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Does Internet Use Promote or Inhibit Social Capital? Empirical Evidence from the 2017 Chinese General Social Survey

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This study examines what types of Internet use are related to social capital in today's China, using data from the 2017 Chinese General Social Survey. It distinguishes the intensity (the time spent on the Internet) and five types (communication, publicity, entertainment, information, and business) of Internet use and investigates their relationships with two distinct types of social capital—network capital and participatory capital that stress interpersonal networks and participation in social organizations, respectively. The intensity of Internet use shows a curvilinear relationship with network capital but displays no relationship with participatory capital. On average, its positive relationship with network capital turns negative after the threshold of 18.6 hours per week. Internet use for communication, publicity, and business is positively related to network capital, and that for publicity and business is positively related to participatory capital. Using the Internet for information and entertainment shows no relationship with either network or participatory capital.

Keywords: *China, the Internet, social capital, Internet use, social survey*

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Introduction

Scholars have long been debating the impact of the Internet on social capital (Domahiti 2018; Kim, Wang, and Oh 2016; Liu, Ainsworth, and Baumeister 2016; Neves 2013; Neves and Fonseca 2015; Nowland, Necka, and Cacioppo 2018; Orben and Przybylski 2019; Primack et al. 2017; Shensa et al. 2020; Wellman et al. 2001). Social capital is a relational concept and generally refers to various benefits embedded in or derived from social relations (Adler and Kwon 2002; Carpiano and Moore 2020; Rykov, Koltsova, and Sinyavskaya 2020). It can be useful for both individuals and collectives. It provides individuals with essential instrumental and emotional resources and also represents a key indicator of healthy civil societies. There have been competing and even conflicting perspectives on the impact of the Internet on social capital. Pessimists claim that the Internet has a detrimental effect on social capital in a society (Adorjan and Ricciardelli 2021; Nie 2001; Orben and Przybylski 2019; Primack et al. 2017; Shensa et al. 2020; Turkle 2011; Twenge 2017), because it takes people away from their families, communities, and face-to-face communications. In contrast, optimists contend that the effect may actually be beneficial (Domahiti 2018; Hampton and Wellman 2018; Kim et al. 2016; Neves 2013; Neves and Fonseca 2015; Wellman et al. 2001), as the Internet offers novel and effective channels of communication that facilitate the maintenance and creation of social ties.

It may not be helpful to assess the impact of the Internet broadly, however. People use the Internet for different purposes and the Internet provides distinct types of services, including social activities such as emails, chatting, and other online communications, and asocial activities such as web surfing, online gaming, and watching online videos. Different Internet services may bring about differing impacts on social capital (Nowland et al. 2018). The inconclusive findings about the impact of the Internet may be partly due to the conflation of distinct uses. This study thus specifically distinguishes five major services of the Internet used by individuals, including communication, publicity, entertainment, information, and business.

The idea of social capital has been employed widely to conceptualize the importance of social relations. However, not all scholars have the same idea in mind when they discuss social capital (Adler and Kwon 2002; Carpiano and Moore 2020). There are two major components that constitute the

general concept of social capital. The first component is from the perspective of individuals and stresses the importance of social relations to the individual. This can be called "network capital" and refers to "relations with family members, friends, neighbors and workmates that significantly provide companionship, emotional aid, goods and services, information, and a sense of belonging" (Wellman et al. 2001, p. 437). The second component is from the perspective of collectives and highlights the importance of social relations to a collective. It can be termed "participatory capital" and defined as "involvement in politics and voluntary organizations that affords opportunities for people to bond, create joint accomplishments, and aggregate and articulate their demands and desires" (Wellman et al. 2001, p. 437).

The Internet has rapidly infiltrated the lives of Chinese citizens, but it remains an empirically open question with respect to how and which types of Internet use promotes or inhibits social capital in Chinese society. This study is an attempt to fill this lacuna. It both distinguishes the types of Internet use and the types of social capital and examines the nuanced connections between them. The data collected in the 2017 Chinese General Social Survey (CGSS) provide a rare opportunity for the investigation of this important question. To the best of the authors' knowledge, the 2017 CGSS is the latest available national survey that collected rich data on both Internet use and social capital in China.

Relationship between Internet Use and Network Capital

Network capital includes both strong ties, such as those with family members, relatives, and close friends, and weak ties, such as those with acquaintances. Strong and weak ties often bring about distinct benefits for individuals, identified as "bonding" and "bridging," respectively (Aksar et al. 2020; Hampton 2011; Putnam 2000). Strong ties are more homogenous and thus often lack diversity, but they are a key source of essential social and emotional support. Although strong ties make up only a small part of people's full social networks in terms of quantity, they are of great importance. They provide a broad range of "bonding" resources, including emotional aid, companionship, and help on a daily basis as well as during adverse events. In contrast, weak ties are usually acquaintances and show more diversity and heterogeneity. These ties can bridge heterogeneous groups and offer an individual access to more diversified resources, such as novel information not

available in tight-knit strong ties. "Bridging" resources originating from weak ties lead to wider opportunities for new information and greater open-mindedness.

The bonding aspect of social capital captures the intensity of one's social interactions, while the bridging aspect of social capital captures the diversity of one's social networks. Internet use may have differing effects on the "bonding" and "bridging" benefits of social ties. This literature generally suggests that the Internet may promote contact with weak ties of acquaintanceship but depress the development of strong ties (Orben and Przybylski 2019; Primack et al. 2017; Shensa et al. 2020). For instance, McPherson, Smith-Lovin, and Brashears (2006) indicate that the use of the Internet is one major reason for the decline in strong ties to core confidants. According to them, the Internet encourages social networks to expand outward, but it detracts from deeper connections with relatives and close friends in local spaces. The Internet extends geographically dispersed weak ties at the expense of more intensive localized ties. The Internet may have a de-personalizing effect as online communications lose important social cues and contexts, compared to richer face-to-face interactions. Online communications tend to create relatively shallow social relationships and thus depress the intensity of social interactions. Other scholars find that the use of the Internet is associated with a decline in face-to-face interactions and communication with family members (Olds and Schwartz 2010; Sigman 2009). Online time is found to replace time spent with friends and family and create greater social isolation (Nie 2001; Orben and Przybylski 2019; Primack et al. 2017; Shensa et al. 2020). Therefore, the existing literature seems to indicate that although the Internet may foster greater network diversity, it negatively affects network intensity.

Hypothesis 1-1: Internet use has a positive effect on network diversity and a negative effect on network intensity.

However, it is also likely that Internet use is beneficial for both network diversity and intensity. The Internet frees people from the constraints of geography and schedule. It gives rise to "networked individualism" (Rainie and Wellman 2012; Wellman 2001) that creates networked individuals who can develop social ties that are both localized and distant. Those who are interested in maintaining and expanding their strong and weak ties now have a powerful medium that is both convenient and efficient (Aksar et al. 2020; Hampton and Wellman 2018; Liu et al. 2016). These novel communication technologies have made our social relationships both more persistent and more pervasive (Hampton 2016). Many strong ties may face the risk of losing

strength due to key life course events such as moving, graduation, and marriage. The Internet helps sustain the intensity of interactions with much less cost. Additionally, the Internet provides rich information about "the interests, location, opinions, and activities embedded in the everyday life events of one's social ties" (Hampton 2016, p. 103). The higher level of awareness of others' background, opinions, and daily activities made possible by the Internet also help deepen one's familiarity with others. They allow people to find a large network and to effectively manage a variety of ties (Hogan and Quan-Haase 2010; Liu et al. 2016). Furthermore, interactions on the Internet do not necessarily replace face-to-face interactions. They may supplement face-to-face interactions with family members and close friends and fill communication gaps between face-to-face meetings (Kim et al. 2016; Wellman et al. 2001). It is possible that frequent interactions on the Internet promotes mutual understanding and thus actually result in more face-to-face meetings. Hence, Internet use may have positive effects on both network intensity and network diversity. The Internet provides tools that not only allow individuals to build and manage more diverse weak ties but also provide more opportunities to maintain intensive strong ties.

Hypothesis 1-2: Internet use has a positive effect on both network diversity and network intensity.

Given the contested effect of Internet use on network capital in the existing literature, we propose a set of competing hypotheses 1-1 and 1-2 and will test which perspective is more consistent with the reality in Chinese society today.

Relationship between Internet Use and Participatory Capital

While the first component of social capital focuses on interpersonal relations among individuals, the second component, participatory capital, stresses the utility of social networks for collective endeavors. Participatory capital, such as volunteering and participation in social activities, is essential for an active and healthy civil society. It also gives individuals a voice in public affairs and can promote generalized trust (Putnam 2000; Verba, Schlozman, and Brady 1995). Existing studies show competing perspectives on the effect of the Internet on participatory capital (de Zúñiga, Jung, and Valenzuela 2012; Lee 2020). On the one hand, the use of the Internet may create more participatory capital by helping people become more informed, find common interests, mobilize for associative activities more easily (Lee 2020; Yamamoto,

Nah, and Bae 2020). The Internet provides a public space for people with shared interests to find and communicate with each other, and helps overcome the limitations of distance and time (Kahne and Bowyer 2018; Lee 2020).

Hypothesis 2-1: Internet use has a positive effect on participatory capital.

On the other hand, Internet use is also found to contribute to a decline in civic engagement (Guriev, Melnikov, and Zhuravskaya 2021). It may also depress civic participation by fostering superficial relationships, giving rise to social media "addiction," and distracting people from collective activities and public affairs (Adorjan and Ricciardelli 2021; Turkle 2011). Furthermore, by facilitating global communication and involvement, Internet use reduces interest in the local community and its activities (Nie 2001; Nie, Hillygus, and Erbring 2002).

Hypothesis 2-2: Internet use has a negative effect on participatory capital.

Finally, there are also studies that hold a more neutral view on the effect of Internet use because the positive and negative effects cancel each other out. For example, some meta-data analyses do not establish that Internet use has any substantial impact on civil engagement (Boulianne 2009).

Hypothesis 2-3: Internet use has no significant effect on participatory capital.

Hence, the effect of Internet use on participatory capital is also contested in the existing literature. Empirical analysis is needed to adjudicate the competing hypotheses.

Contingent Effect of Internet Use on Social Capital

The relationship between Internet use and social capital may vary depending on the type of social capital. Moreover, factors such as the type of Internet use, intensity of Internet use, and user characteristics may also affect the specific links between Internet use and social capital. It is not the technology per se that affects individuals' social capital but is the specific ways in which individuals use the Internet that matter (Valenzuela, Park, and Kee 2009). The key to the impact of Internet use is what resources individuals choose to consume and what kinds of content they expose themselves to (Campante, Durante, and Andrea 2021). Scholars have noticed a variety of motivations underlying Internet use and come up with different classifications of use types.

Here we provide an overview of various classifications in the literature.

Norris and Jones (1998) identified four types of Internet use including research (using the Internet for e-mail and investigative purposes), consumption (shopping online and using the Internet as a financial and travel resource), expression (discussing views or expressing opinions via bulletin boards, newsgroups, and chat rooms), and partying (going online to play games and be entertained). Shah, Kwak, and Holbert (2001) broke down Internet use into four major types such as social recreation, product consumption, financial management, and information exchange. Howard, Rainie, and Jones (2001) and Quan-Haase and Wellman (2002) noticed that the Internet could be used for a wide variety of purposes, such as surfing for information, playing online games, and communication. Sum et al. (2008) found that the most common types of Internet use included communication, seeking information, commercial purposes, and entertainment. Brandtzaeg and Heim (2009) proposed 12 types of Internet use including seeking new relations, keeping in touch with friends and acquaintances, general socializing, accessing information, debating, free short messaging, time-killing, sharing and consuming content, unspecified fun, profile surfing, keeping in touch with family, and others. Whiting and Williams (2013) identified 10 types regarding why people use the Internet such as social interaction, information seeking, passing time, entertainment, relaxation, communicatory utility, convenience utility, expression of opinion, information sharing, and surveillance or seeking knowledge about others. Al-Menayes (2015) claimed that university students' motivations for using the Internet are entertainment, information seeking, personal utility, and convenience. In Phua, Jin, and Kim's classification (2017), people use the Internet to fulfill their social, leisure, and informational needs. In Krasnova et al. (2017)'s literature review, there are four fundamental types of Internet use including relationship building, self-enhancement, informational benefits, and entertainment seeking.

Building upon the common ground of the literature on the types of Internet use, we identify five major types of Interest use—communication, publicity, entertainment, information, and business. Scholars have recognized that the type of Internet use provides key insights into the relationship between the Internet and the production of social capital (Shah et al. 2001). The relationship between Internet use and the production of social capital hinges on the motives individuals bring to their use of the Internet. For example, Internet use for communication purposes is often seen as beneficial to social capital (Kim et al. 2016; Lee 2020; Quan-Haase and Wellman 2002; Wellman et al. 2001). Communication on the Internet is inexpensive and

convenient and can reach broader communities of shared interest. Internet use for entertainment and information may draw people away from real-world social interactions and also reduce interest in local communities and organizations (Nie 2001; Nie et al. 2002; Olds and Schwartz 2010; Sigman 2009). Publicity and business uses of the Internet have been growing more popular but empirical studies about their impact on social capital have not kept up. Overall, due to the scarcity of empirical research, it remains an open question with respect to the links between specific Internet use and social capital.

Data and Method

The data are from the 2017 Chinese General Social Survey (CGSS) conducted by the National Survey Research Center based in Renmin University of China. The primary objectives of the CGSS are to gather data on social trends regarding Chinese citizens and the Chinese society and to provide information on significant social issues of current or emerging interest. A specific topic is chosen for the CGSS conducted in a particular year. The 2017 CGSS included a module on Internet use which collected rich information on how Chinese citizens use the Internet. It marks the first time that nationally representative data on both Internet use and social capital have been made available in China, so the 2017 CGSS data provide a rare opportunity for us to explore this topic in the Chinese context.

The target population of the 2017 CGSS included all persons 18 years of age and older in all China's 31 provinces (including autonomous regions and municipalities), excluding residents of Hong Kong, Macau, and Taiwan. Three-stage probability sampling was strictly implemented in order to generate nationally representative data. A total of 12,582 respondents were sampled and, among them, a random sample of 3,828 respondents participated in the module on the use of the Internet. This sample was nationally representative of the Chinese population and constituted the Chinese data in the 2017 International Social Survey Programme (ISSP) on "Social Networks and Social Resources." The data on the 3,828 respondents are used in the following analyses.

Dependent Variables

Social capital is a broad concept and we distinguish its network capital and

participatory capital components. We further operationalize each component with several specific measures.

The network capital component of social capital is gauged through the intensity and diversity of individuals' social ties that correspond to "bonding" and "bridging" network capital, respectively. The intensity of social networks is measured by the survey question "How often do you have social activities with your friends (such as visiting each other's homes, going to movies together, having meals together, and enjoying recreational activities together)?" Responses are on a six-point scale ranging from never (1), once a year or less (2), several times a year (3), about once a month (4), several times a month (5), several times a week (6), and almost every day (7). Thus, a greater value in this variable represents more intensive interactions with social ties.

The diversity of social networks is captured by the diversity of occupations embedded in one's social networks. The 2017 CGSS asks the respondent a battery of 10 questions regarding whether they know anyone of these following occupations including (1) bus or truck driver, (2) senior manager in a company, (3) janitor or custodian, (4) hairdresser or barber, (5) human resource manager, (6) lawyer, (7) auto repair technician, (8) nurse, (9) policeperson, and (10) junior middle school teacher. The survey uses these 10 randomly selected occupations to gauge the diversity of one's social networks. It also reminds the respondent that by "knowing" it means that "you know their name and can get into touch with them." For each of the 10 questions, yes is coded as 1 and no as 0. We add up the responses to the 10 questions to create the overall network diversity measure. A larger score indicates a greater degree of diversity in one's social networks.

The participatory capital component of social capital is assessed through participation in three major types of social organizations surveyed in the 2017 CGSS. The survey asks the respondent three questions about how often in the past year they have participated in the following social organizations including (1) recreation, sports, or cultural organizations; (2) political parties or political organizations; (3) charitable or religious organizations. Answers to each question are on a five-point scale ranging from (1) never, (2) once in a year, (3) several times in a year, (4) once to three times per month, to (5) at least once per week. We create three variables, each on a five-point scale, for participation in the three types of social organizations. For each variable, a greater score indicates more frequent participation in particular social organizations.

Explanatory Variables

The main explanatory variable, Internet use, is measured through the intensity and the type of use. The intensity of Internet use is measured by the self-reported average number of hours spent on the Internet weekly. We realize that the effect of the intensity of Internet use is often not linear but curvilinear so we also include its quadratic term in the modeling.

The type of Internet use is measured by five typical uses of the Internet. The 2017 CGSS asks the respondent a set of five questions, i.e., "In the past year, how often did you use the Internet for the following purposes? (1) Communication (such as using email, QQ, WeChat, or Skype to communicate with others); (2) publicity (such as promoting oneself on public online platforms, expressing and sharing personal experiences and feelings online); (3) recreation and entertainment (such as listening to music, playing games, and watching videos online); (4) information (such as searching information and reading news online); (5) commerce and business (such as online transactions and shopping online)." Responses to each of the five questions are on a five-point scale including never (1), seldom (2), sometimes (3), often (4), and very frequently (5). Five variables are generated accordingly, each representing a particular type of Internet use. For each variable, a larger score indicates more frequent use of the Internet for that particular purpose.

We also consider conventional demographic and socioeconomic variables including gender, age, ethnicity, education, income, and marital status. Gender is a binary variable, with male coded as 1 and female as 0. Age is measured in years. The ethnicity variable distinguishes the majority Han and other minority ethnic groups, with Han coded as 1 and other ethnicities as 0. Education is measured by the highest degree received and is on a seven-point scale (i.e., 1 = no education, 2 = elementary school, 3 = junior high school, 4 = senior high school or equivalent, 5 = junior college, 6 = university, and 7 = postgraduate). Income is measured by the respondent's annual household income (in Chinese yuan) last year. Marital status is a set of dummy variables including single (never married), married (including cohabitation), divorced (including separated), and widowed, with single used as the reference category.

Table 1
Descriptive Statistics for Dependent and Explanatory Variables

Variables	Mean	Std. Dev.	Minimum	Maximum
Network intensity	3.972	1.869	1	7
Network diversity	3.710	3.028	0	10
Recreational organizations	1.656	1.200	1	5
Political organizations	1.295	.801	1	5
Religious organizations	1.253	.731	1	5
Internet use intensity	3.654	11.256	0	150
Internet use type				
Communication	3.673	1.097	1	5
Publicity	2.751	1.138	1	5
Entertainment	3.312	1.128	1	5
Information	3.523	1.094	1	5
Business	2.871	1.343	1	5
Gender (male)	.472	.500	0	1
Age	45.171	16.864	18	103
Ethnicity (Han)	.925	.264	0	1
Education	3.230	1.511	1	7
Income (in thousands)	78.025	153.767	0	9999
Marital status				
Single	.105	.306	0	1
Married	.767	.423	0	1
Divorced	.029	.169	0	1
Widowed	.099	.299	0	1

Table 1 presents the descriptive statistics of all the variables used in the analyses. On average, Chinese citizens spend about 3.7 hours on the Internet per week. In terms of types of Internet use, the most popular use is communication with others, followed by seeking information, entertainment, online transactions, and finally promoting publicity. Figure 1 shows the frequency distribution of Internet use.

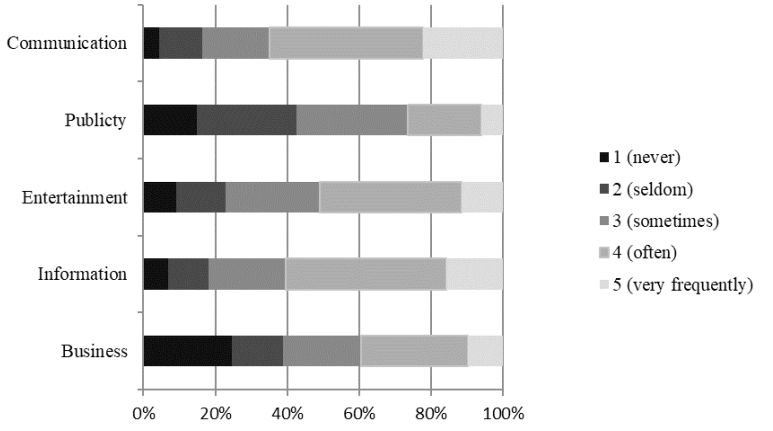

Fig. 1.—Types of Internet Use

Source: Chinese General Social Survey, 2017.

Methods

We employ the multilevel regression technique in the analyses. The data are structured hierarchically, with 3,828 individuals at Level 1 nested within 31 provinces at Level 2. The multilevel model allows the intercept to vary across provinces, thereby accounting for province-level heterogeneity. It also accommodates possible error dependence within provinces and corrects for the bias stemming from clustering when estimating the regression coefficients (Raudenbush and Bryk 2002). Additionally, it generates accurate standard errors and thus reliable tests of statistical significance. In addition to the random-intercept models, we also tried allowing the coefficients of the Internet use variables (intensity and types) to vary across provinces and estimated the random-slope models. The results are substantively the same.

We employ the "mixed" command in the Stata software (Release 16) (StataCorp 2019) to estimate the multilevel regression models. For each model we also report the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). When several models are applied to the same data, the one with a smaller value of the AIC or BIC shows a better model fit.

Results

First we estimate a battery of regression models to examine the effect of Internet use on network capital. The results are shown in Table 2. Models 1 and 2 present the results about network intensity, that is, the frequency of interactions with social ties. Model 1 only includes basic demographic and socioeconomic variables, while Model 2 further incorporates the Internet use variables. Judging from the AIC and BIC measures, including those Internet use variables does substantially improve the model fit, as Model 2's AIC and BIC scores are much smaller than Model 1's. The intensity of Internet use and its quadratic form both show significant effects, indicating that there is a significant curvilinear relationship between the time spent on the Internet and the frequency of offline social interactions. As one spends more time on the Internet, the frequency of social interactions first increases; however, as the time on the Internet increases further, the frequency of social interactions would eventually decline. The frequency of social interactions reaches its peak when the time on the Internet is approximately 18.6 hours, or 0.0052/(0.00014×2), per week. On average, if one spends more than 18.6 hours weekly on the Internet, additional Internet use would decrease their interactions with others in the real world. Some types of Internet use also show statistically significant and positive effects on interactions with social ties. Specifically, using the Internet for communication and business purposes is significantly and positively related to the frequency of social interactions. The other types such as publicity, entertainment, and information show no significant relationship with the intensity of social networks.

Table 2
Multilevel Regression Models of Network Capital

	Network Intensity		Network Diversity	
	Model 1	Model 2	Model 3	Model 4
Fixed effect:				
Intercept	4.403***	3.342***	2.348***	.146
	(.222)	(.274)	(.419)	(.508)
Gender (male)	.205**	.203**	.404**	.378**
	(.067)	(.068)	(.121)	(.122)
Age	-.011***	-.002	-.027***	-.002
	(.003)	(.003)	(.005)	(.006)

Ethnicity (Han)	.152	.145	.254	.197
	(.139)	(.141)	(.257)	(.257)
Education	.110***	.042	.551***	.392***
	(.028)	(.030)	(.051)	(.054)
Income (in thousands)	.0003	.0001	.002***	.002***
	(.0002)	(.0002)	(.0004)	(.0004)
Marital status (single as the reference category)				
Married	-.233	-.211	.906***	.911***
	(.112)	(.112)	(.202)	(.201)
Divorced	-.473*	-.464*	.955**	.918*
	(.200)	(.200)	(.361)	(.359)
Widowed	-.477	-.432	1.215**	1.214**
	(.254)	(.257)	(.459)	(.464)
Internet use intensity		.0052*		.003
		(.0023)		(.008)
Internet use intensity squared		-.00014*		.00002
		(.00003)		(.00008)
Internet use type				
Communication		.087*		-.081
		(.038)		(.069)
Publicity		.048		.148*
		(.036)		(.064)
Entertainment		.042		.131
		(.037)		(.067)
Information		.001		.026
		(.040)		(.072)
Business		.120**		.431***
		(.036)		(.065)
Random effect:	.040	.046	.397	.400
Intercept	(.020)	(.022)	(.135)	(.135)
LR test	12.22***	15.66***	67.73***	73.61***
Model statistics:				
AIC	8217.7	7938.3	10747.8	10386.2
BIC	8280.3	8034.7	10810.4	10482.6

Notes: (1) Numbers in parentheses are standard errors; (2) from 2-tailed tests, *P<.05; **P<.01; ***P<.001; (3) under "random effect," the LR test reports the likelihood ratio statistic for testing the null hypothesis that the random effect (between-province variance) is zero; a significant test result indicates that it is necessary to include random effects in the model.

Models 3 and 4 display the results about network diversity, that is, the diversity of people of different occupations in one's social networks. Comparing the AIC and BIC scores in Model 3 and Model 4, we can see that including the Internet use variables improves the model fit. The intensity of Internet use shows no significant effect, whereas using the Internet for publicity and business purposes are significantly and positively related to network diversity. The other types such as communication, entertainment, and information show no significant relationship.

In Table 3 we estimate six more models that assess the effect of Internet use on participatory capital. Models 5 and 6 examine participation in recreational, cultural, and sports organizations. Adding the Internet use variables does improve the model fit, according to the AIC and BIC scores. The intensity of Internet use has no significant effect but using the Internet for publicity and business purposes shows significantly positive effects.

Table 3
Multilevel Regression Models of Participatory Capital

	Recreational Org		Political Org		Religious Org	
	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Fixed effect:						
Intercept	1.198***	.631**	.333**	.244	1.134***	.904***
	(.179)	(.222)	(124)	(.155)	(.113)	(.141)
Gender (male)	-.040	-.005	.151***	.152***	-.047	-.044
	(.054)	(.055)	(.037)	(.038)	(.034)	(.035)
Age	.006*	.012***	.008***	.009***	.0035*	.0059**
	(.002)	(.003)	(.002)	(.002)	(.0015)	(.0018)
Ethnicity (Han)	-.180	-.204	-.108	-.115	-.148*	-.155*
	(112)	(.114)	(.078)	(.079)	(.070)	(.072)
Education	.213***	.179***	.174***	.162***	.078***	.071***
	(.023)	(.025)	(.016)	(.017)	(.014)	(.016)
Income (in thousands)	.0007***	.0006**	.0001	.0001	.0001	.0001
	(.0002)	(.0002)	(.0001)	(.0001)	(.0001)	(.0001)
Marital status (single as the reference category)						
Married	-.338***	-.330***	.082	.084	-.101	-.089
	(.090)	(.091)	(.062)	(.063)	(.056)	(.057)
Divorced	-.529**	-.531**	-.103	-.104	-.186	-.164
	(.160)	(.162)	(.112)	(.113)	(.100)	(.102)

Widowed	.129	.147	.117	.128	-.165	-.128
	(.203)	(.208)	(.141)	(.146)	(.127)	(.132)
Internet use intensity		-.002		.00003		.002
		(.004)		(.002)		(.002)
Internet use intensity squared		.000006		.000009		-.00002
		(.00003)		(.00002)		(.00002)
Internet use type						
Communication		-.017		-.010		-.030
		(.031)		(.022)		(.020)
Publicity		.086**		.015		.035
		(.029)		(.020)		(.018)
Entertainment		.050		.0001		.039
		(.030)		(.021)		(.021)
Information		-.028		.009		-.017
		(.033)		(.023)		(.020)
Business		.094**		.019		.032
		(.029)		(.021)		(.019)
Random effect:	.033	.030	.015	.014	.014	.014
Intercept	(.015)	(.015)	(.007)	(.007)	(.007)	(.007)
LR test	16.55***	14.28***	15.24***	12.46***	16.59***	15.53***
Model statistics:						
AIC	7240.7	7041.7	5644.4	5502.7	5179.6	5056.4
BIC	7303.4	7138.1	5707.1	5599.1	5242.3	5152.8

Notes: (1) Numbers in parentheses are standard errors; (2) from 2-tailed tests, *P<.05; **P<.01; ***P<.001; (3) under "random effect," the LR test reports the likelihood ratio statistic for testing the null hypothesis that the random effect (between-province variance) is zero; a significant test result indicates that it is necessary to include random effects in the model.

Models 7 and 8 show the result about participation in political organizations. Although including the Internet use variables improves the model fit, neither the intensity of Internet use nor the type of Internet use has any significant effect on participation in political organizations. The results regarding participation in religious and charitable organizations are shown in Models 9 and 10. Similarly, adding the Internet use variables improves the model fit, but the intensity and the type of Internet use both show no significant effect.

Discussion and Conclusion

In light of the results above, Internet use does not have a uniform effect across the components of social capital in Chinese society. Different aspects of Internet use are related to different components of social capital in differing ways. The intensity of Internet use is related to network intensity only. The time spent on the Internet is first positively related to real-world interactions with social ties; after the threshold of 18.6 hours per week, however, the relationship turns negative and additional time on the Internet would reduce social interactions. Certain types of Internet use also matter for social capital. Using the Internet for communication purposes is significantly related to more frequent interactions with social ties. Using the Internet for publicity purposes is significantly related to greater diversity of one's social networks and more participation in recreational, cultural, and sports organizations. Using the Internet for entertainment or information is not related to any component of social capital. Using the Internet for business purposes is significantly related to more frequent interactions with social ties, greater network diversity, and more participation in recreational, cultural, and sports organizations. Taken together, there is no simple answer to the question of whether the Internet affects social capital. The answer depends on how we make use of the Internet and which aspect of social capital is under study.

Moderate use of the Internet certainly facilitates our offline social interactions with others. When the Internet is used in a moderate way, it does not necessarily remove people from their offline world but may indeed be used to support more social interactions, both by keeping people in contact and by creating more new relationships (Ellison, Steinfield, and Lampe 2007). Moderate use of the Internet supports more sociability and face-to-face interactions (Sabatini and Sarracino 2014). However, if too much time is spent on the Internet, the relationship between online time and offline social interactions turns negative. Heavy Internet use detracts from face-to-face time with others and replaces an individual's time and motivation for interacting with others offline (Kraunt et al. 1998; Putnam 2000; Shah et al. 2001; Wellman et al. 2001). Too much Internet time reduces interest in social interactions in the real world (Nie 2001; Nie et al. 2002).

Besides the amount of time spent on the Internet, the motive for using the Internet also has an impact on social capital. When we use the Internet for communication, it provides an important tool that can be employed to

improve the intensity of social interactions. Online communications makes it possible to stay connected with social contacts despite geographic distance, tight schedules, increasing mobility, and other life course events. It lowers the cost of communications and offers an efficient way to stay updated on each other's recent status and latest activities. It does not necessarily replace but is more likely to promote face-to-face interactions through further strengthening the frequency and intimacy between social ties (Quan-Haase and Wellman 2002).

When we use the Internet for publicity and to promote ourselves, we are better able to reach broader social circles outside the small, closed circle surrounding us. When users publicize their profiles on online platforms, they make themselves known to more people and get to know more people, thereby building more new connections. They can thus reach a more heterogeneous network of people and also make themselves visible and available for social activities around common interests (Boyd and Ellison 2007). The Internet is a powerful tool for making us known to more diverse individuals and bringing together individuals with similar hobbies. Consequently, the use of the Internet for publicity is related to greater network diversity and more participation in recreational, cultural, and sports organizations.

When the Internet is used for entertainment or information, these online activities are usually asocial and thus have no significant effects on any aspects of social capital. Gathering information and online entertainment such as watching online videos or playing games are largely individualistic activities so they tend to have no major impact on social capital.

It is also interesting that using the Internet for business purposes such as online shopping and transactions shows a significantly positive connection with both the intensity and diversity of network capital, as well as participation in recreational, cultural, and sports organizations. Using the Internet for online transactions promotes generalized trust, and this increased trust is beneficial for building interpersonal networks and engaging in social activities with others (Grabner-Kräuter and Bitter 2015; Pasek, More, and Romer 2009). Repeated online transactions lead to greater trust and facilitate greater willingness to interact with unknown people from different backgrounds. It is also possible that socially active individuals are more trusting of others, thereby engaging in more online business activities. Hence, frequent use of the Internet for online business purposes is both an indicator and a facilitator of greater generalized trust, which contributes to greater network capital and more active engagement in group recreational

activities.

Finally, among various social organizations, Internet use (such as using the Internet for publicity and business purposes) has a relationship with participation in recreational, cultural, and sports organizations only, and none of the Internet use variables shows any relationship with participation in political, religious, or charitable organizations. This finding suggests that Internet use in China is more influential on recreational activities than on political or civic activities. The Internet may not promote political and civic participation in today's Chinese society in general. This finding reflects China's strict control and censorship of the Internet in the realm of political and civic activities, while it tolerates or even promotes the Internet for recreational and other non-political uses.

To be sure, this study is not without its limitations. First, the data are cross-sectional so we should use caution and avoid drawing strong causal conclusions. While the regression analyses find that the intensity and type of Internet use show certain connections with various aspects of social capital, the causal link does not conclusively go from Internet use to social capital. There is also a possibility that individuals with more social capital may be more likely to use the Internet in a certain way. It is more plausible that the causality is two-way. In future research, longitudinal data should be collected and analyzed. Through observing the same individuals' social capital both before and after their use of the Internet, we would be better able to establish clear-cut causality and disentangle the influence of Internet use on social capital from that of social capital on Internet use. Also, although we have proposed some tentative explanations for the revealed connections between certain types of Internet use and social capital, the underlying mechanisms are worth further investigation. For example, we call for further empirical assessment about the social capital-promoting role played by the use of the Internet for business purposes. More qualitative research (e.g., in-depth interviews) or even social experiments would be helpful in directly testing whether and how repeated online transactions can contribute to generalized trust which in turn promotes social capital. Second, the measurement for some variables is not ideal and should be improved in future surveys. For example, the network intensity variable is measured by a single survey question "How often do you have social activities with your friends (such as visiting each other's homes, going to movies together, having meals together, and enjoying recreational activities together)?" A single survey item may not be able to capture the multifaceted latent variable of network intensity. In the future, a multi-item network intensity scale should be developed that

measures the intensity of different types of interactions with one's social connections. Especially, in addition to the frequency of interactions, it is also important to include the time spent in a relationship and the depth of the relationship in the measurement (Marsden and Campbell 1984, 2012).

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