

This article was downloaded by:[Purdue University]  
On: 11 April 2008  
Access Details: [subscription number 776102522]  
Publisher: Routledge  
Informa Ltd Registered in England and Wales Registered Number: 1072954  
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Journal of Broadcasting & Electronic Media

Publication details, including instructions for authors and subscription information:  
<http://www.informaworld.com/smpp/title~content=t775648091>

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Online Publication Date: 01 March 2004

To cite this Article: Matei, Sorin (2004) 'The Impact of State-Level Social Capital on the Emergence of Virtual Communities', Journal of Broadcasting & Electronic Media, 48:1, 23 - 40

To link to this article: DOI: 10.1207/s15506878jobem4801\_2  
URL: [http://dx.doi.org/10.1207/s15506878jobem4801\\_2](http://dx.doi.org/10.1207/s15506878jobem4801_2)

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# The Impact of State-Level Social Capital on the Emergence of Virtual Communities

Sorin Matei

*The paper analyzes the 48 contiguous states of the Union and their ability to create and maintain online communities (Yahoo! groups). Multiple regression analysis indicates that the number of online groups and overall amount of online activity increase with amount of social capital. Also, ethnic homogeneity positively influences the number of online groups, while population density and number of IT workers are positively associated with level of online activity. In broad terms, the analyses support the idea that the Internet strengthens offline interaction, sociability online building on sociability offline.*

A rich literature describes the Internet's ability to foster new types of social relationships and groups (Baym, 2001; Flanagin & Metzger, 2001; Howard, Rainie, & Jones, 2002; Jones, 1998; Katz & Rice, 2002; Kazmer & Haythornthwaite, 2001; Lievrouw & Livingstone, 2002; Nie, 2001; Putnam, 2000; Smith & Kollock, 1999; Wellman & Haythornthwaite, 2002). E-mail lists, Web pages and chatting facilities make it easier than ever for people with similar interests or backgrounds to meet and maintain social ties without being in the physical presence of each other. This phenomenon, usually labeled as "online" or "virtual communities," has proliferated across the globe and is particularly strong in the United States (Baym, 1998; Matei & Ball-Rokeach, 2002; McLaughlin, Osborne, & Ellison, 1997; Rheingold, 2001; Watson, 1997). One of the important subjects of debate sparked by this development is the relationship between computer-mediated social formations and more traditional social arrangements, especially those that are geographically anchored. The Internet's rapid diffusion and the online social ties it made possible have created hopes for building "community without propinquity" (Webber, 1963), where individuals can interact at a distance through technology, rather than by face-to-face exchanges (Rheingold, 2001).

The subject was and still is a contested one. It is undeniable that computer communication has created the potential for social interaction with people, ideas and even physical locations that are far from us. However, the quality of these interactions and their role in replacing or supplementing the relationships that

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connect people to their neighborhoods, communities, or organizations is still debated. Critics of virtual communities believe that the Internet replaces our strong-bond, face-to-face social relationships with low commitment, online "weak ties" (Cummings, Butler, & Kraut, 2002) or with socially empty interactions with the technology itself (Nie, 2001; Nie, Hillygus, & Erbring, 2002). Another fear is that the Internet creates a world dominated by the "narcissism of similarity"; although online sociability can exist, it is reduced to interactions between those that are similar in terms of ideology, race, or gender (Fernback, 1997; Jones, 1997; Seabrook, 1997).

These critiques cannot, however, deny that the Internet has contributed to our understanding of what social space and relationships are. Especially during the earlier wave of Internet research, this aspect was emphasized quite successfully. Parks and Floyd (1996) have shown that online friendships can be strong and similar to those found offline. The revival of the counterculture through online experiments in social interaction, spearheaded by the one of the most important online bulletin boards, the Well, has introduced the world to the very idea of "virtual community" (Rheingold, 2001; Smith, 1992). Fan and hobby communities, such as those studied by Baym (2000) or Watson (1997) have refined our understanding of online-based social interactions.

Although these early discussions have vigorously pushed ahead our understanding of virtual sociability, they have not always taken a direct aim at the implications these emergent social phenomena could have on spatial and geographically rooted relationships and communities. Rheingold (2001), the earliest and most active promoter of the "virtual community" concept, initially minimized the fact that the Well was supported by a small group of committed individuals living in the same area, San Francisco Bay, who met each other frequently at parties, weddings, and funerals. Also, when Watson (1997) defends the right of the Phish band fans to call themselves a community, although they live scattered throughout the world, he also ignores the fact that the fans do meet periodically in person, during the live concerts of the band.

As time has gone by and the Internet has become more and more a part of everyday life (Wellman & Haythornthwaite, 2002), even some supporters of online communities (Rheingold, 2001) have come to the conclusion that rather than being divorced from the offline environments, online ties should be seen as part of a new conglomerate of social connections, part geographic and part virtual. This new perspective emphasizes that online ties subsist in many instances on at least a modicum of geographic interaction (Quann Haase, Wellman, Witte, & Hampton, 2002). Moreover, in many other contexts, social bonds online seem to shadow those pre-existing them from real-life encounters. Baym (1998), Calhoun (1986), and Contractor (1993; 1990) have made strong and early points about this interesting phenomenon, which was empirically investigated in a number of recent national and large urban studies (Howard et al., 2002; Katz & Rice, 2002; Matei, Ball-Rokeach, Wilson, Gibbs, & Gutierrez Hoyt, 2001).

The theoretical explanation for how geographic and communicative social spaces

connect has a solid foundation laid by a number of seminal pieces, among which those by Baym (2000), Contractor (1993), Calhoun (1986), Mitra (2001), and the "Toronto school" of sociology (Quann Haase et al., 2002; Wellman, 2001) are the most important. For example Baym (1998) emphasizes that social groups that emerge online are shaped by a multiplicity of contexts, including those of "external" nature (geographic location, local social networks, organizational embeddedness etc.). Similarly, other authors suggest that a technological system shapes social relationships starting from, not erasing, pre-existing local (in this case, organizational) social ties and structures (Contractor & Seibold, 1993; Contractor & Eisenberg, 1990).

Calhoun (1986) proposes that Internet and computer-mediated social relationships can be integrated in a larger taxonomy of social ties and interactions. Following Cooley (1909), Calhoun distinguishes between three types of social relationships: primary, secondary, and tertiary. Primary ties are supported by face-to-face interactions involving all aspects of individual life, such as those we have with family members. Secondary interactions are also face-to-face, but impersonal, such as those we establish during business transactions. Tertiary ties are indirect relationships we maintain with people we do not customarily meet and who represent various institutions—e.g., elected representatives, whom we support and follow without any personal acquaintance. Calhoun believes that computer-mediated communication does not lock us into only one type of relationship—i.e., secondary—as some critics seem to suggest. Instead, he thinks the Internet might reinforce local and primary bonds. This process can be counterintuitive, because, as Calhoun points out, computer-mediated communication does depersonalize some of our social interactions. For example, e-commerce and e-banking reduce or even eliminate human interactions. However, the relationships that we lose are not primary, strong-tie (i.e., those with family and friends), but secondary, weak-tie (i.e., those with sales clerks). In consequence, replacing impersonal human relationships with purely technological ones saves time, which can then be used for maintaining or reinforcing primary social relationships. This can be done in-person or via technological means—e.g., by e-mailing family members or a long-lost friend. Online social ties could, from this perspective, support and extend offline ties.

Finally, the connection between online and offline ties is noticed by Wellman and his colleagues (Hampton & Wellman, 2002; Quann Haase et al., 2002; Wellman, 2001), when they observe that e-mail or other types of electronic communication are ideal tools for preserving an "always on" bubble of sociability. Networked communication makes private, close professional or functional social circles portable. Individuals can carry with them, and have immediately accessible, the channels of communication needed to keep in touch with individuals that are vital for maintaining a sense of stability and social anchoring (Wellman, 2001).

Although still relatively poor in terms of over-time, longitudinal research, this line of theoretical inquiry has produced a number of empirical studies which show how strong offline interactions foster and connect with strong online ties. For example, a study of Los Angeles neighborhood residents has found that the higher the level of

"belonging" (which is an equivalent, although not identical, way of measuring social capital), the higher the likelihood of making friends online (Matei & Ball-Rokeach, 2002). The same study also found that in the English-speaking neighborhoods of Los Angeles, being connected to the Internet is associated with community organization membership and indirectly with social capital formation (Matei & Ball-Rokeach, 2003).

Looking at social support, Howard, Rainie & Jones (2002) showed, controlling for basic socio-demographics, that those who have gone online have 24% greater odds of saying that they do know other people to turn to in times of need, than people who have never gone online. Data provided by four Syntopia surveys (1995, 1996, 1997, and 2000) have shown that, controlling for demographic differences, Internet use is associated with increased community and political involvement. Compared to non-users, users were significantly more likely to belong to at least one community organization, both in the 1995 and 2000 surveys (Katz & Rice, 2002). Analyses of the General Social Survey 2000 Internet module have shown that Internet users are also more likely to connect with friends or family members than non-users (Neustadtl & Robinson, 2002), and that Internet users who engage the Internet for social purposes are more likely to spend time with their friends (Matei, 2004).

American and Canadian surveys also reveal that heavy Internet use is associated with increased participation in voluntary organizations and politics (Quann Haase et al., 2002). Most electronic contact is with friends and relatives living within 30 miles of one's residence, which supports Wellman's (2001) argument for the emergence of "networked individualism." The Internet allows us to keep in contact with friends who are socially and geographically dispersed, yet distance still matters: wired, wireless, or face-to-face communication is in many instances more intense with those physically closer to us (Quann Haase et al., 2002).

The confluence of real and virtual social relationships and spaces documented in various empirical studies might be a sign for the emergence of what Mitra and Schwartz (2001) call the "synthetic spaces," which combine features of real-geographic and virtual universes. As Mitra and Schwartz affirm: "The fascination with examining space . . . often glazes over the fact that cyberspace is embedded in very traditional and essential elements of real space" (Mitra & Schwartz, 2001, ¶27). Continuing, they add that if de Certeau (1984) is right, that space is created by the way in which it is used, cyberspace is anchored in the practices of everyday life. By extension, this can also mean that the less we are communicatively tethered to one specific space, the more we can in fact zero-in on any specific space to build a social network around it.

Immigrants and those who use the Internet to maintain connections to various primary social spaces are especially more likely to employ communication technology as a bridge between geographic space and cyberspace (Mitra, 2001). These geographically displaced individuals have a far greater chance of staying anchored to a specific space of reference: a hometown, an alma mater, an ethnic neighbor-

hood in a U.S. megalopolis, or their native country (Ball-Rokeach, Gibbs, Jung, Kim, & Qiu, 2000). These spaces acquire a greater importance in the Internet age than previously because computer-mediated communication makes it possible for immigrants to constantly monitor and renew their social ties with a physical space of origin or reference. In consequence, geographic space can become more, not less, important (Ball-Rokeach et al., 2000).

Seeing the relationship between "real" and "virtual" spaces as facets of the same conglomerate of phenomena (Mitra & Schwartz, 2001) has the innate advantage of eliminating the need for cumbersome distinctions between online and offline social universes. We do not need to see them as two different worlds, inhabited by two different species of people. The framework that emerges, especially from Calhoun (1986), Mitra (2001), and Wellman's team (Quann Haase et al., 2002; Wellman, 2001), compels us to think about the two as two facets of the social lives of the same individuals. The resources individuals use to construct their social lives will, thus, in the end be rooted in the same processes, which have to do with the basic datum of human life: the need for community and interaction with other people.

However, this should not lead to the conclusion that because the two phenomena are branches of the same tree, they will bear the same fruits. The social interactions in the two spaces are not functionally equivalent or interchangeable. While the Internet side of the new "synthetic space" is more likely to be woven by a mix of weak and strong ties, its offline facade is more likely to be sustained by strong bonds focusing on primary relationships (Williams, 2003).

### **Internet, Social Capital, and Macro-Social Units**

The warrant for the complementarity claim can be further supported by examining the relationships between "real" (geographic) and "virtual" social aggregates through the lens of "social capital" theory. Coleman (1988) defines social capital as the *potential* to engage and sustain efficacious communities. Social capital is a complex relational phenomenon that spans multiple temporal and social levels; it is both conjectural and historical, institutional, and personal, etc. In Coleman's understanding (1988), social capital is a relational property of individuals and of the social groups they form. Its immediately measurable dimensions are: multiplicity and strength of ties between social actors (manifested as obligations and expectations), social norms related to trust, and access to and density of information channels (1988).

The relational nature of the concept is of paramount importance. Trust, obligations, or information do not exist in absence of individuals exercising or transacting them. On the other hand, individuals cannot get access to information, exercise trust, or enforce norms as isolated entities. Social capital is consequential because it makes possible a meeting of minds and wills toward accomplishing a common goal. Also described as a community's propensity for reaching "closure"—its capacity to link

through indirect ties individuals and groups that do not directly communicate—social capital is the nutritive tissue from which civic organizations and collective action grow and is best studied when analyzing social groups with a territorial base (Mohan & Mohan, 2002).

Putnam, who has redefined social capital to more strongly emphasize trust, generalized reciprocity,<sup>1</sup> and civic action, has also focused some of his empirical research on discerning the difference social capital makes in the life of the 50 states of the American union (Putnam, 2000). He starts from the premise that states are clearly individualized social units of the American polity. They are differently shaped by political institutions, immigration history, geographic and communicative location, economic power, and civic traditions. These characteristics inflect the cultural, normative, and civic infrastructure of their populations. In essence, social capital will vary in the states of the Union with level of trust, density of informal and formal networks, and commitment to “generalized reciprocity.” His choice of studying social capital at the state level emphasizes that this concept does not reside entirely in individuals and even less in a specific tool, object, or material infrastructure. It is, rather, part of the geo-regional culture and of the web of connections people maintain as “social animals” in their geographically rooted communities of various sizes. Intense reciprocity, density of social networks, and cultural homogeneity, all make strong communities, of which states are some of the most important (Putnam, 2000).

Following Putnam’s macro-social operationalization of social capital theory and interest in states as units of analysis, and using the theoretical framework reviewed above (Calhoun, 1986; Mitra & Schwartz, 2001; Wellman, 2001), which proposes that real and virtual spaces are intrinsically connected and echo each other, we would like to investigate if higher level of social capital offline translates into a higher level of online social activity. This does not mean to say that we need to look for signs of social capital creation online, or if the social capital online is “as good” or “as strong” as the one we find offline. More modestly, at least for the current understanding of these phenomena, we would like to find out if there is a reflection in the arena of online, group-level phenomena of social processes that have developed in the offline world.

If we agree, as Putnam proposes, that generalized reciprocity is an effect of normative orientations and values, which precede social encounters, the answer to the question, “Do offline social environments mirror phenomena online?”, should probably be “yes.” Putnam himself gives indications that the answer should go in this direction. He draws on historical precedents, which have already documented similar processes in older telecommunication systems, especially the telephone (Boorstin, 1973; Fischer, 1992; Pool, 1977, 1983), and on more recent explorations (Brown & Duguid, 2000; Smith & Kollock, 1999), especially those conducted by Wellman and his associates (Hampton & Wellman, 2002; Wellman & Gulia, 1999; Wellman et al., 1996). This led him to the conclusion that the Internet might reinforce local ties. When embracing new forms of telecommunication, Americans

do more of what they have already been doing (and more easily), including a lot of local “communing” (Putnam, 2000). Viewed from this perspective, the relationship between online use and real-life social capital should not be seen as a zero-sum game. Even more importantly, the relationship can even be reversed: “[s]ocial capital might be a prerequisite for, rather than a consequence of, effective computer-mediated communication” (Putnam, 2000, p. 177).

## Research Questions

In consequence, there is good evidence of a positive relationship between online and offline ties. Yet the literature reviewed above is mostly concerned with individual effects, a shortcoming this study would like to address. Therefore, the present investigative strategy is to reveal if and how social capital, seen as a macro-social characteristic of communities and geographic/territorial units, is connected to emergent cyber-mediated social formations covering the same geographic units.

This line of research, directed at macro-social units, is a new one and relatively underexploited (Mohan & Mohan, 2002). This is surprising, since the theoretical and methodological groundwork necessary for examining how social capital works at macro-social levels was already laid out by Putnam. In his view, social capital is closely associated with, and probably indispensable to, various geographic communities and has its most visible effects when acting at a macro-social level (Mohan & Mohan, 2002; Putnam, 2000). He also developed a number of social capital measures—both at individual and group levels of analysis. One of the most robust is that designed to capture the amount of social capital found at state level. Putnam uses it for predicting which states will be more civically oriented. His goal was not, however, to correlate this measure with the amount of virtual “communing” found in a state. His main focus was to predict which states will be more or less vulnerable to the ills of our times: crime, poverty, or poor educational systems. Detecting the relationship between social capital and virtual community-generation/formation is one of the goals of this study. The first research question asks if online communities are rooted in offline resources, i.e. social capital:

RQ1: Do states with higher level of social capital have a higher propensity to create online communities?

This question, straightforward in appearance, can obscure, however, a crucial distinction, which has to be addressed as another, separate research question. The distinction is that between presence (emergence) of virtual (online) communities, and that of emergence of *vital, active* cyber-mediated groups. It is well known that the declining cost of online communications has made it extremely cheap to set up and run a listserv, bulletin board, e-mail list, or newsgroup. Given the tools, probably many socially inclined and high social-capital individuals and communities will set



up new online groups. Taking advantage of new media, many areas with high social capital will probably naturally extend their activities to the cyber-mediated realm.

We should, then, look at the relationship between social capital and Internet socialization in a more refined way. This can be accomplished by operationalizing "Internet sociability" not as a simple raw count of online groups, but as an amount of activity generated by these groups. In the end, it is not the sheer presence of Internet-mediated groups that indicates the emergence of a new social formation, but their capacity to generate social dialogue, to engage people and extend public discourse.<sup>2</sup> In consequence, the research question should be reformulated to find out if social capital is connected with vibrant, active online communities or not:

RQ2: Do states with a higher level of social capital host the most active online communities?

## Method

The present paper employs three types of data: a) state-level social capital; b) extent and intensity of Yahoo! groups activity; and c) state-level socio-demographic variables. Social capital is operationalized using Putnam's state-level index. Online activity is operationalized as an inventory of Yahoo! groups dedicated to each of the 48 contiguous states of the Union and as the number of messages sent to each group by their members. The socio-demographic variables include income, preponderance of technologically sophisticated workers in the labor force, population density, and percentage of population that is foreign born. The broad research strategy is to investigate if, using the states as units of analysis and with adequate controls, a higher level of social capital predicts higher levels (counts) of Yahoo! groups and higher levels of activity in these groups.

### Data collection and variables

In what follows, the main variables, their origin, and any special issues related to them are described.

*Social capital.* The Social Capital Index is a synthetic measure first used by Putnam in *Bowling Alone* (Putnam, 2000, pp. 290-291). The index, detailed in the Appendix, combines 14 measures. Consistent with the manner in which social capital is conceptualized, this is a cross-level of analysis measure (Lochner, Kawachi, & Kennedy, 1999; Portes, 1998), incorporating both individual characteristics, aggregated at the state level, and group (state) level measures. Some of the variables include: interpersonal contact, amount of trust state respondents have in other people (a proxy for generalized reciprocity), political (electoral) participation, level of direct involvement in local community affairs, and density of local community organizations (see Appendix). The index, a complex one, addresses both static

(attitudinal) and dynamic (behavioral) characteristics. It captures, for example, level of social engagement (e.g. volunteerism), and the norms and attitudes that support this participation. The measures were combined from a variety of sources (see Appendix). A full explanation of their origin can be found in Putnam (2000) or on the book's companion website (<http://www.bowlingalone.com>).

The Social Capital Index score for each state is the average of the standardized scores on the 14 items. The Cronbach alpha score of index scalability is .80. The internal validity of the Index is also supported, according to Putnam, by principal factor analysis and by the fact that of the 91 possible bivariate correlations between the fourteen indicators, 88 are significant and in the proper direction. The mean intercorrelation coefficient is .56 (Putnam, 2000). Scores are available only for the 48 contiguous continental states. Alaska and Hawaii are excluded from all analyses.

*Online presence and activity.* Data related to online activity were obtained from the Yahoo! groups. The Yahoo! groups are, after the Usenet newsgroups, probably the largest and most sophisticated system of online interaction. The groups are complex messaging and information retrieval systems, allowing their members to establish online profiles, exchange messages, post photographs, contribute to a group data base, and chat. Their coverage is impressive. At data collection time (December 2001—March 2002) there were about of 1.3-1.4 million groups, with a probable total membership of 50 million.<sup>3</sup> The groups are divided into categories (Business and Finance, Cultures and Community, Regional, etc.; see <http://dir.groups.yahoo.com/dir/>). Data were collected only from the groups listed under the Regional/U.S. states category. These are groups dedicated to discussions and interaction between people living in, or interested in, a specific state of the Union. At the beginning of 2002, for the 48 contiguous states of the Union, there were 4,621 groups listed, with 171,366 members, who had generated 343,149 messages. All groups listed for each state were included in the data set. However, for analysis purposes, groups whose unique interest is to exchange or distribute pornographic materials (467 of total, representing about 10% of all the groups, with a total of 63,406 members) were excluded. This was justified by the fact that although a certain kind of sociability might result from participating in these groups, the ultimate pay-off, sexual gratification, is not directly related to the family of phenomena of interest here (civic participation and social capital).

The Web site of each Yahoo! group provides information about number of members, intensity of interaction (number of messages broken down by time periods), and until early this year, founder background information (gender, occupation, etc). The data were collected as part of a research methods class, in which undergraduate students were asked to collect data from the site. Each student was responsible for about 100 groups. A data collection protocol and appropriate training were provided.

The Yahoo! groups provided the raw data for the two dependent variables: density of groups and mean level of club activity, both at state level. The first variable is operationalized as number of groups divided by state population; the actual indica-

tor used was groups per 100,000 state residents. Level of activity is represented, for each state, as average number of messages per group member.

*Socio-demographic variables.* The socio-demographic variables used in this study were introduced for control purposes. They include measures of economic wealth, percentage of technologically sophisticated workers in the labor force, population homogeneity (percent foreign born), and population density.

The theoretical justification for these variables is anchored in the literature review. The first two variables, economic and technological development, represent major infrastructural preconditions for maintaining online communities. States that have richer or more technologically sophisticated workers will be more likely to create opportunities for online socialization. Economic wealth is measured as state-level income per capita for 1999, as reported by the U.S. Census Bureau. Technological sophistication is measured as number of information technology (IT) workers per 10,000 state residents. This measure is preferred to others, and especially the obvious one, Internet penetration, due to conceptual and statistical reasons. Conceptually, the measure covers a larger ground than a simple measure of Internet penetration. It reflects to what extent advanced technological skills are present in a state and how much high technology dominates the labor force. Second, Internet penetration or other more direct infrastructural factors are more highly correlated with social capital (the Pearson  $r$  coefficient is greater than .50) than number of IT workers, increasing the likelihood of multicollinearity effects in regression analyses.

The other two variables, population homogeneity and population density, were introduced in the equations to eliminate the possibility of spurious effects. Previous studies have found population density to be associated with technological diffusion. The Internet is an urban, high population density phenomenon, as some studies suggest (Downes & Greenstein, 2002; Grubestic, 2002). Also, according to Putnam's index, the states with the highest level of social capital (South and North Dakota, Vermont, Minnesota and Nebraska) are more likely to be ethnically homogeneous and less densely populated. Theoretically, density and homogeneity can interfere with our analysis because, as Coleman (1988) suggests, social capital is more likely to emerge where local social networks are more likely to come to closure—i.e., where community interactions span multiple associational and informal groups. This is usually specific to smaller, more isolated, and ethnically homogeneous communities (McCulloch, 2003).

Introducing population homogeneity as a control variable is also justified by Putnam's (2000) distinction between the bonding and the bridging functions of social capital. The bonding function is particularly strong in ethnically homogeneous spaces and communities. Ethnic homogeneity tends to facilitate the growth and diffusion of networks, social or otherwise (Portes & Sensenbrenner, 1993). Thus, ethnic homogeneity should be controlled for when trying to disaggregate the unique effect of social capital on a target variable, because homogeneity encourages social capital production.

Operationally, ethnic homogeneity is measured as percent of residents foreign

born (as measured by the 2000 Census), such that states with lower rates of foreign-born population are considered more homogeneous.<sup>4</sup> Population density reflects the 2000 U.S. Census data.

## Analysis

Two multiple regression models were run, one for each of the two dependent variables. The goal was to ascertain if, controlling for relevant variables, state-level social capital has a positive impact on presence and intensity of activity in the Yahoo! groups dedicated to the 48 contiguous states of the Union.

The first multiple regression procedure determined that social capital is significantly associated with number of Yahoo! groups (see Table 1). The  $\beta$ -value for social capital index is a relatively large .44, indicating that the higher the amount of social capital in a state, the higher the number of Yahoo! groups per 100,000 residents. State ethnic homogeneity is also positively associated with number of online groups per 100,000 residents. The higher the number of U.S.-born residents, the higher the number of clubs. The model  $R^2$  is .44 (adjusted, .37), indicating that less than half of the variance in the number of Yahoo! groups dedicated to any particular state is explained by the independent variables.

**Table 1**  
**OLS Coefficients for Variables Predicting Number of Yahoo! Groups Per 100,000**  
**State Residents ( $N = 42$ ; all variables entered simultaneously)**

	Unstandardized Coefficients		Standardized Coefficients		
	<i>B</i>	<i>S.E.</i>	$\beta$	<i>t</i>	<i>p</i>
Constant	4.53	1.41		3.20	.00
Social capital Index Score	.06	.02	.45	3.29	.00
Percent population foreign born	-.00	.00	-.35	-2.16	.04
Population density	.00	.00	.21	1.23	.23
IT workers per 10,000 residents	.00	.00	.14	1.12	.27
Income per capita	-.00	.00	-.26	-1.31	.20

$R^2 = .44$ ; Adjusted  $R^2 = .37$

In conclusion, the first research question: "Do states with higher level of social capital have a higher propensity to create regional online communities?" should be answered in the affirmative. There is a positive association between the two variables.

The second research question asks if there is an association between social capital and Yahoo! group activity, measured at state-level as average number of messages

per group member (see Table 2). The results indicate that social capital is again positively and strongly associated with intensity of group activity. The standardized beta is similar, in value, to the one obtained in the first model: .47. However, in addition to social capital, number of IT workers and population density are also positively associated with online activity. States that have a higher proportion of technologically sophisticated residents and are more densely populated are more likely to generate active groups. The standardized betas for both variables are quite strong—.30 for number of IT workers and .40 for population density. Finally, this model, just like the previous one, explains a substantial amount of the variance in the dependent variable: 36% (adjusted  $R^2 = .27$ ).

**Table 2**  
**OLS Coefficients for Variables Predicting State-Level Mean Group Activity**  
**(Messages/Yahoo! Group Member) ( $N = 42$ ; all variables entered**  
**simultaneously)**

	Unstandardized Coefficients		Standardized Coefficients		
	<i>B</i>	<i>S.E.</i>	$\beta$	<i>t</i>	<i>p</i>
Constant	4.82	1.75		2.77	.00
Social capital index score	.77	.24	.47	3.15	.00
Population density	.00	.00	.40	2.19	.03
Percent population foreign born	.04	.04	.19	1.07	.30
Income per capita	.00	.00	-.32	-.15	.15
IT workers per 10,000 residents	.00	.00	.30	2.15	.04

$R^2 = .36$ ; Adjusted  $R^2 = .27$

## Discussion

The goal of the present paper was to investigate the relationship between social capital and emergence of virtual communities. It compared the 48 contiguous states of the Union in terms of their level of social capital and their ability to create a specific type of online communities, those that are geographically focused. The assumption is that social capital is one of the most fundamental ingredients of social aggregates, be they off- or online. Yet, the paper does not inquire in the nature and quality of online social capital; its main aim is to determine if there is a positive association between online and offline social phenomena, broadly defined. The results lead to the tentative proposition that geographic units generate a number of online groups and an overall amount of online activity commensurate with their social capital endowment.

A first multiple regression analysis indicates that state-level social capital linearly

increases with number of groups per 100,000 state residents. Also, ethnically homogeneous states are more likely to generate online clubs. Scrutinizing the issue more deeply and trying to determine if social capital endowment makes a difference in terms of vitality of interaction in the online communities studied, we came to the conclusion that the relationship is again positive and significant. Increase in social capital is associated with increased number of messages per group member. Also consequential for level of activity are the density of the population and presence of technologically sophisticated workers in the labor force.

The fact that we have captured effects above and beyond those for social capital extends our knowledge of the way in which online sociability is generated at state level. First, we should note the fact that ethnically homogeneous states are more likely to generate online groups. This seems to indicate that it is what Putnam calls the "bonding" aspect of social capital that extends into cyberspace. Although ethnic minorities do use the Internet to a great extent, this might be a global, rather than a local, geographic affair. This resonates with some in-depth, recent studies conducted on Los Angeles ethnic minorities (Matei & Ball-Rokeach, 2002, in press). For example, although the Chinese and the Korean minorities studied in this metropolis were the ones more likely to use the Internet for making a friend online, they have some of the lowest social capital resources in that metropolitan area and seem to use the Internet, at the macro-social level, the least for dealing with their local, Los Angeles problems. Their focus seems, rather, to keep in touch with their families and friends in the country of origin (Gibbs, Ball-Rokeach, Jung, Kim, & Qiu, 2003).

The association between population density or technological sophistication with online activity also deserves some discussion. The fact that an increase in online activity is matched by higher population density confirms a number of previous studies conducted in the United States (Downes & Greenstein, 2002; Grubestic, 2002). These emphasize the fact that the Internet is an urban phenomenon. Urban areas, which are also more densely populated, are the social environments of choice for the new economy and Internet diffusion is associated with the revival of the urban cores as hubs for high-tech, high-creative skills production areas (Kotkin, 2001). In this environment the social potential of the Internet is used to the maximum. Life in urban or high-density population areas is characterized by a diversity of social relations and by increased probability of meeting and socializing with people of a large variety of interests. This facility of social encounters seems to translate into a greater need for communicating and interacting with other people online. The fact that population density is positively associated with activity in online groups, but not with number of groups per capita, also reveals that what matters is not necessarily the better technical infrastructure urban areas have, which allows easier access to interacting in cyberspace, but the cultural style associated with urban life, which encourages people to adopt the online "lifestyle" at a higher rate than the cultures of other geographic environments.

The association between proportion of IT workers in the state labor pool and online activity can be explained, in addition to the obvious reasons, by the fact that

IT workers are also the opinion leaders, early adopters, and principal contributors to many online environments. In addition, the fact that this variable is significant only in the model for online activity suggests that although the Internet has been tamed at the level of access, maximizing its social use needs dedicated and skilled individuals. States populated by larger groups of "symbolic manipulators"—IT workers—are more likely to produce a superior level of online activity because individuals occupied in the IT industries are those who know how to maximize the use of the medium socially. They are probably those who seed the groups with ideas and discussion threads and make them successful (Kotkin, 2001; Rheingold, 2001).

How do these explanations and findings support the main goal of this paper, which is to make a contribution to the current discussion about the macro-social effect of the Internet? What emerges from the data presented here is a process of magnification of pre-existing social capital (Matei & Ball-Rokeach, 2002; Quann Haase et al., 2002). This is, however, socially and culturally inflected. The Internet seems to catalyze social life in the highly populated, technologically sophisticated states. The image most consistent with our findings is that "the rich grow richer." This is aligned with some of the studies conducted at the individual level of analysis mentioned in the literature review (Katz & Rice, 2002; Neustadt & Robinson, 2002; Quann Haase et al., 2002).

These are tentative explanations and explorations of a very interesting topic, whose ramifications we are only starting to understand and the present paper is just the beginning of a long and more laborious process. Although offering an interesting perspective on an important topic, one should acknowledge the limitations and challenges of the present data set and variables.

First, the data are limited to the Yahoo! groups. Although one should not underestimate their importance in the general economy of the online universe, they do not exhaust the online experience. Second, the Yahoo! groups studied here are geographically focused to begin with. The strength of the association between online and offline social groups is thus much enhanced. However, one should also note that this does not vitiate our discussion; to the contrary, it strengthens it. Our main focus is to find what role the Internet plays in creating or discouraging social life in specific locales. In a sense, our data allows us to "hold constant" the fact that the Internet can be used for a variety of social goals, many of them nonlocal or nongeographic. The issue we are pursuing here—how online and offline social interactions converge or diverge, is better served when dealing with entities of the same nature. These issues, however, should not be ignored, and a more complete data set, investigating 16,000 groups, local and nonlocal, is being collected. This will allow a better and more complete exploration of these issues, which will strengthen our understanding of the relationship between online and offline social ties.

In addition, this line of inquiry could definitely benefit from more sophisticated analysis methodologies. The regression models reported here, although explaining between 35 and 45% of the variance found in the dependent variables, need further refinement. Identifying the factors responsible for the rest of the variance is a priority.

New models and analysis tools should be explored, using path analysis or structural equation modeling, taking into account the fact that between the predictor factors and the dependent variables there could be a large number of intervening variables.

Hopefully, this line of research opens up a productive discussion about the relationship between social capital and online activity at a macro-social level, which will be joined by other scholars in our field.

## Appendix

Robert Putnam's Social Capital Index is presented and discussed in Putnam (2000, pp. 290-291). The data set can be downloaded from <http://www.bowlingalone.com>

1. % of state respondents who agree that "I spend a lot of time visiting friends"<sup>1</sup>
2. % of state respondents who agree that "Most people can be trusted"<sup>2</sup>
3. % of state respondents who agree that "Most people are honest"<sup>1</sup>
4. % respondents who attended any public meeting on town or school affairs in last year<sup>3</sup>
5. % of state respondents who served as officers of some club or organization in last year<sup>3</sup>
6. % of state respondents who served on a committee of any local organization in last year<sup>3</sup>
7. Number of civic and social organizations per 1000 population<sup>4</sup>
8. Average number of club meetings attended by a typical state resident in the last year<sup>1</sup>
9. Average number of group memberships for a typical state resident<sup>2</sup>
10. Average number of times a typical state resident volunteered in last year<sup>1</sup>
11. Average number of times a typical state resident entertained at home in last year<sup>1</sup>
12. Average number of times a typical resident worked on a community project in last year<sup>1</sup>
13. Number of non-profit (501(c)3) organizations per 1000 population<sup>5</sup>
14. Turnout in presidential elections, 1988 and 1992<sup>6</sup>

### *Data Sources:*

1. DDB Worldwide Lifestyle Survey
2. General Social Survey
3. The Roper Poll
4. Federal Insurance Contribution Act
5. Internal Revenue Service
6. Federal Electoral Commission

## Notes

<sup>1</sup> The principle of "generalized reciprocity" is a social norm. For people living in the same neighborhood is the rule that: "I'll do this for you without expecting anything specific back from you, in the confident expectation that someone else will do something for me down the road" (Putnam, 2000, p. 21). This leads to a form of "social externality" in that the behavior generalized reciprocity generates benefits not only the individual but the community as a whole. Putnam uses this example to illustrate the principle: "If the crime rate in my neighborhood is lowered by neighbors keeping an eye on one another's homes, I benefit even if I personally spend most of my time on the road and never even nod to another resident on the street" (Putnam, 2000, p. 20). The benefits of social capital generalized reciprocity are similar, believes Putnam, to those of a monetized economy. Money-based economies, compared to those relying on barter, are superior because if we do not have to pay up in kind, but only to give a promissory token that can in turn be traded, a lot more can be accomplished. The key element in this arrangement is trust. Trustworthiness, as Putnam puts it, "lubricates social life."

<sup>2</sup> It is important to note that the goal here is not to measure social capital online, for which e-mailing and posting messages would be a very poor fit. Rather, the goal is to detect a statistical association between social and civic phenomena offline and amount of dialogue online. This would only determine if offline processes make a difference in terms of amount of social activity online, and if the two reflect a specific characteristic of the population living in these states (higher social capital). Dialogue and conversation, however, as some researchers



emphasize, is a good reflection of a strong, vital community and a good predictor for social engagement (Ball-Rokeach, Kim, & Matei, 2001; Wyatt, Katz, & Kim, 2000).

<sup>3</sup> The estimate is based on a 10% sample of all the groups, which was extracted and analyzed by the author. Average group membership was 39 members.

<sup>4</sup> Data available for download from <http://www.census.gov>.

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