (0.408)	3.862*** (0.361)	3.069*** (0.521)	4.000*** (0.479)	3.110*** (0.397)
Control Variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Constant	-5.707*** (0.638)	-4.768*** (0.622)	-4.397*** (0.280)	-3.970*** (0.388)	-5.359*** (0.702)	-4.208*** (0.615)
Observations (N)	5748	5650	8116	3282	4825	6573

Robust standard errors are reported in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The control variables are consistent with Model (2) in Table 2.

Table 5 reports the results of heterogeneity analysis, aiming to investigate whether the impact of social capital on the utilization of elderly community pension services is different among different groups. This study conducted a group test from three dimensions of gender, age and household registration.

From the perspective of core explanatory variables, the comprehensive index of social capital is significantly positive in the six groups,

indicating that the promotion of social capital on the use of community pension services is generally robust across gender, age and urban and rural areas. Among them, the coefficient of male groups is 3.721, slightly higher than that of female groups (3.437), indicating that social capital has a relatively stronger driving effect on the service utilization of male elderly people. The social capital coefficients of young and old people are significantly positive at the level of

1%, and the coefficient of young people is higher than that of old people, reflecting that the impact of social capital on the service utilization of young people is more prominent, which is related to the stronger ability of young people to participate in community activities and obtain service information. In urban and rural samples, the coefficient of social capital is significantly positive at the level of 1%, of which the coefficient of urban elderly is significantly higher than that of rural elderly, indicating that social capital plays a stronger role in promoting the utilization of community elderly care services for urban elderly, which is closely related to the richer urban community service resources and the smoother social capital channels.

In summary, the heterogeneity analysis confirmed that the positive effect of social capital on the utilization of community pension services is highly stable in different groups, which can provide empirical basis for the policy intervention of promoting the utilization of community pension services for the elderly through the construction of community social capital.

5. Conclusion and Enlightenment

5.1 Research Conclusion

Based on the data of 2,020 China Elderly Social tracking survey (CLASS), this study uses 2 yuan Logit model, sub dimension regression, heterogeneity analysis and a number of robustness tests to systematically investigate the impact of social capital on the utilization of elderly community pension services and its internal mechanism. The main conclusions are as follows.

First, social capital has a significant positive effect on the utilization of elderly community pension services. After controlling for variables such as individual characteristics, health status, economic level and community environment, the results still show that the higher the level of social capital, the greater the probability of elderly people using community pension services. The conclusion is still robust in the Probit model, negative two regression and instrumental support substitution test.

Second, the three dimensions of social capital, namely social network capital, reciprocal interaction capital and social trust capital, have an independent and significant positive impact

on the benefits of community old-age services, but the intensity of their respective effects is different. Among them, the effect of trust capital is the strongest, followed by reciprocal interaction capital, and network capital is relatively small. This shows that the community trust atmosphere plays a significant role in promoting the use of community pension services, and the effect of simply expanding the scale of social network is relatively limited.

Third, the positive effect of social capital is significant in gender, age and household registration, with cross group robustness. This finding shows that social capital can cross group differences and generally promote the elderly to actively use community services.

Fourth, among the control variables, age, urban household registration, the number of IADL barriers, the number of chronic diseases and self-rated economic status all significantly positively affect service utilization, while the types of community service supply and urban residential areas are significantly negatively correlated. This result indicates that simply increasing the number of service supply is not equal to improving the utilization rate of services, and the mismatch between supply and demand is an important factor affecting the utilization of community pension services.

5.2 Policy Implications

Based on the above conclusions, this study puts forward the following policy implications.

(1) Strengthen the construction of community trust and reciprocity norms. It was found in the study that the role of trust capital in promoting service utilization is the most prominent. The community can enhance the trust and satisfaction among residents by holding neighborhood mutual assistance activities on a regular basis, establishing residents' discussion platform, and publicizing service information, and reduce the psychological threshold for the elderly to use services.

(2) Optimize the supply structure and quality of community services. Policy makers should pay attention to demand oriented service design to avoid the mismatch of "idle facilities and unsatisfied demand". We can establish a dynamic evaluation mechanism for the needs of the elderly, accurately match the actual needs such as catering, nursing and spiritual consolation, and realize the transformation of service supply from quantity expansion to

quality improvement, so as to essentially benefit the community residents.

(3) Bridge the differences between urban and rural areas and promote the balanced allocation of resources. We will promote the dislocation and complementarity of community services and market-oriented services, increase financial investment in rural community pension services, and narrow the gap between urban and rural services.

In summary, social capital is an important resource for improving the utilization of elderly community pension services. In the future, the policy should be committed to creating a community environment of trust, reciprocity and participation, accurately activating the social capital of different elderly groups, promoting the transformation of community pension services from "have" to "excellent", and truly achieving the strategic goal of positive aging.

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