

Spatial Heterogeneity and Neighborhood Social Capital

Abstract: This paper analyzes heterogeneity of community space, which concludes the heterogeneity within communities and between communities, and their effect for neighborhood social capital. Our analysis is that the two kinds of heterogeneity coexist at the same time in the Chinese cities, even in the same city. The national community stratification does not obvious, except economically developed cities such as Shanghai, Beijing and others. The coexistence of spatial heterogeneity will undermine neighborhood social capital, but the data respects slightly higher social capital than our life experience, which makes us pay more attention to the level of development difference between cities, as well as the explanation on how policy-oriented urban development affect neighborhood social capital.

After the founding of New China, the development of the neighborhood space experienced three stages: the prosperity, atrophy and fragmentation. During the period of Great Leap Forward, community neighborhoods played an important role, during the danwei system, residents had a stronger sense of belonging for danwei than community.^① The residents' danwei characteristics disappeared, when the danwei system gradually disintegrated, this problem obviously be reflected in the period of community construction. Currently, with high heterogeneity and fluidity of community organizations and members,^② less neighborhood contact, lack of residents' sense of community,^③ low rate of community participation, such a condition of low neighborhood social capital is a consensus in the community study.

There are many research papers on community social capital. From the disciplines point of view, in addition to the concern of social sciences, urban planning and human geography disciplines also care about how to improve neighborhood communication from space design. There are two main questions to research neighborhood communication. First question is the analysis of reasons for the low neighborhood social capital. The second question is how to improve neighborhood communication, and to increase community social capital, namely tries to find methods to improve neighborhood communication.

Urban planning and human geography research services for the second question. Their study have a consistent starting point that is the lack of communication within the community has some connection with the space planning, they consider the rational distribution of space and design can improve the residents' contact. Such studies are more concerned about the perceived hierarchy of physical space systems and perceptibility of spatial scale in residential community.^④ Whichever to pursue the idea of "social reform" garden city design philosophy and practice,^⑤ or to emphasize

^①Huang Rongying, A theory of interpretation on the lack of our country city community involvement, Seeker No.3(2010).

^②Ma Hongwei, Gui Yong, Community construction in the city neighborhood: rehabilitation or reconstruction, Journal of Fujian Party School, No.6(2007).

^③Zhao Hengyu, Hu Xiaoming, Urban Residential District Space Based on Reorganization of Neighborhood Social Resources, Architectural Journal, No.8(2009).

^④Wang Hua, Analysis of residential community in the "neighborhood" and "space", Architectural Knowledge, No.3(2004). Xue Fengfeng, Research on city community neighborhood, Architectural Journal, No.4(2004). Zhao Hengyu, Sun Yan, Neighborhood Communication and Community Vitality form Angle of Medium, Huazhong Architecture, No.6(2009).

^⑤Dai Feng, Huang Chongming, The community planning Thoery of the urbanization process, Commercial Times, No.31(2010).

"neighborhood unit" design ideas of separation between people and vehicles,^① education facilities first, environmental safety, or with strong influence, or emphasize the humanistic ideas of "new Urbanism" design philosophy.^② The subsequent residential planning concept is from the view of design and planning, prior to pave the way for community contacts.

However, the existing studies have found that the design of physical space provided a place for neighborhood sociability, and created the possibility for the neighborhood association, but the physical environment had indirect impact on it, often worked through a number of intermediate variables,^③ even it did not work. For the neighborhood communication, physical environment is not the crucial influence factor, which forces us change perspective of neighborhood interaction from a physical space planning to the attention of the community itself. That means the lukewarm of neighborhood exchanges has other influencing factor.

1. Community heterogeneity and neighborhood communication

Indifferent neighborhood does not from everlasting, and is not a common failing in all communities, but it is a difficult miscellaneous disease in the modern community construction.

1.1. The negative function of heterogeneity within community for social capital

We emphasize the importance of social factors on community social capital. If we shelve the individual-level factors, such as income, education, occupation and others, the community-level variables become more and more important in the analysis of the neighborhood communication. Community environment here is not just referring to the physical environment of the community, and also refers to the social environment of the community, for example, groups of residents within or between the community homogeneity.

The current researches on negative effects of community heterogeneity to community exchanges or activities participation have three analysis dimensions, which are community internal racial heterogeneity, income heterogeneity and ethnic heterogeneity. They found higher community heterogeneity lead to lower social capital.^④ In the ethnic heterogeneity community, there also exist problem of income inequality, the residents who have low trust to others or low participation in the community of ethnic heterogeneity may generally oppose racial integration.^⑤ Compared to the heterogeneity communities, homogeneous communities have higher social capital.

1.2. The applicable problem of community heterogeneity index

① stratum heterogeneity index of community——horizontal heterogeneity

When our attention on social capital rise to the community level, we will find that the overlapping of community heterogeneity measurement, income inequality within the community may be manifested between different races. Do we have a reliable and comprehensive indicator to measure community heterogeneity? In addition, China is not the case of racial differences, in these communities, what will be the important influential factor for social capital? Is income

^①Tao Xiaobo, The trend and principle of modern community planning ,Economic Herald, No.6(2010).
LI Qiang, FROM THE NEIGHBOURHOOD UNIT TO THE COMMUNITY OF NEW URBANISM:RESEARCH ON THE EVOLUTION OF THE COMMUNITY PLANNING MODEL IN USA, World Architecture , No.7(2006).

^②By XU Yida, WU Mingwei, Two Words of Community Planning, Urban Planning Forum, No.4(2002).

^③ Emily Talen, "Sense of community and neighbourhood form: an assessment of the social doctrine of new urbanism," Urban Studies, Vol. 36, No. 8, (1999) ,pp.1361-1379.

^④ Alberto Alesina, Eliana La Ferrara, Who trusts others? Journal of Public Economics, 85 (2002) 207 –234.

^⑤ Alberto Alesina and Eliana La Ferrara, Participation in heterogeneous communities, The Quarterly Journal of Economics, Vol. 115, No. 3 (Aug., 2000), pp. 847-904.

heterogeneity?

Income heterogeneity has significant negative effect on the community social capital in the above documents, but this research result is widespread or has its applicable condition?

② organization heterogeneity index of community——longitudinal heterogeneity

In China, during the danwei system, community development has been seen as a period of atrophy. The production and living of people in the one and same danwei space, the neighborhoods are not a stranger, they are familiar with the professional community. Although internal danwei has income heterogeneity, but residents still have a strong sense of belonging to the danwei. It's difficult to distinguish the establishment of belonging is around occupational or the geopolitical or both two.

We suspect the analysis of community income heterogeneity. Regardless of the heterogeneity of the community, and its role in the play are a prerequisite.

No matter what kind of community heterogeneity, its efficacy for social capital has prerequisites, which may be a special historical period, or a particular type of community. However, in any case, we are not very sure that the interpretation of community income heterogeneity dominates itinerant entertainers, regardless of borders and the historical background.

The administrative performance of the danwei extended into personal life in danwei community. Neighborhoods perhaps have stronger social capital on account of benefit, or the characteristics of the times. With the times change and benefit division, this cohesion might be destroyed.

After the reform and opening up, the restructuring of state-owned enterprises, the development of the market economy, the booming of real estate market, and the fragmentation of urban space, the change has an effect on community development. Diverse residents live together. We must know that what is community difference like in the China's market reform period?

2. Heterogeneity between the community and neighborhood association

The shortcoming of the above studies is to highlight the impact of heterogeneity within the community on the social capital, but it ignores the role of heterogeneity between communities. The two aspects of community are different. If we see the city as a whole, community homogeneity may possibly produce isolation and expand heterogeneity among the community in a presence of a variety of inequality city. Higher heterogeneity between communities may divide city space into independent parts, and will be less conducive to the development and management of urban communities.

In China, there are several papers on the analysis of difference between communities. If we pay attention to this differences that means we actually care about differentiation of city space. Through residential space differentiation to explore the city spatial is a common method.

2.1. Heterogeneity between communities – take the space differentiation of Beijing and Shanghai for example

Housing differentiation in Beijing is affected by economic factor. If we put the houses sort from excellent to inferior, the appearance would be followed by the economic elite, senior white-collar, middle-income families, low-income families and rural migrant workers. Even the suburbs of Beijing are beginning to appear residential segregation that will be accelerated with the construction major roads. Construction of the highway is conducive for car owners to buy high-grade houses, while the building of metro rail is helpful for ordinary people to purchase

ordinary-grade houses. ^①Some of the aristocratic residential live nearby the main scenic spots and tourist resort. The rich may have an apartment in the urban areas, meanwhile they also may buy a higher quality houses, which can provide convenient transportation and away from the hustle and bustle to enjoy the pleasure of returning to nature.

In Shanghai, the highest-income earners generally live in the new luxury community of city center and villa area nearby urban fringes. Higher-income groups are mainly concentrated in new housing communities nearby the rail transportation routes, the ordinary working class mostly distributed in the allocation of public houses by danwei, low-income groups are mainly concentrated in the old town, rural migrant workers rent cheap private houses in the combination of urban and rural or the village in the city, and they inhabit according to the origin and occupation. ^② Due to the influence of living space layout in the planned economy era, the upscale community of advanced building in the center of Shanghai often adjacent to the low-grade community which were built earlier, and makes the obvious differences of urban ecological landscape. Such significant differences not only exist in Shanghai, but also exist in other large cities, such as Guangzhou.

2.2. A dispute on Chinese community stratification

We recognize that the phenomenon of Chinese urban spatial differentiation is evident according to the above analysis, and this differentiation based on economic factors. The income level affects living location seriously. Residential space segregation has brought several drawback, researchers suggest mixed settlement patterns to solve these problems. It's important to make different status and diverse groups live in the rational space and harmonious coexistence. ^③

Some researches think that the stratification trend of our city community exists, but it does not accomplish. ^④ And mixed residential will decline community social capital, it may go against community integration.

This paper adopts four dimensions to measure community structure^⑤: occupation, education, income, housing prices. Income and housing prices are always used to gauge heterogeneity, they represent the economic level and spatial location respectively. People with different work may have different value. People with different education degree are different in cultural background. The differences have an affect on residents association. In order to give more intuitive understanding of differences between communities and internal community, firstly, we analyze differentiation of national communities. Secondly, we selected community of Beijing, Tianjin and

^①Wang Hongwei, Suburbanization of Metropolis, differentiation patterns of the residential space—taking Beijing as an example. *Architectural Journal*, No.9(2003).

^②QIN Hong-ling, The Residential Stratification of the Rich and the Poor and Social Justice in Large Cities, *Modern Urban Research*, No.9(2006).

^③Qin Honglin, City habitation configuration: from spatial differentiation toward space integration, *Theory Horizon*, No.2(2010).

^④Duan Jiye, Community stratification: reality or feasibility, *Social Science Research*, No.4(2006). Xu Xiaojun, Shen Xinkun, Urban partition of the rich and the poor and the community stratification, *Journal of Huazhong Normal University(Humanities and Social Sciences)*, No.1(2008).

^⑤Multi-dimensional or single dimension can be used for the division of community social structure, also standard deviation, variance, interquartile range, median, mean, etc. can be used to judge the trend of discrete or centralized research, there are also studies with imbalance index, namely the income rank on percentile 50 middle-income divided by arithmetic average of the average personal income. The ratio is equal to 1 indicates the community has no income imbalance, the smaller the ratio, the more serious the community income imbalances, community residents within the greater the income difference (CHENG Li-Hui, WANG Xing-Zhong, Research on the Urban Social Income-Space in Xi'an, *Scientia Geographica Sinica*, No.1(2004).), Which way to determine spatial differentiation depends on the researchers' data characteristics and research issues.

Shanghai^① as a case to compare the differentiation in different dimensions.^②

2.3. The differentiation of national communities

Our data comes from the 2005 General Social Survey (CGSS),^③ which includes 28 provinces and municipalities. They took Multi-stage stratified sampling method, and 969 villages/urban communities had been extracted, 559 urban communities among others. Nearly 87 percent of the neighborhood committees have completed 10 or 11 residents' questionnaire, and ten percent communities finished 20-22 questionnaires. A neighborhood committee area represents one community. In 2005, it had collected 10372 samples in China, and the number of urban sample is 6098. The samples of Beijing, Tianjin, Shanghai, and Guangdong Province accounted for 26.05% of the total urban sample. About ninety percent of respondents' location is their permanent residence, and it indicates that the most respondents are local residents in the urban sample.

Table 1: differentiation of description statistics within community (community-level)

	The proportion of high education residents in each community (N=559)	The dispersion degree of occupation categories within community (N=559)	Standard deviation of family income level within community (N=559)	Standard deviation of housing price per square meter within community (N=532)	Standard deviation of socioeconomic status within community (N=559)
first 5%	0	0.3	3543.8	3512.1	1.8
1%-20%	0	0.47	5633.95	5503.6	3.8
20%-40%	0.005	0.65	9584.99	9327.9	7.1
40%-60%	0.1	0.74	13326.3	12751.7	8.7
60%-80%	0.2	0.82	21131.4	19159.3	10.0
80%-100%	0.4	0.94	69414.2	39612.6	12.0
last 5%	0.5	1	151817.6	62142.7	13.4

From table 1, only five percent communities have half residents of high education within community. Occupation categories vary greatly within the community, most residents work on different jobs. Compared to differences of income and house price level within community, the differences of house price level is larger than income differences. Comparison of the first and the last 5% community socioeconomic status differences in the level of the residents within the community, social economic status levels vary greatly. The first 5% and the last 5% residents' social economic status levels vary largely.

Table 2: differentiation of description statistics between communities (community-level)

	average education level	average household income levels of	average housing price per square	average socioeconomic

^①The places where city community sample of more than 30 include Beijing (40), Tianjin (40), Shanghai (40), Guangdong Province (33) and Shandong (32), on the division of administrative units, the first three places are cities, the last two are provinces, under the same conditions, we choose the top three sites as the case is more representative.

^②Owing to the space limitations, we omitted the graphics internal community by education level and household income differentiation. Those in need can be obtained from the author.

^③The data comes from the "Chinese General Social Survey (CGSS2005)" which received funding of the National Social Science Foundation of China.

	of community(N=59)	community(N=559)	meter of community (N=532)	status of community (N=559)
first 5%	5.6	5185.6	154.9	53.5
1%-20%	7.0	8284.7	350.7	55.2
20%-40%	8.8	14386.7	702.1	58.0
40%-60%	9.8	19352.2	1249.7	60.0
60%-80%	10.9	25660.8	2623.4	62.2
80%-100%	12.3	42777.1	6393.0	67.0
last 5%	13.4	59358.6	9494.6	70.8

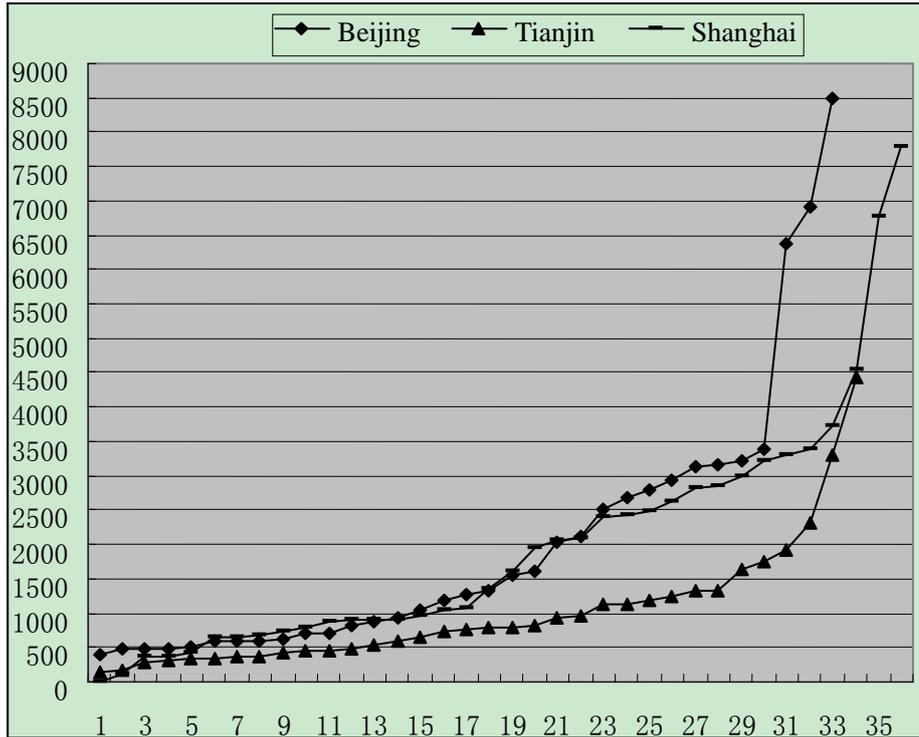
From Table 2, ① Residents' average education is seven year among the first twenty percent communities, it is very different compared with the after twenty percent community; ② The first twenty percent communities have the lowest average household income levels, which is less than ten thousand yuan per year. There is a big difference between the first five and the last five communities; ③ In the first five percent communities, the average price of per square meter is 154.9 yuan, and the gap is 61 times compared to the last five percent communities; ④ That also shows there is 12 points gap between the first and the last twenty percent communities in socio-economic status.

Our basic finding is that the differentiation is larger between communities and within the community. A few communities have obvious phenomenon of stratification, but most stratification of the communities is not prominent. The majority of the Chinese communities mainly based on mixed residential.

2.4. The differentiation within community and between communities in Beijing, Tianjin and Shanghai

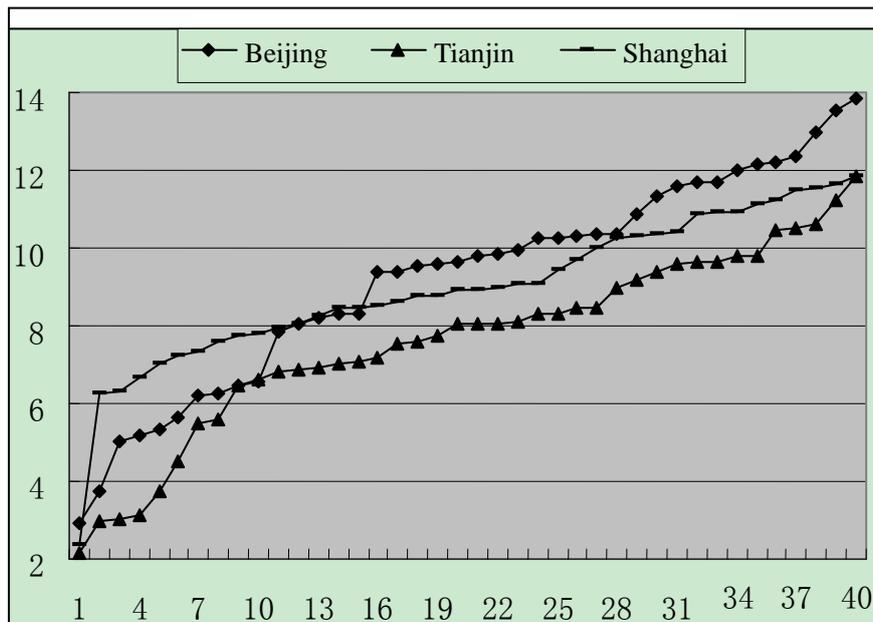
Figure 1 shows that three cities have larger difference of house prices within their community. Internal house prices vary widely in the several communities, especially in Beijing and Shanghai. The curve is steep, difference is bigger. And the urban housing inequality is more severe. Overall, the difference of community internal prices in Beijing is higher than in Shanghai and Tianjin, the difference in Tianjin is the smallest. However, compared to other communities across the country, this degree of internal differences is not very high if we binding standard deviation of housing price per square meter within community in table 1. The degree of internal community difference in three places is not very high.

Figure 1: community internal differentiation of three areas on housing prices in 2005



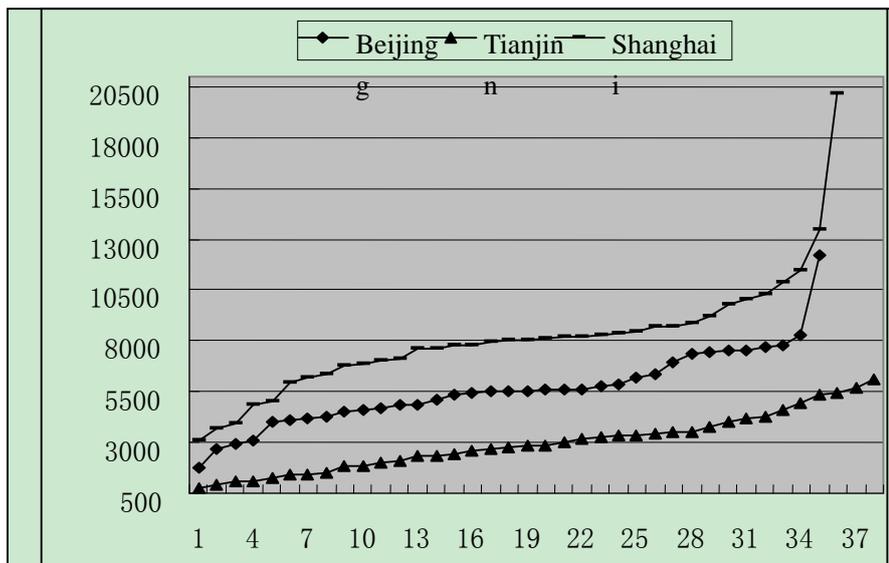
There has community differentiation of social-economic status between three areas. In Beijing and Tianjin, the internal differences of special communities are not great from Figure 2, but several communities' residents of internal social-economic status differentiation are very large. In Beijing and Shanghai, the degree of internal differences is larger than most of the countrywide communities if we binding standard deviation of socioeconomic status within community in table 1. Overall, residents' socioeconomic status differentiation in Beijing community is higher than in Shanghai and Tianjin community.

Figure 2: community internal differentiation of three areas on socio-economic status in 2005



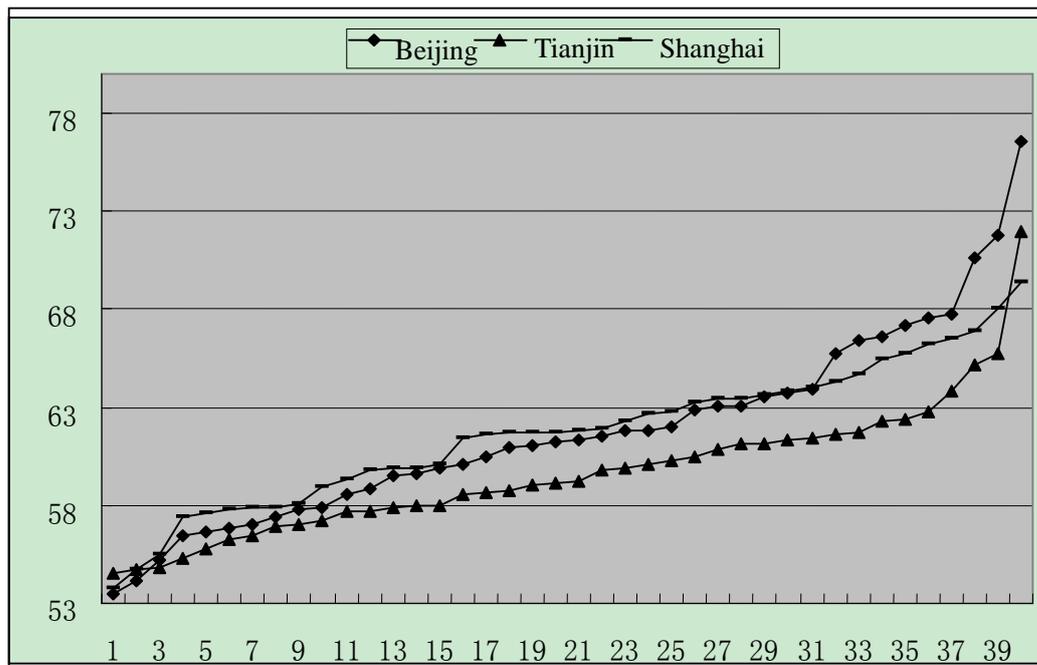
In order to compare the community differences of three cities, we use different latitude to compare intercommunal differentiation. Seen from Figure 3, the difference of community housing price in the same area is very large, but the largest prices differences of community is Shanghai, followed by Beijing, Tianjin is again. Most average price in Shanghai and Beijing are higher than the national majority of community if we binding average housing price per square meter of community in table 2.

Figure 3: Intercommunal differentiation of three areas on average housing price in 2005



The average socio-economic status level of community in Beijing and Shanghai is higher than in Tianjin communities. Nevertheless, there are large differences among the three regions.

Figure 4: Intercommunal differentiation of three areas on average socio-economic status in 2005



According to analysis of the housing difference between communities, the figure also

confirms that there is some degree of community segregation in Shanghai and Beijing. At the same time, the isolation within community also exists. Our conclusion is that stratification of the whole nation is not obviously, but it is extrusive in some cities.

Then, under the condition of coexistence between community heterogeneity and differentiation within the community, is this coexistence of spatial isolation weak neighborhood social capital?

3. Neighborhood social capital measurement

We need to distinguish the concept of social capital. Coleman and Bourdieu's concept of social capital concerned about the network embedded in the individual and the family relationships, as well as embedding network density and other characteristics. While Putnam treats social capital as public goods,^① social capital is attributed to the network, trust, rules. Our study uses Putnam's concept of social capital, and applied into community studies. The two kinds of social capital are different in nature, so the measurement is also different. Social capital studies in Japan are divided into two parts, some scholars try to measure social capital by the number of registered voluntary associations, another part of scholars measure social capital result in trust and other conceptual investigation.^② While the social capital we referred to has been put into community space, we think that most important elements of the community social capital are networks, trust and rules among neighborhood life.

The community social capital is mainly around three features of Putnam social capital concept, the following are construction index:

Table 3: Community social capital indicators^③

Problem encoding	indicator	Issues options
	trust	
qe14a	the general social interaction/contact without direct interest, how many (nearly) neighbors you can trust?	1 (most mistrust) -5 (most credible)
qe14b	the general social interaction/contact without direct interest, how many (town) neighbor/neighbor you can trust?	1 (most mistrust) -5 (most credible)
	network	
qf01	The degree of familiarity with neighbors, neighborhood/village other residents.	1 (very unfamiliar) - 5 (very well)
	norm	
qf02	In daily life, cooperation behavior with neighborhood	1 (no) - 5 (many)
Community social capital	The community trust adds network and norm	

The community social capital is individual level, it adds up by three dimensions of the measurement: trust, network and norm. If numerical value is greater that indicates more community social capital.

^① Alejandro Portes and Erik Vickstrom, Diversity, "Social Capital, and Cohesion," *The Annual Review of Sociology*, Vol. 37, (2011) ,pp 461-479.

^② Pepijn van Houwelingen, "Neighborhood associations and social capital in Japan," *Urban Affairs Review*, Vol. 48, No. 4, (2012) ,pp 467-497.

^③ The data of community social capital measurement comes from the "Chinese General Social Survey (CGSS2005)" project.

Figure 5: the community social capital

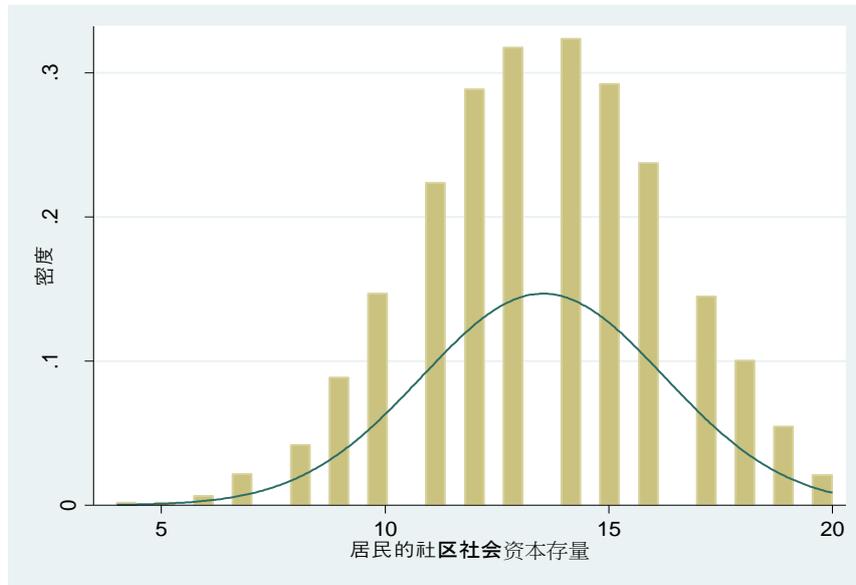


Figure 5 shows that the stock of community social capital is distributed normally. The minimum value is 4, the maximum value is 20, about 63% community social capital within in the interval [12,16], which means most trust, familiar, mutual aid of neighborhood is at an intermediate and slightly upper level.

The result of figure 5 is not inconsistent with argument about community social capital is low of the existing literature. It allows us to have two doubts. On the one hand, is there a particular phenomenon that a factor of social capital composition has high score? On the other hand, the problem of differentiation between communities and within community coexists, why neighborhood social capital also slightly higher? Should we seek answers from the Chinese history of community development?

Four, the influence of spatial heterogeneity to the neighborhood social capital (model omitted)

Five, the impact of extension study on neighborhood social capital (unfinished)

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