Is social capital the secret weapon of happiness?

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ABSTRACT

The "county Brahmins" have brought the widespread Self-Reflection of social capital on grassroots populations in China in particular under urbanization. We adopts CFPS data to analyze the theoretical mechanism of action of the impact of social capital on life happiness. The results show that social belonging, social trust, and social interaction can significantly affect the sense of well-being in life. Therefore, providing adequate social support and increasing the level of social capital in the community, such as promoting trust and reciprocity in the neighborhood, is conducive to enhancing people's life satisfaction and promoting their mental health.

Key Words: Social capital; well-being in life; OLS regression

1. Introduction

In contemporary society, people's pursuit of the growing needs for a better life is increasing, which is not only related to personal physical and mental health, but also the "automatic stabilizer" of social harmony(Leung A et al, 2013[1]). From an economic perspective, GDP per capita has long been has long been considered the key indicator of a country's quality of life(Oishi S and Schimmack U, 2010[2]). But Easterlin(1974[3]) shows that economic growth does not bring more happiness. According to the survey data of Gallup World Poll, Share of people who say they are happy was 66.6% in 1993, 83.6% in 1998, but dropped to 76.7% in 2010, following the greater economic development. China's economy is experiencing a period of rapid growth, yet there is a discrepancy between the rising levels of economic prosperity and the fluctuating levels of life satisfaction among its citizens. So we want to know what influences life satisfaction other than income. At a time when policymakers are proposing to improve the well-being of the Chinese people, what perspectives would be more effective?

In order to gain insight into this phenomenon, it is necessary to examine historical cases of similar economic development. In the process of European integration, social capital may offset the personal income and employment welfare happiness because the conflict between economic "hard" environment and social capital "soft" environment (Crowley, F., & Walsh, E. , 2024[6]). According to Helliwell, J. F., & Putnam, R. D. (2004[7]), social capital that was measured by the strength of family, neighborhood, religious and community relationships was found to support physical health and subjective well-being. However, Bartolini, S.(2017[8]) proposed that social capital may also create informal networks, leading to corruption and inefficiency so that GDP growth is dispelled by the negative effects of social capital.

Traditionally, the strong "human feelings" and the concept of land relocation in rural China make social capital become an indispensable intangible asset. The Chinese society is characterised as a "society of connections" and "society of acquaintances"(Li S and Chen, 2012[5]), serving as a form of social capital that played an important role in Chinese society(Wenwen Zhang, 2022[4]). The majority of Western research indicates that the social capital resources derived from religious practice are associated with higher levels of wellbeing among adherents (Lim and Putnam, 2010[11]). Despite China being home to a fifth of the world's population, there has been a paucity of research conducted in the country on the relationships between social capital and health, with even less research conducted on overall well-being(e.g. Knight J et al, 2019[10], Zhang, Y. et al, 2019[9]).

This article makes two main contributions. Firstly, it combines existing indicators of social capital scales, filtering out a scale suitable for measuring social capital in China

through validated factor analysis. This addresses the lack of social capital scales in China. Secondly, it compares the mechanisms of the influence of social capital on life satisfaction between China and the West was examined, and it was found that being within one's own social circle has a greater influence on life satisfaction. This implies that grid governance based on the strong ties of small circles is more effective for social governance. Thirdly, we use micro-survey data from CFPS, which contributes to the empirical data on the impact of social capital on life satisfaction.

The following arrangements of this paper are as follows: the second part is the literature review in terms of social capital, life satisfaction; the third part is the data source and descriptive statistics; the fourth part is the main empirical analysis results; the fifth part is the robustness test and further discussion; and the sixth part is the conclusion and policy enlightenment.

2. Literature Review

2.1 Social Capital

Bourdieu(1983[12]) first proposed the concept of social capital and he believed that the relationship between people should be understood in the social network to which he belongs, and that social capital is the energy and resources brought by the network identity of the actor. Nahapiet and Ghoshal(1998[13]) proposed a tripartite classification of social capital, comprising structural, relational, and cognitive dimensions. In order to provide an accurate representation of the relational social situation in China, it seems that the first two options would be the most appropriate(Zhang, 2019[14]). Structural social capital can be defined as the overall pattern of connections between actors(Burt, R. S., 1992[15]). The concept of relational social capital is concerned with the characteristics of the connection between individuals and other objects, including respect, friendship, trust, and obligations(Nahapiet and Ghoshal, 1998[13]).

Although the World Bank has earlier given a systematic social capital measurement tool SCAT (Social Capital Assessment Tools) (Grootaert & Bastelaer, 2002[16]), it has not yet become recognized due to its complexity, and has since been improved by a number of scholars (e.g. Harpham, 2007[17]). Some scholars have synthesized and analyzed the measurement systems in different articles in order to identify common measures of social capital(e.g. De Silva et al., 2006[18], Kawachi et al, 2004[19]). These include social interaction, sense of social trust, sense of social belonging, social networks, and local groups. Consequently, this paper also attempts to construct social capital from these perspectives.

2.2 Life Happiness

The determinants and correlates of subjective wellbeing have emerged as a pivotal policy objective for numerous countries in recent years(Chen, Y. and Williams, M., 2016[21]). According to Jin Zhang et al(2007[20]), they identified seven factors that contribute to the experience of happiness: intensity, duration, certainty, proximity, multiplicity, purity and extension. Besides, on 17 March 2013, China's new leader, Xi Jinping, introduced a new slogan, 'the China Dream', at the Party Congress. This was accompanied by the following statement: 'The China Dream is about strengthening the state and making it powerful and prosperous; achieving a renaissance of the Chinese nation; and promoting the happiness of the people'(Xi, J. 2013[23]). It is important for policymakers to survey what can measure happiness.

The degree of satisfaction with life standards is a factor in attaining happiness (Borooah, 2006). Furthermore, general satisfaction with life is the best predictor of happiness (Lyubomirsky et al., 2006).To measure subjective well-being, Becky Hsu(2017[22]) compares between subjective well-being measures that fit China, including self-scoring, social status, income, which are also supported by Wenwen Zhang(2022[4]).

3.3 Hypothesis

In the past, scholars have typically focused their research on factors that influence life satisfaction, including income[39], higher education[40], health status[41]. As posited by Gundelach and Kreiner, social capital represents the most significant predictor of subjective well-being, with the two variables exhibiting a high degree of correlation.

Some Western scholars have found a positive effect of social capital on life satisfaction, but there are significant differences between Chinese and Western social capital. According to Zhang, Hongjuan et al.(2019[14]), Chinese has two significant uniqueness: Confucianism, which emphasizes social norms and reciprocity, and undergoing a transformation from the central-planned economy to a market economy. They also found Chinese use informal guanxi that is very different from West. And in the transition to a market economy, there are large differences between urban and rural areas and regions with high and low population densities. Therefore, we formulate hypotheses from the following three aspects(Zhang S et al., 2023).

The influence between social belonging and life satisfaction. For example, China is distinguished by a proclivity for clannishness and the absence of overarching norms for society as a whole (Fukuyama, 1995[27]). Additionally, the Chinese tend to place greater importance on close and strong relationships((Wu and Leung, 2005[28]). Social belonging involves feeling deeply connected to, belonging to and integrated with a social group or

community(Allen KA et al., 2021[30]). Therefore, we use political participation and assessment of government to measure social belonging. Some scholars believe that residents and democratic political relations increase life satisfaction(Loubser, R., and C. Steenekamp. 2017[31], Liu, H. et al.,2020[32]). Additionally, the presence of unions in the workplace can have a positive impact on the lives of employees. Unions can protect workers' jobs, provide a comfortable working environment and enhance job security, which in turn can lead to higher levels of life satisfaction(Pfeffer, J. et al, 1990[34]).

In advanced democracies, the quality of the democratic process is a more significant determinant of happiness than in less developed countries(Helliwell, J. F. et al, 2008[35]). However, Grass-roots democracy in China is shorter than in the West, the democratic process is more costly and decisions are made mainly to satisfy the demands of powerful groups, and a high level of participation is associated with a high level of life satisfaction(Tang, L. et al., 2020[33]). Besides, life satisfaction was lower among citizens involved in non-institutionalized political participation. Ma, B. et al.(2022[36]) also been pointed out that the Chinese tend to view democracy in terms of substantive results or outcomes, rather than process, and thus substantive participation is not high. Wenfang, W. (2024[37]) argued that restrictions on worker participation limit the ability of Chinese employers' associations to coordinate industrial relations, leaving workers not only unable but also unable to improve their well-being through greater job satisfaction. In particular, it is frequently observed that citizens exhibit a higher level of satisfaction with the central government than with lower-level administrations. However, this satisfaction tends to decline with each subsequent level of government(Tony Saich,2016[38]). The level of government that is most relevant to the life satisfaction of people at the grassroots level tends to be the lowest level of government, and thus the actual government ratings are not considered to be particularly high. Based on this, we propose the following hypothesis:

H1: Social belonging reduces life satisfaction.

In rural areas, people are more closely connected to each other and there is more daily contact and interaction between neighbors(Bourke, L. et al., 2022[42]). Social capital can be defined as the network of relationships based on mutual trust and reciprocity, and the potential resources that arise from them(Claridge, T., 2004[43]). A high level of social capital means that rural residents have more social support systems and are able to obtain emotional support, practical help and resources from friends and family, according to a study in East Asian(Lo, T.-Y. et al., 2022[44]). This social network not only engenders feelings of safety and esteem, but also alleviates the stress of life by providing assistance in challenging times. Furthermore, robust social capital fosters trust, collaboration, and mutual comprehension, reduces conflict, and maintains a harmonious and orderly community environment(Sharma, S., 2024[45]). This kind of amicable interpersonal atmosphere enhances life satisfaction and happiness. It can

therefore be reasonably assumed that in a more connected environment, such as the countryside, the level of social capital will be higher, leading to a greater sense of well-being. In light of the aforementioned considerations, this paper evaluated the following hypotheses:

H2: Social capital increases more happiness of rural residents.

In areas of low population density, limited population size and long distances between people, the potential for the establishment of strong social networks is reduced(2014[46]). This can subsequently hinder the potential for collective action, resource sharing and information exchange(Khan, S.R. et al., 2021[47]). Similarly, in urban environments characterized by a fast pace of life, anonymity of interpersonal interactions and mobility of people, the establishment of lasting social bonds and mutual trust is hindered(Mpanje, D. et al., 2018[48]). The absence of a solid social structure impairs the ability to utilize social capital effectively, as shared norms, reciprocity and mutual support, the necessary foundations for the utilization of social capital, are diminished(Zhang, H. et al., 2021[49]). Furthermore, the absence of social cohesion serves to exacerbate existing inequalities(Cook, K., 2014[50]). Those with poor access to social capital will face greater barriers in accessing resources, opportunities and support systems. The following hypotheses were examined:

H3: Low population density and urban areas where social interactions are more difficult to leverage through social capital.

3. Data

3.1 Data Sources

The data of this paper are from 2020 China Family Panel Studies(CFPS). We choose this dataset based on two main benefits: Firstly, CFPS is provided by the China Social Science Survey Centre of Peking University, which is one of the most authoritative and largest survey data in China at present, and it can provide a good guarantee for the validity and credibility of this study; Secondly, CFPS investigates the respondents' basic personal information, family, employment, social security, and attitudes, and it can provide rich variable information for this study.

All the data needed for this study come from both the individual and family datasets. Since the individual pool includes data on adolescents aged 9 to 15 and data on surrogate responses due to physical and other reasons, this part of the sample is not applicable to the analysis of fertility intentions, and its information has more missing on some key variables, so this part of the non-compliant data is removed. Based on privacy and different regional differences, such as voting, membership of labor associations and other overwhelmingly

inapplicable, this part of the data was also removed. The final number of observations in the sample after clearing was 13,936.

3.2 Method

In this study, the observed variables of social capital extracted from the CFPS questionnaire were initially subjected to Exploratory Factor Analysis (EFA) to identify their underlying dimensions. The fundamental principle of exploratory factor analysis is to reduce the original observed variables to a smaller number of potential common factors through linear combination. Each observed variable can be represented as consisting of both common and unique factors. The common factor reflects the common variation among the observed variables, while the unique factor represents the specific variation of the variable. By estimating the factor loadings of each observed variable on the different factors, it is possible to determine which variables are attributable to the same underlying factor. We chose Principal Component Analysis (PCA) to extract the factors and then performed orthogonal rotation of the factors to obtain a simpler and easier to interpret factor structure. The model is following:

$$X=\Lambda F+\epsilon$$

where X is the matrix of variables for the social capital construct, F is the matrix of common social capital fitting factors, Λ is the matrix of factor loadings, and ϵ is the matrix of unique factors. The objective of the model is to estimate Λ and F such that the overall variation in the observed variables is maximally explained by the social capital fitted factors.

Following the extraction of potential theoretical factors from the original observed variables through the use of exploratory factor analysis, this study employs Ordinary Least Squares (OLS) to construct a linear regression model with the objective of testing the effect of social capital on a dependent variable. The OLS linear regression model can be formally expressed as follows in this study:

$$Y=\beta_0+\beta_1 X_1+\beta_2 X_2+...+\beta_k X_k+\epsilon$$

The dependent variable, Y, is a function of the independent variables, X_1, X_2, … X_k represents the independent variable, which in this case is the social capital correlation factor extracted by EFA. β_0 is the constant term, while β_1, β_2, and so on represent the regression coefficients of each independent variable. The regression coefficient of each independent variable is denoted by β_k, while ϵ represents the residual term. The objective of this study is to quantify the degree of influence of social capital on life satisfaction and to deepen the understanding of the mechanism of social capital. To this end, an OLS linear regression model has been constructed.

3.2 Data Selection

According to the literature and the questionnaire setting, the following variables were selected to measure social capital.

Table 1 Indicator of Social Capital

Social Communication	1	[Mobile device Internet access time (minutes)] Normally, how long do you use mobile devices to surf the Internet every day?
	2	[Contact Frequency] In the past 6 months, how have you often contacted your children by phone, text messages, letters or e-mail? 1. almost every day 2. 3-4 times a week 3. 1-2 times a week 4. 2-3 times a month 5. once a month 6. once every few months 7. never
	3	[Frequency of Moments] In the past year, how often did you share your work or life in Moments? 1. almost every day 2. 3-4 times a week 3. 1-2 times a week 4. 2-3 times a month 5. once a month 6. once every few months 7. never
	4	[Most people are helpful or selfish] Do you think most people are helpful or selfish?1. Most people are helpful. 0. Most people are selfish.
	5	[Who to tell trouble] when you encounter trouble, the main to tell who?1. Never tell others 2. Parents 3. Brothers and sisters 4. Grandpa / grandma 5. Others at family 6
Social Trust	6	[Trust in your neighbors] How much do you give your trust in your neighbors)? (0 means great distrust, 10 means great trust.）
	7	[Like trust or doubt others] Generally speaking, do you think most people can trust, or be more careful the better?1. Most people can trust 0. The more careful you are with people, the better
	8	[Trust in strangers] your strangers (how much can you trust)? (0 means great distrust, 10 means great trust.）
	9	[The importance of others] the importance of others to your information? (1 Represents very unimportant, 5 represents very important.）
	10	[Trust in local government officials] How can you trust local government officials)? (0 Points represents great distrust, and 10 means great trust.）
Social return feel	11	[Evaluation of the county and municipal government] Your overall evaluation of the work of the county or county city / district government last year is: 1. Great achievements 2. certain achievements 3. no much achievements 4. no results 5. worse than before
	12	[Family relationships] How important are family social relationships to children's future achievements (0 is the least important, 10 is the most important)?

	13	[Village / neighborhood committee election voting] In the last five years, have you ever voted in the village / neighborhood committee election?1. Yes, 0. No
Social Network	14	[Main channels to obtain jobs] Among these job-hunting channels you just mentioned, which channel has played the most important role in getting this job?1. Contact the employer directly. 2. Employment introduction agencies, recruitment advertisements, job advertisements, or participate in talent exchange meetings / job fairs. 3. State assignment/organizational transfer 4. referral by relatives, friends or acquaintances 5. school career guidance agency, or school recommendation
	15	[Relations is more important than ability] In today's society, social relationship is more important than individual ability. 1. strongly disagree 2. disagree 3. agree 4. strongly agree 5. neither agree nor disagree
	16	[Have you get help from others] Have you been helped by others in this job?1. Yes, 0. No
Local groups	17	[Are you a member of the self-employed Association] Are you currently a member of the self-employed Association?1. Yes, 0. No

The Table 1 selected the 24 questions in the questionnaire as variables to measure social capital to facilitate data processing. In "Who to tell trouble", the 2-5 option as "relatives", 6-9 as "acquaintances", "counseling personnel", so discard the option to create virtual variables; in the "Main channels to obtain jobs", 4 as "relatives", 2,3,5 as "social channels", and then create virtual variables.

Table 2 Indicator of Happiness

	[How happy (score)] If 0 is the lowest and 10 is the highest, how happy do you feel that you are?
	[To your life satisfaction] 1 very dissatisfied, 5 very satisfied, do you give your life satisfaction?
Life Happiness	[Your status] 1 is very low, 5 is very high, how do you give yourself your local social status?
	[Your income is local] 1 is very low, 5 is very high, do you give your income in the local position?

We measures personal life happiness through self-rated happiness, life satisfaction, social status and income status, thus selecting the above questionnaire questions following as Table 2. This article also chooses Sex (1 is male, 0 is female), Education (0. uneducated 3. primary school 4. junior high school 5. high school / technical secondary school / technical school / vocational school 6. junior college 7. University undergraduate 8. Master 9. PhD), Age, Nature (if 0 points represent the lowest, 10 points represent the highest, how good do you think your popularity relationship?) , Religious belief (1 for yes, 0 for no), Self-rated health (1. very healthy 2. very healthy 3. relatively healthy 4. general 5. unhealthy) as control variables.

3.2 Confirmatory factor analysis

Exploratory Factor Analysis (EFA, Gorsuch, R. L. , 1988[26]) is the process of exploring the characteristics, properties, and internal correlations of a set of measurable variables and revealing how many of the major underlying factors may affect these variables. Each potential factor of social capital is independent of each other, and these independent potential factors should summarize as much information as possible about the original measurable variables, which is suitable for exploring the original data at the beginning of the study.

Table 3 reports the results of the factor analysis of the above preset items, marking the value exceeding 0.6 under each factor(Gorsuch, R. L. , 1988[26]). We sought to find the underlying factors behind the observed variables, each representing a set of correlated variables. Here there are five factors, and each variable has a load on each factor, indicating the degree to which that variable is correlated with that factor. The larger the absolute value of the load, the stronger the association of the variable with the factor. For example, "mobile device Internet duration" has a payload of 0.7380 on Factor 3, which means that "mobile device Internet duration" is highly related to Factor 3."Uniqueness" indicates the part of that variable that cannot be explained by other factors. For example, the uniqueness of "mobile device Internet access duration" was 0.4310, which means that 43.10% of the variation cannot be explained by these five factors.

Table 3 First Confirmatory factor analysis

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Uniqueness
Internet time for mobile devices	0.0821	0.1280	0.7380	-0.0307	0.0139	0.0080	0.4310
Contact frequency	0.1110	-0.1675	-0.6599	-0.0814	0.0151	0.0632	0.5133
Moments to share the frequency	0.1259	0.1770	0.7843	-0.0223	-0.0041	-0.0473	0.3350
Most people are still helpful or selfish	0.6527	0.6140	-0.0803	0.0089	0.0079	0.0012	0.1903
Who to tell the trouble _ relatives	-0.4248	0.4883	-0.1113	0.6930	-0.2144	-0.0408	0.0408
Who to tell the troubles _ acquaintances	-0.3755	0.4483	-0.0030	-0.7227	-0.3047	0.0227	0.0425
Who to tell the trouble _ yourself	-0.2293	0.2441	-0.0061	-0.0625	0.9291	0.0526	0.0179
Trust in your neighbors	0.5530	0.4643	-0.2367	0.0001	-0.0254	0.0112	0.4218
Like to trust or doubt others	0.6629	0.6022	-0.0820	0.0088	0.0093	0.0014	0.1910
Trust in strangers	0.4694	0.3996	0.0994	-0.0158	0.0028	0.0118	0.6097
Others tell the importance	0.4747	0.4699	0.0810	0.0081	0.0154	-0.0215	0.5466
Trust in local government officials	0.3829	0.5345	-0.1791	-0.0290	-0.0271	0.0305	0.5331
Evaluation of the county government	0.8141	-0.4958	0.0802	0.0067	0.0011	-0.0095	0.0849
There is a relationship at home	-0.4557	0.6484	0.1128	0.0107	0.0096	-0.0046	0.3591
Village neighborhood committee election voting	0.8429	-0.4899	0.0221	-0.0009	-0.0006	-0.0079	0.0489
Get the main channel of work _ relatives	0.0090	-0.0029	0.0368	0.0478	-0.0400	-0.5271	0.7168
The main channel of obtaining work _	0.0122	-0.0010	0.0701	0.0819	-0.0800	0.8385	0.2788

social channel							
Relations is more important than ability	0.6451	0.4339	-0.0653	0.0160	0.0321	-0.0158	0.3898
Whether to get help from others	0.1140	-0.0660	0.4341	0.1151	-0.0441	0.0901	0.7709
Whether he is a member of the individual workers' association	0.8494	-0.4884	0.0520	0.0016	-0.0008	-0.0078	0.0372

Visualizing the results as shown in Fig 1, it is determined that three factors should be retained as appropriate. Because "contact frequency", "who to tell troubles _ acquaintance", "main channel _ relatives" and "whether to get help from others" are less than 0.4 on any factor load, these three variables do not provide effective factor information, so these variables are discarded. It is worth noting that although "trust in strangers", "tell the importance of others" factor load is less than 0.4, noticed that the same problem in the different factor analysis process results may be different, and the two problems for social capital construction, so keep and continue the second factor analysis.

Figure 1 Scree Plot of Eigenvalues after Factor
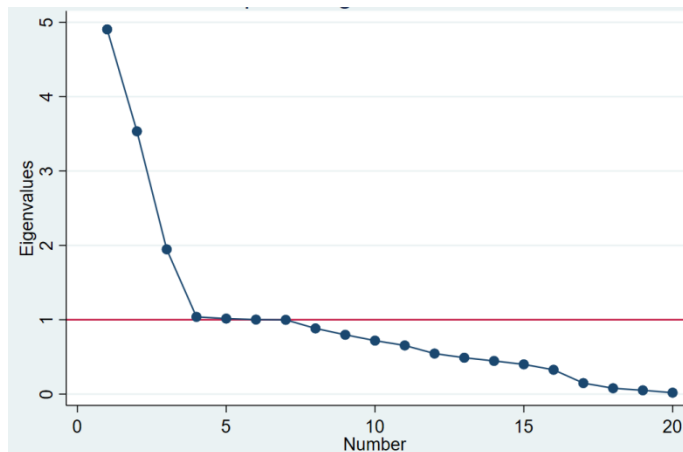
Table 4 reports the results of the second factor analysis, which filters the four problems of "who to tell your troubles _ acquaintances", "family relationship", "main channels to work _ social channel" and "whether to get help is less than 0.4 from others". Since the optimal number of factors obtained in the factor analysis is 3, while in Factor 4, only one variable is included, this variable was filtered.

Table 4 Second Confirmatory factor analysis

Variable	Factor1	Factor2	Factor3	Factor4	Uniqueness
Internet time for mobile devices	0.0032	0.0249	0.8210	-0.0268	0.3246
Moments to share the frequency	0.0141	0.0895	0.8055	-0.0456	0.3408
Most people are still helpful or selfish	0.0942	0.8932	0.0535	-0.0033	0.1905
To who to tell the trouble _ relatives	-0.7382	0.1273	-0.0598	0.5859	0.0920
To whom to tell the troubles _ acquaintances	-0.5007	0.0773	0.0234	-0.8021	0.0995

Trust in your neighbors	0.1092	0.7427	-0.1362	-0.0049	0.4179
Like to trust or doubt others	0.1088	0.8908	0.0562	-0.0002	0.1915
Trust in strangers	0.1012	0.5851	0.1965	-0.0180	0.6084
Others tell the importance	0.0572	0.6439	0.1918	-0.0037	0.5454
Trust in local government officials	-0.0606	0.6737	-0.0689	-0.0480	0.5353
Evaluation of the county government	0.9343	0.1477	0.0585	0.1111	0.0894
There is a relationship at home	-0.7586	0.1684	0.1822	-0.0860	0.3556
Village neighborhood committee election voting	0.9497	0.1792	0.0114	0.1073	0.0544
The main channel of obtaining work _ social channel	-0.0077	-0.0032	0.1001	0.1540	0.9662
Relations is more important than ability	0.2061	0.7517	0.0396	0.0201	0.3904
Whether to get help from others	0.1248	-0.0449	0.4739	0.1503	0.7352
Whether he is a member of the individual workers' association	0.9544	0.1801	0.0397	0.1095	0.0431

In summary, the final analysis results are as follows:

Table 5 Final Variable Selection

Social Belonging	Evaluation of the county government
	Village neighborhood committee election voting
	Whether he is a member of the individual workers' association
Social Trust	Trust in your neighbors
	Trust in local government officials
	Relations is more important than ability
	Trust in strangers
	Others tell the importance
	Most people are still helpful or selfish
	Like to trust or doubt others
Social Interaction	Moments to share the frequency
	Internet time for mobile devices

3.3 Descriptive Statistics

Table 6 reports the descriptive statistics of the variables with 13936 samples. As gender is a virtual variable, it can be known that 51.5% of the samples are male, and the average education was 2.669. It can be seen that most of the samples had a low education level and the average personality was 7.015, indicating that most of the samples thought that they were relatively popular, the other 1.9% had religious beliefs, and most of the samples thought that they were in good health.

To eliminate the effect of dimension, the normalization of the variables of the normal

distribution independence and the linear combination of the core variables. In addition, due to the lack of data of "mobile device Internet duration", which has a great impact on the results, this variable is ignored here and only "sharing frequency of friends circle" is used to measure social interaction. According to the table, the standard deviation of social belonging was 1.762 and social interaction was 1.306, while the standard deviation of social trust was 3.418, and the standard deviation of life happiness was 2.524, with a large deviation.

Table 6 Descriptive Statistics

	Num	Ave	S.D	Min	Medium	Max
Sex	13936	0.515	0.500	0.000	1.000	1.000
Education	13936	2.669	1.364	0.000	2.000	8.000
Age	13936	37.705	13.455	16.000	35.000	86.000
Nature	13936	7.015	1.718	-1.000	7.000	10.000
Religion Belief	13936	0.019	0.136	-1.000	0.000	1.000
Health	13936	2.715	1.091	-8.000	3.000	5.000
Social Belonging	13936	-0.000	1.762	-2.498	-0.228	9.468
Social Trust	13936	0.000	3.418	-13.186	0.295	11.905
Social Interaction	13936	0.000	1.306	-3.351	0.104	8.503
Happiness	13936	0.000	2.524	-9.540	0.210	8.148

Table 7 shows the correlation analysis matrix between the three measures of social capital, showing the correlation between the four variables of Social Belonging, Social Trust, Social Interaction and Happiness. The correlation coefficient between social belonging and social trust was-0.135, -0.095, and-0.076, indicating a mild negative correlation between them. Represents a mild negative correlation between them. The correlation coefficient of social trust and well-being was 0.243, indicating a certain positive correlation between them. Moreover, the absolute values of these correlations are small, indicating that there is no mutual substitution between these variables.

Table 7 Correlation between the variables

	Social Belonging	Social Trust	Social Interaction	Happiness
Social Belonging	1.000			
Social Trust	-0.135	1.000		
Social Interaction	-0.095	-0.023	1.000	
Happiness	-0.076	0.243	-0.030	1.000

4.Empirical analysis

4.1 Life happiness and social capital

According to the sample data, Table 8 is the 2020 cross-section data regression results. It can be seen that, after controlling for individual characteristics, the influence of social belonging, social trust, and social interaction on life satisfaction was significant at the 1% level. The target variable was life well-being, and the explanatory variables included gender, education, age, personality, religion, health, social belonging, social trust, and social interaction. The coefficient of each explanatory variable represents how life well-being would change for each additional unit of that variable when the other variable remains constant.

Social Belonging is the individual's identification and satisfaction with the community. The sense of social belonging has a significant impact on life satisfaction shows that the individual's behavior and decision-making. A strong sense of social belonging may promote individuals to participate more in community activities and be more willing to abide by community norms, thus affecting the economic development of the community and the welfare of individuals. Social trust coefficient is 0.1564, and social trust can promote the cohesion of the community to reduce transaction costs and promote cooperation, thus improving social efficiency and individual well-being. Social interactions are the foundation of social networks that can provide information, resources and support that can affect the welfare of the individual. Social interaction coefficient of 0.0013, the coefficient at 1% significance level is not significant, this may be because the effect of social interaction may be affected by the quality of interaction and individual personality, because the circle of friends frequency mainly reflected in the mobile media communication, and this is often out of the nature of work, or release their perceptual information and don't care about others, and lack of realistic evidence, this may be social interaction in the data set significance level slightly lower than the cause of social trust and social sense of belonging.

From other influencing factors, the coefficient of gender is-0.0749, indicating that men may be 0.0749 units lower than women, which may be due to the influence of socioeconomic structure and gender role; the coefficient of education is-0.0519, indicating that education may bring higher expectations that may not be met. The coefficient of personality is 0.1950, and better individuals will increase their happiness. The coefficient of health was-0.1867, noting that the lower the health score, the better the self-rated health, confirming that health problems may lead to lower quality of life, thus reducing happiness.

Table 8

	Happiness in life
Sex	-0.0782***
	(-5.0377)
Education	-0.0507***
	(-8.7895)
Age	0.0001
	(0.1600)
Nature	0.1954***
	(38.9430)
Religious Faith	0.0663
	(1.1827)
Health	-0.1873***
	(-23.0553)
Sense of social belonging	-0.0434***
	(-5.1105)
Social Trust	0.1565***
	(18.0205)
Social Interaction	0.0176**
	(2.3133)
_cons	-0.6920***
	(-13.5579)
N	13936
adj. R^2	0.230

t statistics in parentheses

* $p < 0.1$,   ** $p < 0.05$,   *** $p < 0.01$

4.2 Analysis of urban-rural disparities

Due to the existence of urban-rural dual structure in China, there is a great difference between social capital in urban and rural areas. For the consideration of rural Chinese cultural tradition, the role path of social capital is different in the urban and rural social connection. Cities often have more complex social networks, more social organizations, and more opportunities for social interaction. While rural communities may be more dependent on family and kinship, social networks may be simpler, and there may be less opportunities for social organization and interaction, in addition, urban culture may emphasize more individualism and competition, while rural culture may emphasize more collectivism and cooperation, cities may be affected by more public services and social security policies, rural

may be more influenced by land and agricultural policies, cities usually have more abundant material resources, such as education and medical facilities, and more employment opportunities, while rural areas may lack these resources, which may affect the formation and use of social capital.

Table 9 reports the regression results of the relationship between life happiness and social capital in different urban (1) and rural (2) households. In both models, gender, education, personality, health were similar and the same regression results in the whole sample. Interestingly, in cities and towns, the influence of religious belief on life satisfaction is significant at the 5% level, which may be that the urban life is more stressful, and the people with religious beliefs seek spiritual sustenance, which can improve the individual sense of gain and spiritual comfort, and then improve the individual happiness. In the town model, social sense of belonging has a significant negative impact on life happiness (coefficient of 0.0673), and in the rural model, the effect is not significant (coefficient of 0.0171), this may reflect the cultural differences between urban and rural, for example, urban residents may pay more attention to individual freedom and diversity, and rural residents may pay more attention to the cohesion of the community, and tradition. In rural model, social interaction on life happiness has a significant positive effect (coefficient is 0.0269), and in the urban model, the effect is not significant (coefficient is 0.0161), this may be because in the countryside, community relations and interaction may be more closely, life circle and daily circle, friends share frequency can spread to the object in real life, so the impact on life happiness may also be greater. In both models, the influence of social trust on life happiness was significant, and the coefficients were similar (0.1486 in town and 0.1672 in village), confirming that social trust can promote community cohesion and improve individual happiness.

Table 9

	(1)	(2)
	Happiness in life	Happiness in life
Sex	-0.0521***	-0.0986***
	(-2.6211)	(-4.0161)
Education	-0.0538***	-0.0456***
	(-7.0139)	(-4.3991)
Age	0.0007	-0.0013
	(0.9174)	(-1.2072)
Nature	0.1949***	0.1924***
	(31.7076)	(27.4587)
Religious Faith	0.1700**	-0.0015
	(2.3492)	(-0.0169)
Health	-0.1896***	-0.1851***

	(-19.4088)	(-16.3594)
Sense of social belonging	-0.0673***	-0.0171
	(-6.3323)	(-1.4123)
Social Trust	0.1486***	0.1672***
	(14.5305)	(13.2585)
Social Interaction	0.0161	0.0269**
	(1.6406)	(2.1505)
_cons	-0.7117***	-0.6110***
	(-11.2162)	(-8.2450)
N	7570	5462
adj. R^2	0.228	0.234

t statistics in parentheses

$^* p < 0.1$, $^{**} p < 0.05$, $^{***} p < 0.01$

5. Robustness test

5.1 The population density is divided into samples

Population density may influence the formation and operation of social capital, and the impact of social capital on life satisfaction. In places with high population density, people have more opportunities to conduct social interaction, and the quality of social interaction may vary according to the population density, individuals may be more difficult to obtain resources due to competition pressure, and due to space tension and resource competition, social pressure and conflict may increase, which may affect the operation and effect of social capital.

According to the results of the provincial administrative area and the seventh census of the Ministry of Civil Affairs and the National Bureau of Statistics, the population density is calculated, and the results are obtained as Table 10.

Table 10

ranking	Provincial administrative region	Area (km 2)	Seven general permanent resident population (ten thousand	density of population (Person / km²)	ranking	Provincial administrative region	Area (km²)	Seven general permanent resident population (ten thousand	density of population (Person / km²)

		people)					people)		
1	Macao	33	68	20704	18	Liaoning	148000	4259	288
2	Hong Kong	1114	747	6709	19	Hainan	35400	1008	285
3	Shanghai	6340	2487	3923	20	Jiangxi	166900	4519	271
4	Beijing	16418	2189	1333	21	Shanxi	156700	3492	223
5	Tianjin	11934	1387	1162	22	Guizhou	176167	3856	219
6	Jiangsu	107200	8475	791	23	Guangxi	237600	5013	211
7	Guangdong	179725	12601	701	24	Shaanxi	205600	3953	192
8	Taiwan	36014	2356	654	25	Sichuan	486000	8367	172
9	Shandong	155800	10153	652	26	Jilin	187400	2407	128
10	Zhejiang	105500	6457	612	27	Yunnan	394100	4721	120
11	Henan	167000	9937	595	28	Ningxia	66400	720	108
12	Anhui	140100	6103	436	29	Heilongjiang	473000	3185	67
13	Hebei	188800	7461	395	30	Gansu	425800	2502	59
14	Chongqing	82370	3205	389	31	Neimenggu	1183000	2405	20
15	Fujian	124000	4154	335	32	Xinjiang	1664900	2585	16
16	Hunan	211800	6644	314	33	Qinghai	722300	592	8
17	Hubei	185900	5775	311	34	Xizang	1228400	365	3

Except for Hong Kong, Macao and Taiwan, ranking 1 to 17 were classified as provinces with high population density, and 18 to 34 were classified as provinces with low population density. There were 7,234 samples from areas with high population density and 6,311 samples from areas with low population density.

Table 11 reports the regression results of the sample divided based on the population density. In the control variables of the model, there was little difference between high and low population density, but the two varied significantly in social interaction. In the model with high population density, social interaction had a significant positive effect on life well-being (coefficient 0.0238), while in the model with low population density, this effect was not significant (coefficient 0.0102). This may be because in places with high population density there are greater opportunities for social interaction and potentially greater effects on life wellbeing. In both models, the impact of social trust on life happiness was significant, and there was a significant negative impact of social belonging on life happiness (high population density is-0.0380, and low population density is-0.0462), confirming the previous conclusion on the significant impact of social capital on life satisfaction.

Table 11

	(1)	(2)
	Life Happiness	Life Happiness
Sex	-0.0686***	-0.0919***

	(-3.3708)	(-3.9686)
Education	-0.0653***	-0.0340***
	(-8.0711)	(-3.9755)
Age	0.0003	0.0001
	(0.3907)	(0.1491)
Nature	0.2028***	0.1857***
	(32.4698)	(27.6947)
Religious Faith	0.0707	0.0480
	(0.9571)	(0.5762)
Health	-0.1894***	-0.1840***
	(-18.8864)	(-17.0480)
Sense of social belonging	-0.0380***	-0.0462***
	(-3.5897)	(-3.9101)
Social Trust	0.1424***	0.1687***
	(13.5042)	(14.3384)
Social Interaction	0.0238**	0.0102
	(2.3415)	(0.8844)
_cons	-0.7136***	-0.6683***
	(-11.1690)	(-9.5409)
N	7234	6311
adj. R^2	0.237	0.221

t statistics in parentheses

$^{*} p < 0.1$, $^{**} p < 0.05$, $^{***} p < 0.01$

5.2 Fixed-effects model testing based on the panel data

Another concern is that social capital in different years has different effects on life satisfaction. Combined with the CFPS data in 2018, time is taken as a virtual variable. Due to the lack of two variables: the frequency of friends sharing and neighborhood voting in the 2018 questionnaire, the fitting results after abandonment are as follows. It can be found that social capital has a significant effect on life satisfaction after controlling for individual characteristics and time. Among them, social trust reflects the cohesion and trust level of communities, as well as individual values and trust tendencies.

Table 12

Life Happiness

Sex	-0.0977***
	(-12.1569)
Education	-0.0086***
	(-8.3372)
Age	0.0043***
	(16.8057)
Nature	0.1618***
	(74.9700)
Religious Faith	0.0831***
	(3.4000)
Health	-0.1356***
	(-39.1632)
Sense of social belonging	-0.0559***
	(-13.7247)
Social Trust	0.1472***
	(35.1213)
2018.year	0.0000
	(.)
2020.year	0.0000
	(.)
_cons	-0.8924***
	(-42.9569)
N	50796
adj. R^2	0.190

t statistics in parentheses

$^{*}\, p < 0.1$, $\quad ^{**}\, p < 0.05$, $\quad ^{***}\, p < 0.01$

5.3 Bootstrap bootstrapping test

There is another concern for statistical analysis method, before the use of parametric method in multiple regression analysis, now considering that the sample is sampled, then sampling from the sample, the benefits of Bootstrap method is not need to make any assumptions about the distribution of the data, by changing the number of Bootstrap sampling, can assess the influence of sample size on the statistical results, so as to better understand the robustness of the model under different sample sizes. The results obtained after the replacement sampling times of 100,250,500 and 1000 are shown in the following table, respectively. It can be found that the previous conclusions have not changed, so our analysis

is robust.

Table 13

	(1)	(2)	(3)	(4)
	Life Happiness	Life Happiness	Life Happiness	Life Happiness
Sex	-0.0782***	-0.0782***	-0.0782***	-0.0782***
	(-4.3076)	(-5.1263)	(-5.2654)	(-5.2292)
Education	-0.0507***	-0.0507***	-0.0507***	-0.0507***
	(-8.8182)	(-8.8063)	(-8.9849)	(-8.9056)
Age	0.0001	0.0001	0.0001	0.0001
	(0.1436)	(0.1764)	(0.1739)	(0.1719)
Nature	0.1954***	0.1954***	0.1954***	0.1954***
	(36.7838)	(40.6236)	(36.7152)	(37.4075)
Religious Faith	0.0663	0.0663	0.0663	0.0663
	(1.2771)	(1.1643)	(1.2257)	(1.1444)
Health	-0.1873***	-0.1873***	-0.1873***	-0.1873***
	(-22.1085)	(-25.2828)	(-25.0056)	(-24.0880)
Sense of social belonging	-0.0434***	-0.0434***	-0.0434***	-0.0434***
	(-5.3656)	(-5.5251)	(-5.7479)	(-5.4786)
Social Trust	0.1565***	0.1565***	0.1565***	0.1565***
	(19.9924)	(18.1304)	(19.3602)	(18.5951)
Social interaction	0.0176***	0.0176**	0.0176**	0.0176**
	(2.6271)	(2.3504)	(2.2904)	(2.2552)
_cons	-0.6920***	-0.6920***	-0.6920***	-0.6920***
	(-13.1457)	(-13.4659)	(-13.1244)	(-13.2137)
N	13936	13936	13936	13936
adj. R^2	0.230	0.230	0.230	0.230

t statistics in parentheses

$^{*} p < 0.1$, $^{**} p < 0.05$, $^{***} p < 0.01$

6. Further Analysis

6.1 Household social capital and life satisfaction

CFPS also provides data at the economic level of the household. In this paper, the following variables in Table 14 in the household questionnaire are selected as the explanatory

variables and the explained variables to measure the impact of social capital and life satisfaction at the household level.

Table 14

|	
Social Network	[Neighborhood relationship] Overall, what do you think of the neighborhood relationship in the village / community you live in is 1. Very good 2. better 3
	[Neighbor help] If you need your neighbor's help, do you think anyone will help you?1. There must be 2. There may be 3. No.4
	[Preferred borrowing object] if you need to borrow a large sum of money (for example to buy a house, business turnover, etc.), the preferred borrowing object will be 0. Parents or children 1. 2. Friends 2. Banks 4. The bank other formal financial institutions 5. Private lending institutions or relatives and friends of personal 6. Under any circumstances won't go to borrow money
	[Feeling for the community] Do you have feelings for the village / community where you live, yes: 1. Very emotional 2
Social Support	[Monthly post and telecommunications fee (yuan / month)] On average, your home mail, communication expenses, including telephone, mobile phone, Internet access, mail, etc., how much yuan?
	[Financial Assistance to Others (RMB / year)] In the past 12 months, excluding social donations, how much is the cash or physical financial assistance that your family has provided to others (such as friends and colleagues) worth?
	[Social donation expenditure (RMB / year)] In the past 12 months, including cash and physical discount (such as food, clothing, etc.), how much is your social donation expenditure?
	[Gift expenditure (RMB / year)] Including cash and physical discount, how many yuan has your family spent in the past 12 months?
	[Money given by others (yuan / year)] Excluding social donations, how much cash or physical financial help has your family received from others (such as friends or colleagues) in the past 12 months?
Happiness Index	[Total income in the past 12 months (yuan / year)] In the past 12 months, including operating income, wage income, rental income, pension income, government subsidies or other people's economic support, gift money, etc., how much does your income add together?
	[Surrounding environment] How about the village / small surrounding environment where you live (whether there is noise pollution, garbage stacking, etc.)? which is: 1. Very good 2. Good 3

6.2 Data Clear

Similar to the individual level validation classification method, the selection of the principal component analysis, the results as shown in the table and figure, because Factor3 contains only a variable, and according to the gravel changes in the steeper factor selection

number is 2, so only need to delete the money on the table, you can get the final factor contains variables.

Table 15

Variable	Factor1	Factor2	Factor3	Uniqueness
Community neighborhood relationship	0.8853	0.0015	-0.0116	0.2161
Neighbor help	0.8883	-0.0058	0.0006	0.2110
The preferred loan object	0.5095	0.0307	0.0931	0.7308
Feeling for the community	0.8895	0.0103	-0.0128	0.2085
Monthly post and telecommunications fees	-0.0029	0.6432	-0.1588	0.5611
Give financial help to others	0.0019	0.4341	0.2798	0.7333
Social donation expenditure	-0.0042	0.5929	0.2322	0.5945
Human gift expenditure	0.0221	0.6191	-0.1438	0.5955
The money other people give	-0.0097	-0.0258	0.9084	0.1740

Figure 2
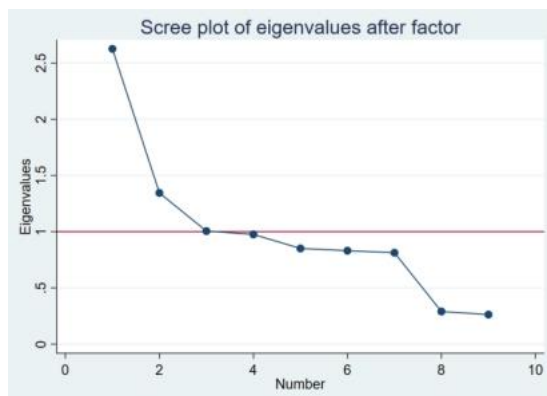
Similarly, the variables were standardized after linear fitting and standardized again to obtain three key variables: social network and social support and family well-being. There are a total of 10787 observed values in the sample. From the table, the correlation between each variable is weak and the extreme difference is small, so we can measure social capital more accurately. The regression results show that,

Table 16

	number	average	standard deviation	minimum	median	maximum
Social network	10787	-0.000	1.000	-1.655	-0.110	5.100
social support	10787	-0.000	1.000	-0.809	-0.239	31.234
Family happiness	10787	-0.000	1.000	-1.560	0.036	30.163

Table 17

	Social network	social support	Family happiness
Social network	1.000		
social support	-0.025	1.000	
Family happiness	0.201	0.209	1.000

Social network coefficient of 0.2059, said the social network each increase a unit, "family happiness" may increase 0.2059 units, because social network can provide information, resources and support, so as to improve the happiness of the family social support: coefficient of 0.2140, can be understood as social support can help families cope with stress and challenges, improve the family adaptation ability, security and happiness.

Table 18

	Family happiness
Social network	0.2059^{***}
	(22.3591)
social support	0.2140^{***}
	(23.2418)
_cons	-0.0000
	(-0.0000)
N	10787
adj. R^2	0.086

t statistics in parentheses

$^{*} p < 0.1$, $^{**} p < 0.05$, $^{***} p < 0.01$

6. Discussion

7. Conclusion and Policy recommodations

Through different dimensions of social capital on life satisfaction, concluded as follows: one is a large number of sample data OLS regression analysis found that social belonging, social trust, social interaction for life satisfaction has a significant impact on punishment effect, social sense of belonging on life satisfaction, social trust and social interaction can promote the improvement of life satisfaction, and through the robustness test. Second, the impact of social interaction in urban areas is not significant, while the influence of social belonging is not significant in rural areas, indicating that the rural complex is weakened, the

mobile media social and real social overlap is low, and the constraints are smaller in rural areas, and people are more dependent on families rather than modern organizations; third, the impact of social interaction in areas with low population density, the economy in these areas is often underdeveloped, and the traffic is weak; fourth, from the perspective of family economic satisfaction, social network and social support have a significant positive impact on the living standard. Therefore, according to the current population distribution and mobility characteristics and people's life happiness, several policy suggestions are put forward.

7.1 Unite the new-quality productive forces and develop a new type of urbanization

New quality productive forces have been spawned by revolutionary technological breakthroughs, innovative allocation of factors of production, and deep transformation and upgrading of industries. They are characterized by innovation, the key in high quality, and advanced productive forces in essence. People are the decisive factor in the relations of production. According to the economic growth model of Solo and Sargent, labor force and capital factors directly determine the economic output. The education and skill level of labor force can improve human capital, thus improving production efficiency and promoting economic growth. Therefore, under the new system of new quality productivity, cannot improve the residents 'comparative advantage, enhance residents' social ownership, social trust, social interaction to participate in the socialization of production, improve the economic efficiency and quality of life, the development of urban economy, urban and rural integration, let urban affinity rural, rural urbanization, improve the attraction and competitiveness of the city, this is the population reduction through social capital intensity to improve the economic efficiency and people's life satisfaction.

7.2 Grassroots organizations should move from management to service

The two sessions in 2024 pointed out that there are deficiencies in the work of the government, and some cadres lack the spirit of responsibility. Therefore, we should improve the incentive and protection mechanism for cadres to encourage them to dare to think and act and not be afraid of making mistakes under limited rules. The implementation of grass-roots organizations is an important force in social governance, introducing a multi-subject dispute resolution pattern to maintain community stability, and providing community services in accordance with the residents' wishes. Due to the different interests of individuals at the grass-roots level, it is difficult to agree in practice, and cadres refuse to take responsibility because doing this will lead to bad consequences, making people "listen" rather than "opinions" to government organizations. At the same time, we should also enhance the consistency of macro policy orientation, avoid the implementation at the grass-roots level, and effectively implement the national social security policy and grass-roots distribution pattern, so as to better meet the needs of community residents and improve people's happiness and security.

7.3 Establish a friendly and clear social individual relations

Pro-friendly relationship is a social relationship based on mutual assistance, mutual trust and mutual understanding, which helps to reduce transaction costs, promote cooperation, and improve social efficiency and overall welfare level. Using modern communication tools, can be established based on block chain and big data technology information identification system, in the residents privacy situation, through the data depicting the trust of counterparties, promote through education to cultivate the mutual assistance, mutual trust and mutual spirit, and the government lead by example, not a set, do a set, reduce the degree of information asymmetry in the market, so as to improve the efficiency of the market. According to Ostrom's public choice theory, the friendly relationship between social capital can reduce the information asymmetry and agency cost in the government decision-making process, so as to improve the overall decision-making efficiency of the government and the overall welfare level of the society.

7.4 Continuous improvement of the infrastructure and home environment

Infrastructure construction and maintenance is a form of public goods, public goods with non-competitive and non-exclusive, strengthen transportation infrastructure communication and interpersonal relations and social relations, government subsidies to help improve the residential ecological and cultural environment, enhance residents express will, effective allocation of resources, promote social support and social network, and meet the demand of maslow hierarchy theory of social, respect and self-realization high-level demand, improve life happiness.

7.5 The pursuit of social development and people's identity synchronization

The social layout track should be consistent with the people's orientation. The goal of social development is not only economic growth, but more importantly, the recognition of the people. Only when people identify with the development direction of the society, their position and role in the society, and the social environment and humanistic relations they live in, their happiness in life will be improved. This sense of identity can be realized through fair opportunity distribution, just social governance and inclusive social policies. Economic growth can bring to the improvement of material life, but if the development direction of society, policy and resource allocation can't get widely recognized by the people, it also requires fully considering the interests of different groups and demand, establish and perfect the social security system, provide public services, safeguard people's basic life, as far as possible to achieve fair distribution and the results of fair distribution. In addition, when people face living difficulties, they can get social help and support, so as to enhance their sense of social identity. This is in the pursuit of social development process, we must pay attention to and strive to achieve the goal.

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