Social Capital across Residential Communities in China

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Abstract

Data from 2005 China General Social Survey show that the extent to which individuals are acquainted with, and trust, their neighbors, to which they are interested and involved in community affairs, and the frequency at which they exchange help with their neighbors, vary considerably across residential neighborhoods. Analysis shows that the variation is overwhelmingly due to differential social influences as opposed to different individual attributes. These social influences are found to be less positive in more affluent cities and in cities with greater income and education disparity within individual residential neighborhoods but appear unaffected by urban density. These findings highlight the need for policy attention to manage the potential decline in social capital with rising affluence and income inequality in Chinese cities at a time when social capital is much need for building new urban communities.

Keywords: People's Republic of China, Urban, Suburban, Public Policy, Development

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1. Introduction

Social capital, generally defined in terms of connectedness and trust among people, has been widely recognized as an important factor facilitating collective actions and economic development as well as promoting individual success and well-being (see, e.g., Glaeser, Laibson, and Sacerdote, 2002; Durlauf and Fafchamps, 2005; Helliwell and Wang, 2010); its rise and decline has been closely watched by scholars as well as policy makers in developed economies (Putnam, 2000; OECD, 2001; Costa and Kahn, 2003). The formation and consequences of social capital in the spatial context is of particular interest to urban economists. Proximity creates opportunities to connect and to be connected. At the same time, urban density would raise the returns to social capital by multiplying market and non-market interactions to be mediated by social capital. Yet our knowledge of how spatial environment influences social capital is quite limited (Glaeser, 1999), although it is being expanded by a growing number of studies. In the residential context, social capital has been examined in terms of its interaction with residential mobility (Glaeser and Redlick, 2008; Kan, 2007), its influence on citizenship and community governance (DiPasquale and Glaeser, 1999; Olken, 2006), and how it is affected by housing types, residential community changes and urban sprawl (Glaeser and Sacerdote, 2000; Hilber, 2010; Brueckner and Largey, 2008).

Few studies have examined social capital in the context of a developing economy. China experienced rapid urbanization over the past two decades: hundreds of millions of Chinese people moved from rural areas to cities and few urban neighborhoods have been left untouched by urban redevelopment. The urbanization process entails changes in both social and residential structures. How would these changes affect the individuals' connectedness and mutual trust in residential communities and their propensity to contribute to their community well-being via mutual help and engagement in community affairs? We have little empirical knowledge about these questions, despite the important role social capital can play in supporting community development in rapidly changing Chinese cities. Two decades ago, nearly all urban homes were state owned and managed; today, the vast majority of urban homes is privately owned and depends on private efforts and initiatives for community management and well-being. The social capital conditions across residential communities should be of concern to urban policy makers in China.

The present study is an attempt at documenting and analyzing the variation in social capital across residential communities in China. We employ the 2005 China General Social Survey (CGSS) as our primary data source. CGSS samples clusters of residents by residential communities in some 100 cities, whose political boundaries typically cover both rural and urban districts. A residential community is delineated by urban residential committee jurisdiction (called Ju wei hui in Chinese, which includes about a thousand households) or by rural village committee jurisdiction (chun wei hui). The data allow us to investigate four different indicators of social capital, namely, (i) how acquainted individuals are with their neighbors (ACQUAINT), (ii) how widely they trust their neighbors (TRUST), (iii) how often they exchange help with their

neighbors (HELP), and (iv) how much they involve themselves in the work and decisions of their residential or village committees (INVOLVE). Like those examined in the social capital literature, these social capital indicators, reported in CGSS based on individuals' self assessment, reflect both individuals' social network and their contribution to community well-being; these indicators, however, are more narrowly focused on social capital within residential communities.[1]

Social capital is both a private asset, contributing to individuals' economic and social success, and a public good, yielding positive externalities that promote social coherence and well-being. Research on social capital concerns both the choice by individuals to accumulate social capital (Glaeser, Laibson and Sacerdote, 2002) and the externalities manifested in enhanced economic exchange and public goods (Durlauf and Fafchamps, 2005). In examining the cross-community variation in social capital, we view the social capital primarily from the view point of community well-being. We focus on the cross-community variation with respect to the social influence on individuals' social capital indicators, which manifests as community fixed effects in the determination of the social capital indicators after accounting for individual attributes that may motivate individual social capital investment as suggested by Glaeser, Laibson and Sacerdote (2002). We find that, whereas the private motivations have notable effect on individuals' social capital indicators, the social influence appears to be considerably more important. The social influence can arise from several sources, including the endogenous effect, the contextual effect, the correlation effect, and the location effect.

The notion of endogenous and contextual effects is developed in the social interaction literature (e.g., Durlauf and Ioannides, 2010). The former reflects the mutual reinforcement of individual choices through social interactions within social groups (individuals' reaction to what their peers do), whereas the latter derives from the characteristics of the social group (individuals' reaction to who their peers are) that exert influences on individual choices. The correlation effect arises from unobserved individual heterogeneities correlated spatially due to residential location sorting. And the location effect is due to location heterogeneities, such as social institutions, public space, and residential density that may affect the cost of social interactions and social capital investment. The endogenous effect is closely linked to the notion of social multiplier (Glaeser, Sacerdote and Scheinkman, 2003): any shift in individual choice (due to altered private incentives or location heterogeneities) is multiplied at the community level due to the endogenous effect.

The precise identification of these different sources of the social influence on social capital is econometrically challenging (e.g., Durlauf and Ioannides, 2010) and is beyond the scope of the present study. Given the limitation of the data available, we content ourselves with a reduced form analysis of the determinants of the social influence. Although we employ the theoretical framework of the social interaction literature to guide our empirical analysis, our primary objective is to learn the cross-section heterogeneity in social influence rather than to seek accurate separation of the different sources of social interactions. We find that the social influence at the residential community level is affected by several city attributes, notably climate,

[1] See Durlauf and Fafchamps (2005) for an extensive discussion on the measurement of social capital, which generally includes the size and types of social network, trust, and various socially desirable behaviors.

household income level, urban growth, and the disparity in education among the residents. In particular, the empirical results show that social capital tends to be lower in more affluent cities and in cities with greater disparity in household income and education within residential communities but, consistent with the findings in Brueckner and Largey (2008), it does not appear to be affected by urban density. To the extent that social capital contributes to community well-being, the findings of the present study highlight the need for public policies in China to manage the potential decline in social capital with rising affluence and income inequality within cities at a time when social capital is much need for community building amid rapid urbanization.

We present an empirical framework according to the social interaction literature in the next section, which is followed by the description of data in section 3. The empirical findings regarding the cross-community determinants of the social influence on social capital are reported in section 4. We conclude in section 5.

2. Private Motivation vs. Social Influence on Social Capital

We adopt a linear model of social interactions (see Durlauf and Ioannides, 2010) to describe the propensity of social capital choices by individuals, as indicated by *ACQUAINT*, *TRUST*, *HELP*, and *INVOLVE*. Let y_{ij} be the propensity of individual i in social group j:

$$y_{ij} = \alpha_0' + \alpha \mathbf{x}_i + \theta \mathbf{z}_j + \beta m_j + \tau_j + \mu_{ij}, \qquad (1)$$

where $\mathbf{x}_i$ is a vector of individual attributes influencing the individual motivation (see Glaeser, Laibson and Sacerdote, 2002), $\mathbf{z}_j$ is a vector of community attributes capturing contextual effects, m_j is the expected average choice or propensity y_{ij} in the social group, τ_j represents the location heterogeneity (in the case where social groups are delineated spatially) and μ_{ij} represents unobserved individual heterogeneities. For the purpose of the present study, we identify the social group with the residential community where individual i lives. Further, we assume μ_{ij} to have a mean μ_j, reflecting the possible correlation of unobserved individual heterogeneities within the community due to endogenous sorting, and a standard error σ_j; thus $\mu_{ij} = \mu_j + \varepsilon_{ij}$, where ε_{ij} has a zero expected value and a standard error σ_j within the community. The α coefficients determine the private effect due to individual attributes, whereas the β coefficient captures the endogenous effect. Substituting the expected value of y_{ij} at the community level for m_j in Equation (1), we obtain:

$$\begin{aligned} y_{ij} &= \frac{\alpha_0'}{1-\beta} + \alpha \mathbf{x}_i + \left[\frac{\beta}{1-\beta} \alpha \mathbf{x}_j + \frac{\theta}{1-\beta} \mathbf{z}_j + \frac{1}{1-\beta} (\tau_j + \mu_j) \right] + \varepsilon_{ij}, \qquad (2) \\ &\equiv \alpha_0 + \alpha \mathbf{x}_i + \gamma_j + \varepsilon_{ij} \end{aligned}$$

where the terms within the square brackets represent different sources of the social influence on y_{ij}: the endogenous effect, the contextual effects, the location effect, and the correlation effect, respectively.

Our empirical analysis proceeds in two steps. In the first step, we estimate Equation (2), identifying the terms in the square brackets as the community fixed effects γ_j. Since the social capital indicators we examine are reported in discrete ranking, which is not necessarily linear and is potentially subject to censoring due to the survey instrument, we estimate Equation (2) using an ordered-probit model. Let Y_{ij} be the ranking of a social capital indicator reported by the individual at discrete values of 0, 1, …, H, with H being the highest reported level for the indicator. The ordered-probit model estimates the equation for the latent propensity y_{ij} specified by Equation (2) according to the following relationship:

$$\begin{aligned} &Y_{ij} = 0 \quad \text{if} \quad -\infty = s_0 < y_{ij} \le s_1 \\ &Y_{ij} = 1 \quad \text{if} \quad s_1 < y_{ij} \le s_2 \\ &\ldots \\ &Y_{ij} = H \quad \text{if} \quad s_H < y_{ij} \le s_{H+1} = \infty \end{aligned} \tag{3}$$

where s_h, h=1, …, H, are threshold values to be jointly estimated with Equation (2). Note that the latent propensity y_{ij} is linear and not censored. The ordered-probit model assumes ε_{ij} to follow Normal distribution with mean zero and variance σ^2; hence the probability of observing $Y_{ij} = h$, $0 \le h \le H$, is given by

$$\Phi\left(\frac{s_{h+1} - \alpha_0 - \alpha \mathbf{x}_i - \gamma_j}{\sigma}\right) - \Phi\left(\frac{s_h - \alpha_0 - \alpha \mathbf{x}_i - \gamma_j}{\sigma}\right),$$

where Φ is the standard Normal distribution function.

In the second step, we regress the estimated community fixed effect γ_j on the estimated individual effect $\hat{\alpha}\mathbf{x}_j$ and the contextual and location variables:

$$\gamma_j = \frac{\beta}{1-\beta}\hat{\alpha}\mathbf{x}_j + \frac{\theta}{1-\beta}\mathbf{z}_j + \frac{1}{1-\beta}\tau_j + \frac{1}{1-\beta}\mu_j \quad , \tag{4}$$

where μ_j is the residual, assumed to have a zero-mean Normal distribution across communities. The coefficient of the individual effect $\hat{\alpha}\mathbf{x}_j$ captures the endogenous effect. The potential correlation between the unobserved individual heterogeneities captured by μ_j, on the one hand, and the community attributes $\mathbf{z}_j$ and location heterogeneity τ_j, on the other hand, arising from possible endogenous sorting of residents across communities, poses econometric challenge for identifying the direct contextual and locations effects on individual social capital choices. The estimates of Equation (4), therefore, may potentially reflect the social influence on social capital choices via the influences of the community and location attributes on residential sorting with respect to the unobserved individual heterogeneity. The latter influences, however, are unlikely substantial given that the residential communities in China are generally highly mixed with respect to many observed individual attributes, as described in the next section.

3. Data and the Variable Description

Our primary data source is the 2005 China General Social Survey (CGSS2005), which surveyed 10,372 households in some 100 cities across 29 provinces via tiered sampling: cities within each province are sampled first, then residential communities (*Juweihui* in urban areas and *Cunweihui* in rural areas) are sampled, and finally around 10 households are sampled in each selected residential community.[2] We drop the observations that are indicated as unreliable by the survey interviewers according to their judgment of the reliability of the data and a small number of observations not in one of the five residential community types described below; some 9,400 observations are available for analysis. The appendix provides a description of all the variables used in the present study.

Table 1. Sample Statistics for Social Capital Indicators and Selected Individual Attributes

Community types	Old Downtown	Working Unit	Commodity Housing	Rural Town or Urban Village	Rural Village
No. of observations	987	2405	1176	813	3981
Community-type mean					
ACQUAINT	2.653	2.486	2.222	2.601	3.291
TRUST	2.932	2.931	2.734	2.984	3.264
HELP	1.811	1.715	1.491	1.846	2.500
INVOLVE	1.650	1.603	1.589	1.708	2.105
Income	26,014	26,677	31,448	26,963	9,761
Schooling	11.2	12.5	12.9	11.0	7.55
Homeownership_rate	0.631	0.807	0.764	0.809	0.982
Hukou_rate	0.857	0.937	0.888	0.905	0.984
Party_member	0.092	0.167	0.133	0.132	0.068
Age	45	46	44	43	45
Married	0.780	0.804	0.792	0.861	0.899
Full_time_job	0.342	0.402	0.426	0.401	0.043
Mean within-community standard deviation					
ACQUAINT	0.918	0.875	0.920	0.878	0.791
TRUST	0.843	0.863	0.871	0.798	0.777
HELP	1.032	0.992	0.995	0.968	0.964
INVOLVE	0.951	0.948	0.956	0.908	0.986
Income	28,762	26,365	33,047	34,468	14,181
Schooling	4.301	4.422	4.302	4.338	4.280
Cross-community standard deviation					
ACQUAINT	0.316	0.327	0.297	0.370	0.300
TRUST	0.288	0.210	0.228	0.257	0.258
HELP	0.338	0.365	0.374	0.345	0.398

[2] The sample size at the residential community level is similar to the size of neighborhood clustered sub-sample of the American Housing Survey (see Ioannides and Zabel, 2008). See documentation of CGSS at http://www.cssod.org/.

INVOLVE	0.256	0.265	0.252	0.297	0.343
Income	13,059	9,274	11,709	10,554	7,351
Schooling	1.737	1.591	1.932	1.637	1.517
Homeownership_rate	0.175	0.110	0.150	0.130	0.052
Hukou_rate	0.274	0.076	0.187	0.141	0.059

Table 1 shows the sample statistics of the social capital indicators and selected individual attributes reported in 2005 CGSS. For a quick look at the heterogeneity across residential communities, these statistics are computed by five main types of residential communities identified in 2005 CGSS, namely Old Downtown communities, Work Unit communities, Commodity Housing communities, Rural Town or Urban Village communities, and Rural Village communities. These community types are classified according to the overall characteristics of the community and the land-use planning as observed by the CGSS survey team.[3] Old Downtown communities have long histories and their residents are of more diverse background. Work Unit communities were developed during the planned economy between 1950s and 1980s and the household heads there generally work in the same (public sector) work unit or industry sector. Commodity Housing communities mostly were developed after 1980s, where homes were sold at market prices. Towns and urban villages are found in urban peripheral. Urban villages are former rural villages now enclosed by urban areas but remain outside of formal urban planning; they are important sources of informal housing in cities catering to migrant workers. Rural communities are governed by village committees, as opposed to residential committees in the urban area; rural residents collectively own the land through village committees.

One of the notable institutional features in China that may affect residential social interaction is Hukou. A Hukou is like an internal visa authorizing people to live and work in particular places. Although restrictions on labor mobility have been largely removed since early 1990s, access to social security benefits and to various local public services (e.g. education and healthcare) is still regulated by Hukou. Individuals' place of Hukou registration generally follows their parents'. Large cities in China often impose stringent requirements, in terms of obtaining formal long-term employment contracts in the city, for granting Hukou to workers whose original Hukou is not in the city. Large numbers of migrant workers work in Chinese cities without a Hukou in the city and are not expected to remain in the city for the long term.[4]

The top part of Table 1 reports the mean values by community types. Overall, the mean values for *TRUST* and *ACQUAINT* are higher than those of *HELP* and *INVOLVE*; people more often know and trust their neighbors than exchange help with them and involve themselves in the community affairs. These values also vary notably across community types: the social capital

[3] A small number of *Juweihui* communities are classified not as one these five main types, including luxury villa communities and unclassified.

[4] Hukou system was originally introduced in the 1950s to regulate population mobility, especially from rural to urban areas, to support state subsidized industrialization. Although rural workers are now free to move to work in cities, they are usually denied Hukou in the hosting city and consequently denied social security benefits and various public services in the city. See, *e.g.*, Financial Times report "Beijing Edges Towards Residence Reform" (March 5, 2010, available online at http://www.ftchinese.com/story/001031584/en) and The Economist report "Migration in China: Invisible and heavy shackles" (The Economist, May 6, 2010, print edition).

indicators are generally low in the relatively new urban Commodity Housing communities and highest in rural communities.[5] Residents in Commodity Housing communities generally know fewer neighbors, find fewer of them trustworthy, have fewer occasions to give and receive help, and less often concern themselves with the community affairs; they, however, are among the richest and most educated. Old Downtown communities feature low homeownership rate, low share of residents with Hukou, and low household income. Work Unit communities have highest proportion of residents with Hukou and Communist Party membership, whereas urban villages have least educated residents among the urban communities.

The middle part of Table 1 looks at within community heterogeneity. The heterogeneity is generally higher with respect to *HELP* and *INVOLVE* than with respect to *TRUST* and *ACQUAINT*. The income and education disparities are on average lowest in Work Unit communities and highest in Town and Urban Village communities. The bottom part of Table 1 shows cross-community heterogeneity within individual community types. The cross-community variations in social capital and individual attributes in each community type, though important, are much smaller than within-community variations, indicating very limited residential sorting across communities.

We investigate the extent to which the cross-community variance in social capital can be accounted for by differences in community and city attributes. A number of community attributes can potentially make a difference to social capital within the community: the average social capital in the community due to individual characteristics $\alpha \mathbf{x}_j$, which can generate endogenous effect; the homeownership rate and the proportion of residents with Hukou can affect the individual commitment to community well-being and within-community disparity in income and education can affect social interactions, providing contextual effects. Unfortunately, the community attributes computed with CGSS data may not be sufficiently reliable given the small sample size. We supplement the community variables with city-specific attributes to provide further control for contextual and location effects. The city-level variables for Equation (4) are derived from three sources: the 2007 Urban Household Survey (UHS2007) provides information of average education and income difference within *juweihui* for the city; the *2004 Chinese Statistical Yearbook* provides data on household disposable income, population size and density, and green space in cities; the *China Meteorological Data Sharing Service System* provides climate data of the city in 2004. UHS2007 has bigger sample sizes for the cities surveyed than does CGSS and hence may provide more reliable measures of within-community disparity in education and household income in individual cities.[6] In addition, the urban climatic amenities and green space may affect the individual propensity for social interaction and are included in Equation (4) as location effects.

4. Determinants of Social Capital across Residential Communities

We first assess the importance of the individual attributes and social influence on individuals' social capital in residential communities. Table 2 reports the ordered-probit estimates of the

[5] Studies in US also find people outside big cities are more trusting (see e.g., Glaeser, 1999).

[6] UHS2007 samples over 1000 households per city on average, about 10 times the sample size for CGSS2005.

determinants of individual social capital propensity y_{ij} as described by Equation (2), where the social influence is identified as community fixed effects. Age, marriage, household income, education, homeownership, Hukou, and Communist Party membership, on the one hand, appear to have positive influences on individual social capital in residential neighborhood and their effects are generally significant. Among the social capital indicators, *TRUST* appears least affected by these individual attributes, whereas *INVOLVE* appears most affected. In particular, homeownership and Hukou motivate social capital investment by reducing expected residential mobility and raising the returns to social capital investment. Homeownership, in addition, gives homeowners a financial stake in community well-being (DiPasquale and Glaeser, 1999). Having a full-time job, on the other hand, raises the opportunity cost of time for social interactions in one's residential neighborhood and, hence, does not help building one's social capital, although the effect is insignificant. Although human capital is found complementary to social capital, education beyond high school seems to lower social capital investment, probably due to increased opportunity cost of time for those highly educated people. Note that the effects of these individual attributes reported in Table 2 are likely biased estimates of their influence on individual social capital, due to potential simultaneity. It is possible, for example, that individuals with higher social capital are more likely to get married, have a full-time job, become a Communist Party member, and own a home.

Table 2. Ordered-Probit Estimates of the Determinants of Social Capital Choice Propensities

Ordered discrete choice	*ACQUAINT*	*TRUST*	*HELP*	*INVOLVE*
ln(*Age*)	0.986***	0.411***	0.538***	0.960***
	(9.5)	(3.9)	(5.5)	(9.7)
ln(*Income*)	0.120***	0.009	0.123***	0.179***
	(2.9)	(0.22)	(3.1)	(4.5)
Married	0.043	0.036	0.148***	0.088**
	(1.2)	(0.97)	(4.2)	(2.5)
Full_time_job	-0.0555	0.007	-0.040	-0.001
	(1.6)	(0.20)	(1.2)	(0.04)
Party_member	0.078*	0.103**	0.104**	0.408***
	(1.8)	(2.4)	(2.6)	(10)
Homeowner	0.297***	0.162***	0.162***	0.117***
	(6.6)	(3.5)	(3.7)	(2.6)
Hukou	0.440***	0.0735	0.297***	0.116**
	(7.4)	(1.2)	(5.0)	(2.0)
Middle_sch	0.0793**	0.0269	0.127***	0.264***
	(2.4)	(0.82)	(4.1)	(8.6)
Tertiary_edu	-0.084**	-0.0139	-0.041	-0.051
	(2.2)	(0.35)	(1.1)	(1.3)
s_1	1.042**	-0.754*	0.393	2.340***
	(2.4)	(1.7)	(0.93)	(5.5)
s_2	2.140***	0.129	1.581***	3.482***
	(5.0)	(0.30)	(3.7)	(8.2)

s_3	3.336*** (7.7)	1.246*** (2.9)	2.670*** (6.3)	4.690*** (11)
s_4	4.804*** (11)	2.663*** (6.1)	3.922*** (9.3)	5.962*** (14)
Community fixed effects	Yes	Yes	Yes	Yes
Pseudo *R* squared	0.222	0.171	0.177	0.154
No. of observations	9395	9357	9395	9395

Note: the estimation equation is described by ordered-choice Equation (3), where the latent propensity y_{ij} is specified by Equation (2). *t*-statistics are in parentheses; ***, **, * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Overall, the individual attributes and the social influences explain about 20% of the variance of the social capital indicators, suggesting that these indicators are noisy. Given the subjective nature of these indicators and likely differences in the perception of individuals about their social interactions, it is perhaps not surprising that the variance of ε_{ij} in Equation (2) is large. Nevertheless, the estimates of the individual attributes shown in Table 2 appear sensible and generally consistent with the findings in the literature regarding individual motivations for social capital investment (e.g. Glaeser, Laibson, and Sacerdote, 2002). In addition, the estimates of the ordered choice threshold values s_h, h=1,..,4, are well behaved. Hence we believe these social capital indicators provide useful measures of the difference in social capital across individuals.

Table 3. Decomposition of the Variance of Social Capital Indicators

Social capital indicators (SCI)	*ACQUAINT*	*TRUST*	*HELP*	*INVOLVE*
Sum of squared (SS)				
SCI	9,043	7,425	11,807	10,428
Predicted SCI	2,008	1,270	2,090	1,606
Predicted propensity	17,665	12,094	8,496	6,932
Individual effect	596	109	293	656
Community fixed effects	16,934	12,365	8,138	7,008
% of SS of predicted propensity				
Predicted SCI	11%	10%	25%	23%
Individual effect	3%	1%	3%	9%
Community fixed effects	96%	102%	96%	101%

Note: SS is computed based on mean adjusted values. SS of predicted SCI is computed as the SS of SCI multiplied by the pseudo *R* squared reported in Table 2. The predicted propensity is $\alpha_0 + \alpha \mathbf{x}_i + \gamma_j$ in Equation (2), the individual effect is $\alpha \mathbf{x}_i$, and the community fixed effects is γ_j. These variables are computed according to the ordered-probit estimates reported in Table 2. The number of observations is 9357 for *TRUST* and 9395 for the other SCI.

Table 3 provides a decomposition of the variance of the social capital indicators based on the ordered-probit estimates. It is notable that the variances of the predicted propensities are much greater than those of predicted social capital indicators, the latter being less than 25% of the former. In addition, the social influence clearly plays a dominant role in explaining the difference

in social capital indicators between individuals; the individual effect accounts for just between 1% and 9% of the variance of the predicted social capital propensities.

Our main objective is to investigate the cross-community determinants of social influences on individual social capital within residential communities. We focus on urban communities, which are more diverse with respect to income, education, homeownership rate, and Hukou mix. Cities also vary in size and growth rate. These variations enable us to examine how individual social capital is influenced by residential community context and urban environment. We select communities in the major cities (with population above 500,000) covered by CGSS2005, which are more adequately sampled. We further exclude communities with less than 10 valid observations, where the community fixed effect estimated with the model reported in Table 2 may not provide a reliable measure of the social influence. The resulting sample for the cross-community analysis has 348 communities in 54 cities, representing 4 types of residential communities, namely Old Downtown, Work Unit, Commodity Housing and Town or Urban Villages.

Table 4. Sample Statistics for the Community Social Influence and Average Individual Effect Measures

Variables		Mean	Std. Dev.
Social influences as measured by community fixed effects γ_j	*SI_ACQUAINT*	0.833	1.119
	SI_TRUST	1.111	1.175
	SI_HELP	-0.096	0.883
	SI_INVOLVE	0.965	0.723
Community mean individual effect $\hat{\alpha}\mathbf{x}_j$	*PM_HELP*	1.989	0.108
	PM_INVOLVE	2.805	0.139
Correlation coefficients	*SI_TRUST*	*SI_HELP*	*SI_INVOLVE*
SI_ACQUAINT	0.321	0.640	0.306
SI_TRUST		0.291	0.142
SI_HELP			0.295

Note: The sample includes 348 residential communities in 54 cities with population greater than 500,000. The community fixed effects γ_j and the individual effects $\hat{\alpha}\mathbf{x}_j$ are estimated with the ordered-probit model reported in Table 2.

Table 4 shows the sample statistics of the social influence measures. According to the standard deviation statistics, the social influences on individuals' neighborhood social connectedness (*ACQUAINT* and *TRUST*) appear more variable across communities than those on individuals' contribution to neighborhood public good (*HELP* and *INVOLVE*). In addition, the social influences appear more important than the individual effects in explaining cross-community differences in community social capital; the standard deviation of the former is more than 5 times the latter, consistent with the variance decomposition results shown in Table 3. The lower part of Table 4 reports the positive correlation among the social influences on the different social capital indicators, suggesting that these social influences either interact with each other or share certain common sources.

Table 5. OLS Estimates of Cross-Community Determinants of Social Influences on Social Capital

Panel A

Dependent variable	*SI_ACQUAINT*	*SI_TRUST*	*SI_HELP*		*SI_INVOLVE*	
Mean individual effect ($\hat{\alpha}\mathbf{x}_j$)	-0.103 (0.26)	-0.367 (0.36)	-0.0434 (0.05)	-0.273 (0.44)	-0.384 (1.20)	0.0785 (0.25)
(*ACQUAINT*>mean) $\circ$ $\hat{\alpha}\mathbf{x}_j$				0.215*** (3.21)		0.0848 (1.60)
Work Unit Community	0.0599 (0.41)	0.253 (1.29)	0.0906 (0.60)	0.0209 (0.17)	-0.158 (1.43)	-0.196* (1.88)
Commodity Housing Community	-0.193 (1.36)	0.169 (0.78)	0.0245 (0.15)	0.0545 (0.40)	-0.248* (1.90)	-0.235* (1.86)
Towns and Urban Villages	0.405* (1.67)	0.393 (1.53)	0.335* (1.95)	0.0714 (0.53)	-0.0327 (0.23)	-0.143 (1.04)
Homeownership _rate	-0.209 (0.90)	-0.0368 (0.13)	-0.274 (1.20)	-0.122 (0.61)	-0.076 (0.44)	-0.070 (0.43)
Hukou_rate	-0.599 (1.33)	-0.167 (0.26)	-0.650 (1.35)	-0.362 (1.06)	-0.304 (1.03)	-0.256 (0.96)
SD_Income	0.674 (0.98)	0.540 (0.74)	0.057 (0.13)	-0.209 (0.68)	0.233 (0.63)	0.156 (0.44)
SD_Edu	0.0518 (0.94)	-0.0198 (0.36)	-0.004 (0.12)	-0.028 (1.05)	0.033 (1.21)	0.023 (0.89)
Temperature _index	4.673*** (3.65)	-0.615 (0.47)	4.297*** (3.98)	1.864** (2.17)	2.975*** (3.05)	1.935** (2.07)
Humidity >75%	-0.544** (2.30)	-0.500*** (3.14)	-0.582*** (3.54)	-0.263* (1.85)	0.104 (0.86)	0.247** (2.17)
ln(*Population*)	-0.059 (0.70)	-0.063 (-1.00)	-0.152** (2.55)	-0.097** (2.11)	0.102* (1.77)	0.114** (2.20)
Immigration	-0.007 (0.20)	-0.049 (-1.20)	0.0300 (1.14)	0.043** (2.05)	0.0471* (1.94)	0.049** (2.11)
ln(*Disp_income*)	-0.980*** (2.81)	0.012 (0.03)	-1.203*** (4.15)	-0.738*** (3.29)	-0.687** (2.57)	-0.531** (2.12)
Green_space	0.021 (1.35)	0.008 (0.86)	0.016* (1.71)	0.004 (0.54)	-0.008 (0.92)	-0.013 (1.56)
SI_TRUST				0.062** (2.33)		0.004 (0.12)
SI_ACQUAINT				0.317*** (4.65)		0.137** (2.37)

Constant	9.340*** (2.99)	1.604 (0.39)	11.39*** (4.32)	7.433*** (3.64)	7.745*** (3.18)	5.117** (2.23)
R-sq	0.143	0.045	0.239	0.541	0.108	0.191
adj. R-sq	0.106	0.004	0.206	0.517	0.069	0.148

Note: the number of observations is 340. *t*-statistics based on heteroskedasticity consistent coefficient covariance are in parentheses; ***, **, * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Panel B

	SI_ACQUAINT	*SI_TRUST*	*SI_HELP*		*SI_INVOLVE*	
Work Unit Community	-0.060 (0.40)	0.349* (1.69)	-0.054 (0.37)	-0.059 (0.50)	-0.230** (2.05)	-0.224** (2.08)
Commodity Housing Community	-0.295** (2.15)	0.273 (1.21)	-0.0705 (0.43)	0.027 (0.20)	-0.297** (2.28)	-0.245** (1.98)
Towns and Urban Villages	0.284 (1.21)	0.445 (1.58)	0.273 (1.49)	0.117 (0.79)	-0.028 (0.19)	-0.088 (0.63)
MSD_Income	-2.438* (1.75)	-4.031*** (3.07)	-0.0796 (0.09)	1.281* (1.70)	-0.132 (0.17)	0.391 (0.51)
MSD_Edu	-0.019 (0.05)	0.127 (0.36)	-0.651* (1.92)	-0.654** (2.41)	-0.159 (0.59)	-0.157 (0.61)
Temperature _index	6.680*** (4.51)	0.599 (0.48)	5.729*** (4.34)	2.923** (2.54)	3.790*** (3.40)	2.509** (2.25)
Humidity >75%	-0.529** (2.34)	-0.380*** (2.60)	-0.490*** (2.85)	-0.239 (1.52)	0.117 (0.91)	0.223* (1.78)
ln(*Population*)	-0.096 (1.28)	-0.0444 (0.74)	-0.172*** (3.21)	-0.128*** (3.13)	0.0681 (1.29)	0.087* (1.76)
Immigration	0.011 (0.27)	-0.055 (1.30)	0.052** (1.97)	0.052** (2.40)	0.0586** (2.35)	0.0574** (2.36)
ln(*Disp_income*)	-0.960*** (2.80)	0.286 (0.89)	-1.173*** (4.68)	-0.803*** (3.90)	-0.778*** (3.13)	-0.599** (2.49)
Green_space	0.015 (0.91)	0.005 (0.54)	0.012 (1.38)	0.005 (0.68)	-0.012 (1.48)	-0.0152* (1.88)
SI_TRUST				0.088*** (2.81)		0.015 (0.45)
SI_ACQUAINT				0.412*** (6.83)		0.190*** (4.01)
Constant	10.14*** (3.15)	0.267 (0.09)	12.02*** (5.15)	7.819*** (4.05)	8.097*** (3.51)	6.163*** (2.75)
R-sq	0.154	0.08	0.242	0.518	0.113	0.189
adj. R-sq	0.125	0.048	0.216	0.498	0.082	0.156

Note: the number of observations is 331. *t*-statistics based on heteroskedasticity consistent coefficient covariance are in parentheses; ***, **, * indicate statistical significance at 1%, 5%, and 10% level, respectively.

To investigate the cross-community determinants of social influences on social capital, we estimate Equation (4), employing the dependent variables derived from the community fixed effects estimated with the ordered probit model reported in Table 2. Table 5 reports the OLS estimates. There are four groups of explanatory variables in Panel A. First, the community average individual effect is included to capture potential endogenous effect of social interactions. The results suggest that the endogenous effect of social interactions is scarcely one of the sources of the social influence on social capital.

The second group include measures of community attributes based on CGSS data. The community-type fixed effects indicate some influence of community types not accounted by other measures of community and city attributes. In particular, compared with the Old Downtown communities, Towns and Urban Villages seem to have a somewhat more positive influence on social capital, especially with respect to social interactions through acquaintance and mutual help (*ACQUAINT* and *HELP*), whereas Work Unit and Commodity Housing communities have a somewhat negative influence, especially with respect to involvement in community affairs (*INVOLVE*). The other community attributes measured by the CGSS sample, including homeownership rate in the community, Hukou mix, and disparities in household income and in schooling in the community, do not seem to make a difference to the social influences.

In the third group of the determinants of social influence are city attributes. We use *Temperature Index*, computed as the annual average temperature divided by the annual temperature range, and *Humidity* to capture the climate amenities, which may affect the propensity of social interactions. Higher *Temperature Index* values are observed in southern and coastal cities, where annual average temperature is higher and the temperature range is lower. Cities with a relatively high *Temperature Index* and a humidity level below 75% offer comfortable climate and also appear to strongly encourage social capital in residential communities. Residents in large cities seem somewhat less connected within their neighborhood and significantly less likely to engage in mutual help; they, however, appear to be somewhat more involved in community affairs. Interestingly, people in cities receiving more immigrants (as a percentage of urban population) are more likely to engage in mutual help with their neighbors and are more concerned with community affairs.[7] Notably, social capital appear less important to people in affluent cities (with high average household disposable income), even though people in high-income households tend to be socially more active in residential communities. With respect to built environment, it is interesting to note that abundance of green space in a city does not promote social capital. Experiment with including urban population density in the regression shows that neither does density affect social capital.

We further investigate the extent to which residents' propensities to contribute to community well-being through mutual help and involvement in community affairs are explained by their acquaintance and trust with their neighbors. The fourth group of explanatory variables include the social influence measures for *ACQUAINT* and *TRUST* and apply to the equation for *SI_HELP* and *SI_INVOLVE*. Both *SI_ACQUAINT* and *SI_TRUST* are strongly positively correlated with the social influence on *HELP*, and *SI_ACQUAINT* is positively correlated with

[7] It is also possible that cities where people are more helpful attracts more immigrants.

the social influence on *INVOLVE*. But the level of acquaintance and trust in the community do not completely explain the community social influence on mutual help and community involvement. Holding constant the community social influence with respect to *ACQUAINT* and *TRUST* generally dos not affect the significance of other explanatory variables in the regression of *SI_HELP* and *SI_INVOLVE*, although the endogenous effect of social interactions (reflected by the impact of the community average individual effect on social influence) is somewhat more positive in communities with above average *SI_ACQUAIN*.

One possibility that the community attributes based on mean individual attributes in the second group do not appear to have significant effects on the social influence measures of social capital is that the small sample provided by CGSS is inadequate for reliably measuring the community characteristics.[8] In Panel B, we replace these community attributes with city-specific average community attributes derived from 2007 UHS. The results indicate that income and education disparities within communities (*MSD_Income* and *MSD_Edu*, respectively) have somewhat negative contribution to residential social capital. In particular, the income disparity appears to discourage trust and education disparity appears to discourage mutual help. Across the different social capital indicators, the social influence on *TRUST* seems least affected by the community and city attributes we are able to measure, and that on *INVOLVE* most affected. Overall, the observed community and city attributes explain a relatively small fraction of the differences in social influence on social capital across communities, suggesting community attributes other than income and education disparities may play important roles in promoting or dampening social capital in residential communities.

5. Conclusions

Glaeser, Laibson and Sacerdote (2002) find that variation with respect to individual social capital investment is quite large and often difficult to associate with geographic neighborhood effects. The present study shows that, although individuals' age, education, income, employment, and homeownership have appreciable effects on their social capital, the geographic neighborhood effects are much more important, at least for social capital within residential communities. Furthermore, we find community social influences on individual social capital to depend notably on climate amenities, urban affluence and size, and the disparities in income and education within communities. These findings highlight the need for policy attention to manage the potential decline in social capital with rising affluence and income inequality in Chinese cities at a time when social capital is much need for community building as Chinese cities undergo rapid changes. The findings also suggest the need for further theorization and empirical investigation of the influence of community and urban environment on social capital.

[8] To the extent the social influences are common for individuals in the same residential community, the relative small sample size may not be a serious deficiency for measuring the community social influences.

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Appendix

Description of Variables

Variable Name	Variable Description	Mean (stdev)
Individual variables from 2005 China General Social Survey (9,406 observations)		
TRUST	How widely the individual trusts his/her neighbors (self rated from 0 to 4): 0 = very few, … 4 = most neighbors	3.05 (0.89)
ACQUAINT	How acquainted the individual is with his/her neighbors (self rated from 0 to 4): 0 = very little, … 4 = very much.	2.82 (0.98)
HELP	How often the individual exchange help with his/her neighbors (self rated from 0 to 4): 0 = seldom, … 4 = very frequent.	2.04 (1.12)
INVOLVE	How much the individual involves himself/herself in the work and decisions of his/her residential or village committee (self rated from 0 to 4): 0 = very little, … 4 = very much.	1.83 (1.05)
Age	The individual's age.	44.6 (14.6)
Income	The individual's household annual income.	20,078 (36,793)
Married	Binary variable: 1 = the individual is married.	0.85 (0.36)
Full_time_job	Binary variable: 1 = the individual had a full-time non-farm job in the past 3 months	0.25 (0.43)
Party_member	Binary variable: 1 = the individual is a member of the Communist Party.	0.11 (0.31)
Hukou	Binary variable: 1 = the individual's Hukou is registered in the community.	0.94 (0.24)
Homeowner	Binary variable: 1 = the individual is a homeowner in the community.	0.86 (0.35)
Schooling	Individual's year of schooling	8.29 (4.76)
Middle_school+	Binary variable: 1 = the individual attained at least middle school education.	0.63 (0.48)
Tertiary_edu	Binary variable: 1 = the individual has tertiary education.	0.17 (0.38)
Community-level variables from 2005 China General Social Survey (348 observations of urban communities)		
Hukou_rate	Community mean value of *Hukou*	0.91 (0.16)
Ownership_rate	Community mean value of *Homeowner*	0.75 (0.27)
SD_Income	Within community standard deviation of log household income	0.65 (0.25)
SD_Edu	Within community standard deviation of individual schooling	3.90 (1.28)
Urban-level variables [number in the brackets indicates source] (49 to 54 city observations)		
Population	2004 population in the urban districts of the city (10 thousand) [1]	272.1 (290.3)
Immigration	2004 net immigration to the city (percentage of *Population*) [1]	1.52 (1.66)
Disp_income	2004 urban household disposable income (RMB Yuan) [2]	10,049 (3,799)
Green_space	Green space (percentage of urban area) [3]	35.61 (6.33)
Temperature	Annual mean temperature/ (temperature range) [4]	0.18 (0.06)

_index		
Humidity	Annual average humidity (%) [4]	68 (7.75)
MSD_Income	City average within-community (*Juweihui*) standard deviation of log household income [5]	0.57 (0.07)
MSD_Edu	City average within-community (*Juweihui*) standard deviation of the schooling of household head [5]	2.57 (0.23)

Note: Data sources are [1] China Urban Statistical Yearbook, [2] China Regional Economic Statistical Yearbook, [3] China Urban Construction Statistical Yearbook, [4] China Meteorological Data Sharing Service System, [5] Urban Household Survey, 2007.