Does Internet Use Crowd Out Face-To-Face Ties? Empirical Evidence from the Cumulative General Social Survey Data

Hun Myoung Park
International University of Japan

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Hun Myoung Park, Ph.D.
Assistant Professor
Public Management and Policy Analysis Program
Graduate School of International Relations (GSIR)
International University of Japan
Office 328, 777 Kokusai-cho, Minami
Uonuma-shi, Niigata 949-7277, Japan
kucc625@iuj.ac.jp, (025) 779-1424

Abstract: this study examines if Internet use crowds out or facilitates face-to-face ties by analyzing the cumulative General Social Survey data. Assumed is that the impact of Internet use varies according to types of Internet services and modes of Internet use. GSS data show that face-to-face engagements measured in spending a social evening, friends, and relatives staying in contact with, and voluntary membership remained almost unchanged for the past four decades. No sharp slash or jump was observed before and after the late 1990s. Spending a social evening with relatives, neighbors, and friends are not influenced by Internet use regardless of whether they are email, WWW, or deliberative and entertaining purposes. Emailing and deliberative use of WWW are positively related to the number of friends and relatives keeping in touch with by face-to-face, meetings or events, telephone, and U.S. postal mail, while the time spent for WWW has the negative effect. Finally, voluntary membership is positively associated with deliberative use of WWW and not with email and WWW use for entertainment. The Internet is not necessarily a technology culprit of the decline in social capital but its impact depends how effectively people use for society and themselves.

Does Internet Use Crowd Out Face-To-Face Ties?

Since Coleman's (1988) seminal work, social capital and civic engagement have been widely discussed and related literature has been flooding in social sciences. Despite absence of unanimously agreed definition, social capital as a property of communities is commonly known to have positive impact on society.[1] However, many empirical studies report that social capital, in particular political engagement have decreased for the past several decades in the United States (Putnam 1995, 2000; Skocpol, 2003). Scholars have been concerned with this decline in civic engagement and have been seeking why. As technology has advanced rapidly since the middle of the twentieth century, a group of scholars have suspected that technology contributed to the erosion of social capital and civic engagement.

Putnam (1995: 677-680) aggressively claims that television has destroyed social capital through displacing social and leisure activities outside the home and providing skeptical and pessimistic outlooks on human natures, especially during childhood socialization. These time displacement and mean world theses immediately triggered considerable debates on their relevance. Norris (1996) notes that TV has multiple channels (programs) and TV viewers are not homogeneous, and concludes that the amount of TV watching is not significantly influencing political participation when covariates are controlled and types of media use matter. Similarly, Shah (1998) and Moy, Scheufele, and Holbert (1999) echo that time spent watching TV is less important than what citizens are watching and instead time spent reading news papers affects civic engagement positively. Uslaner (1998) claims that TV watching does not influence civic

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[1] Coleman (1988: S101-S105) introduces social capital as a neutral concept and recognizes three forms of social capital: obligations, expectation, and trustworthiness of structures; information channels; and norms and effective sanctions. Putnam (2000) broadly defines social capital as "connections among individuals—social networks and the norms of reciprocity and trustworthiness that arises from them" (p. 19). Cooper (2005) defines civic engagement as "participating together for deliberation and collective action within an array of interests, institutions and networks, developing civic identity, and involving people in governance processes" (p. 534).

engagement but optimism for the future does and that Putnam's time displacement effect of TV watching is not supported empirically.

Again Putnam (2000) contends that the Internet, despite its potential benefits for civic engagement, may not easily recover decline in conventional forms of social capital as expected by technology hypes. He does not insist that the Internet destroys social capital just as TV watching displaces time for social activities, but his stance is cautious and appears to conceive that the Internet is not comparable to face-to-face communications. Putnam's work facilitates another debate on the relationship between Internet use and civic engagement. Nie and Hillygus (2002) report that time spent on the Internet displaces social activities, TV watching, and reading time. However, Shah et al. (2002) make a counterargument that time spent online is positively associated with public attendance and civic volunteerism. In a study of peoples' use of daily time, Robinson et al. (2002) find that the Internet can be both time displacer and enhancer. Likewise Wellman et al. (2001) survey Web site visitors and conclude that the Internet supplements social capital. Kraut et al. (1998) report that Internet use is associated with decline in social involvement, but Kraut et al. (2002) later make a revision to produce the opposite results. Given mixed results of empirical studies, how do we reconcile the positive impact of the Internet on civic engagement with negative or skeptical effects?

This paper revisits Putnam (1995, 2000) and seeks answers for following questions. Does Internet use crowd out face-to-face ties and thus destroy social capital? Should Internet use, like TV watching, be blamed for the ebb of face-to-face civic engagements? Have face-to-face engagements really declined for the past one and a half decades? Most researches focus on political and electoral engagements, but a few explore non-political engagements. This study posits that the impact of Internet use varies according to the types of Internet services, modes of

Internet use, and individual civic engagements (Park, 2007). The next section summarizes literature regarding the relationship between the Internet and civic engagement. Then the General Social Survey data and methodological strategies are explained. An analysis section explores if face-to-face civic engagement has decreased, if Internet use makes difference in the civic engagement, and if types of Internet use matter. Finally, some implications for public policy and management are suggested as conclusion.

The Internet and Civic Engagement

There have been voluminous studies regarding how the Internet affects various aspects of society such as digital inequality, social capital and communities, political participation, electronic government and democracy, and organizational and cultural changes (DiMaggio, Hargittai, Neuman, and Robinson, 2001; Robbin, Courtright, and Davis, 2004). Literature on Internet use and civic engagement has produced mixed results (Boulianne, 2009: 198-201).[2] Many optimistic studies report a positive (mobilization) effect of Internet use on civic engagement, while pessimists contend that the Internet reinforces existing power relationships and patterns (Davis, 1999; Norris, 2001). The skeptical view, contrasted with the technological determinism of the mobilization and reinforcement theories, posits the normalization theory that the Internet, despite its potential, neither destroys nor facilitates civic engagement but reflects "politics as usual" (Bimber, 1999; Delli Carpini and Keeter, 2003; Margolis and Resnick, 2000). These mixed results appear to come not only from lack of rich data but also from diversity of civic engagement and different measures of Internet use.

The concept of civic engagement varies across scholars and practitioners (Robbin, Courtright, and Davis, 2004; Weissberg, 2005). Many researches focus on political and electoral

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[2] In this paper, civic engagement is broadly defined to be equivalent to social capital, civic participation, civic involvement, social involvement, and the like.

engagement, such as voting and attendance at campaign, largely because these engagements are easy to measure (Jennings and Zeitner, 2003: 313; Weissberg, 2005: 22-26). However, civic engagement may be political or non-political, deliberative (e.g., discussion on politics) or action-oriented (e.g., donation), electoral or non-electoral, and partisan (e.g., campaign volunteering) and non-partisan. Verba, Scholzman, and Brady (1995: 43-78) analyze various forms of civic engagement (political participation) by differentiating them according to their capacity to convey information (message), strength of pressures, and required resources. Putnam (2000) explores a broader range of social capital including political participation, religious participation, informal social connections, volunteering, philanthropy, reciprocity, honesty, and trust. Other scholars pay attention to specific engagements such as psychological well-being (Weiser, 2001), political involvement (Bimber, 2001; Jennings and Zeitner, 2003), social (or interpersonal) trust (Beaudoin, 2008), and social ties (Zhao, 2006). Different definitions and measures of civic engagement appear to contribute to the conflicting results of empirical studies.

Another key issue is how to define and measure Internet use. The Internet provides various Internet services (e.g., Telnet, email, Usenet, World Wide Web, and FTP) and individual applications (e.g., Web sites, message boards, and chat rooms) have distinct implications for a type of civic engagement (Bimber, 2001; DiMaggio et al., 2001; Norris, 2000). However, many studies, largely due to lack of rich data, ask whether or not to have used the Internet without differentiating specific applications. In a reply to Putnam (1995), Norris (1996) contends that the amount of TV watching does not significantly influence political participation negatively and that instead media content (e.g., watching network news and public affairs programs) and types of TV viewers matter. Similarly, Shah (1998) concludes that the amount of TV watching is less important than what citizens are watching. Wellman et al. (2001) suggest differentiating between

social and "asocial" activities (e.g., e-mail ad chatting versus Web surfing). Along the same line, Zhao (2006) differentiates between email, World Wide Web (WWW), and two-way communication applications like chatting and finds that "social use" of the Internet (i.e., email and two-way communications) is positively associated with social ties. Park (2007) analyzes the 2004 Pew Internet Tracking Survey data to examine how electronic government use differs from use of campaign Web sites with respect to partisan and non-partisan civic engagement. Both Zhao (2006) and Park (2007) employ binary variables for uses of Internet applications.

Many researches posit a unidirectional causality that Internet use affects civic engagement. This simple causality has been criticized. DiMaggio et al. (2001) argue that a unidirectional relationship between the Internet and civic engagement is a misspecification or a nebulous causal structure; their relationship may not be unidirectional but rather reciprocal. Norris (2000: 316-319) echoes that Internet use and engagement may be iterative and interactive in the virtuous circle. Uslaner (1998) employs a simultaneous equation model to find that TV watching does not influence membership in voluntary association and Shah (1998) fits a structural equation model to test a reciprocal causality between civic engagement and interpersonal trust.[3] Despite the appealing notion of reciprocal causality or virtuous circle, lack of relevant data (panel data with good measures) makes it difficult to test this hypothesis empirically.

Internet Use and Face-to-face Ties

In his sensational book *Bowling Alone*, Robert Putnam (2000) argues that the Internet has potential benefits for civic engagement and social connectedness but "will not automatically

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[3] He argues that "the relationships between the use of television, civic engagement, and interpersonal trust must be viewed as ore conditional—highly dependent on the type of programming under consideration and on audience members' uses of it" (p.490).

offset the decline in conventional forms of social capital" largely due to the social inequality (digital divide) of access to cyberspace, inability to transmit as much nonverbal and in-depth information as in face-to-face communication, and "cyberbalkanization" against diversity and heterogeneous communications (pp. 174-180). Putnam appears to have skeptical eyes on computer-mediated-communications and think Internet use is not as effective as face-to-face communications in nourishing classical social capital like face-to-face ties (as opposed to online engagement and connectedness).

While researches on political and social involvements are abundant, non-political and non-electoral face-to-face ties have less studied. Wellman et al. (2001) analyze about 40 thousands visitors to the National Geographic Society Web site and conclude that "Internet use supplement network capital by extending existing levels of face-to-face and telephone contact." Zhao (2006) differentiates between social Internet use and nonsocial use in the 2000 General Social Survey (GSS) data to illuminate their distinct impact on social ties (staying in contact with friends and relatives by face-to-face encounter, telephone, and other methods). She finds a significant positive effect of social Internet use and heavy email use, and then concludes that the impact of Internet use on social ties "depends on the type of online activities in which users engage and the amount of time they spend on these activities" (p. 585). Although examining the diversity of Internet use in cross-sectional data, her approach loses much information by dichotomizing email, WWW, and two-way communications (e.g., use of bulletin boards and chat rooms), and light versus heavy users.[4]

The Internet and television share many similarities. The Internet has many services just as television has many channels. The former provides a variety of contents in various formats and

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[4] In fact, three types of Internet use are not mutually exclusive. Most email and WWW users overlap and most two-way communications users use WWW since WWW has integrated Internet services (e.g., email, Usenet, and FTP) and many new Internet applications (e.g., online game and broadcasting) are developed on the basis of WWW.

the latter has diversity of television programs. However, the Internet and television differ in the mode of communications; television is one-way but the Internet supports two-way communications. Like TV channels and programs, types of Internet services (supply side) and modes of Internet use (demand side) need to be differentiated from each other (Park, 2007: 45-51). Stromer-Galley (2000) distinguishes computer mediated human interaction, "prolonged interaction between two or more people through the channel of a computer network" (Human↔Computer↔Human), from media interaction occurring between users and the medium itself (Human↔Computer) (Stromer-Galley, 2000: 117-119) and then argues that civic engagement is associated with the computer mediated human interaction rather than media interaction.[5] Similarly, Weiser (2001) classifies primary reasons to use the Internet into "socio-affective regulation" and "goods-and-information acquisition" and finds that two types of Internet use respectively have negative and positive effects on psychological well-being.

As Bimber (2001), DiMaggio et al. (2001), and Norris (2000) point out, causality between the Internet and civic engagement needs to be carefully examined. Internet use may influence face-to-face ties but the reverse may be true; they may reciprocal or jointly determined. People use the Internet to arrange meetings with others and personal ties in turn may facilitate use of the Internet. However, empirical tests of this causal structure are limited by availability of relevant data. Most data are not longitudinal but cross-sectional, devoid of various types of Internet use and civic engagement, and often having binary measures. Even nationwide survey

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[5] Computer mediated human interactions occur in two-way communication channels such as online forums, chat rooms, and e-mail. Online radios and chat rooms are real-time two-way human interaction tools that are constrained by time. Media interaction includes surfing the WWW through hyperlinks, downloading various files, filing taxes, placing orders online, listening to music, watching video clips, and playing games. Technically speaking, media interaction is two-way, but some interactions (e.g., page viewing and downloading files) are recognized as one-way communications from human's standpoint.

data such as the Current Population Survey and American National Election Studies are not exceptions.

This paper considers one type of civic engagement, face-to-face engagement, and examines three questions. First, has there been any significant change in face-to-face ties for the past four decades? If there is sharp decline, in particular after the middle of the 1990s, it is possible to suspect the Internet (or others) as a culprit of the change. Otherwise, why are we bothered with the relationship between the Internet and face-to-face engagement? Second question asks if types of Internet services matter in face-to-face ties. This paper considers the number of hours spent sending and answering emails and using WWW. Although most people use both emails and WWW, emails are generally used to communicate with others. If the amount of time spent for emails and WWW is negatively related to face-to-face ties, the Internet may have time displacement effect. Finally, I will examine if purposes of Internet use make difference in this type of engagement by contrasting deliberation or information seeking (e.g., news and government information) with entertainment (e.g., listing to music and playing online games). Emails and deliberative use of WWW are expected to be more associated with face-to-face ties than Internet use for entertainment.

Data and Methods

This study employs the General Social Survey data from 1972 through 2010 to analyze the trends of face-to-face ties. For statistical models, 2000, 2002, and 2004 data are used to examine the association of Internet use and face-to-face engagements. Like television, the Internet became pervasive in American society in 10 years after Web browsers are first introduced to the public in the middle of the 1990s. Figure 1 shows that Internet penetration has exploded from about 15 percent in 1995 to 50 percent in 2000 and then exceeded 70 percent in

2006.[6] Therefore, it is timely to evaluate the effect of the Internet on its mature stage of the 2000s.

[Figure 1 about here]

Three groups of face-to-face ties are considered. The first group includes spending a social evening with relatives, neighbors, and friends, and going to a bar or tavern.[7] Seven categories of each variable are recoded to have a range of 0 (none) through 1. The second group of dependent variables is the number of friends and relatives who a respondent stays in contact with at least once a year by face to face encounters, telephone, U.S. postal mail (cards and letters), and meetings or events (keeping in touch by email is also considered for comparison).[8] In each question except for the overall number of people in contact, eight categories are also recoded to have a range of 0 (none) through 1. Finally, the membership in voluntary organizations such as labor unions, service clubs, political clubs, and sports groups is examined.[9] Binary variables for sixteen organizations are summed up to measure the size of membership.

Key independent variables are types of Internet services and purposes of Internet use. I consider the numbers of hours per week that a respondent spends for email and WWW including Web surfing, chat rooms, bulletin boards, and others.[10] The purposes of Internet use are grouped

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[6] Text-based Internet services such as Telnet and FTP in CompuServe and Prodigy were widely used before WWW became popular in the later 1990s.

[7] The questions read, "How often do you spend a social evening with relatives?", "… with someone who lives in your neighborhood?", "… with friends who live outside the neighborhood?", and "… go to a bar or tavern?"

[8] The questions read, "Not counting people at work or family at home, about how many other friends or relatives do you keep in contact with at least once a year?", "Of these friends and relatives, about how many do you stay in contact with by seeing them socially, face-to-face?", "… by talking with them on the telephone?", "… by exchanging cards or letters through U.S. postal mail?", "… by seeing them at meetings or events related to church, clubs, or other groups?", "… by communicating through electronic mail?"

[9] The question reads, "Could you tell me whether or not you are a member of each type of organizations?"

[10] The question reads, "About how many minutes or hours per week do you spend sending and answering electronic mail?", "Not counting e-mail, about how many minutes or hours per week do you use the WWW? (Include time you spend visiting regular web sites and time spent using interactive Internet services like chat rooms, Usenet groups, discussion forums, bulletin boards, and the like)." Zhao (2006) separates two-way communications (e.g., chat rooms

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into deliberation and entertainment. Deliberative purpose is the aggregate frequency of visiting

Web sites for education, work, news and events, government and political information, and

science, while Internet use for entertainment is for music and concerts, television and movies,

computer games, and humor.[11] Exploratory factor analysis with the VARIMAX rotation was

employed to get Alpha scores of .98 for deliberation and .74 for entertainment. Covariates

include education, family income ($1,000), number of children under the age 18, marital status

(married=1), age, residential area at the age of 16 (rural=1), gender (male=1), race (white=1),

attendance at religious services, and full-time work status (full-time=1). Because the Internet

became pervasive in the 2000s, time effect is ignored in the following analyses. Table 1

summarizes descriptive statistics of dependent and independent variables.

[Table 1 about here]

Analysis begins with depicting the long-term trends of face-to-face ties. Many researches,

largely due to lack of rich longitudinal data, skipped this step and failed to view the overall

picture. This trend analysis tells whether social capital and face-to-face ties, as contended by

many researchers, have really declined over time. In order to explore the association of Internet

use and face-to-face engagement, the ordinary least squares (OLS) fit the models for first and

second groups of face-to-face ties, and the negative binomial regression model for the

membership of voluntary organizations. Many zero counts in the number of memberships may

result in over-dispersion (unobserved heterogeneity) problem in count data models, calling for

special caution in modeling and interpretation.

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and bulletin boards) from overall WWW use. However, responds to two communications are not consistent probably because some people failed to differentiate simple WWW surfing and two-way communications services.

[11] The questions read, "In the past 30 days, how often have you visited a WWW site for news and current events?", "… for government information?", "… for political information?", "… for science?", "… for music and concerts?", "… for TV or movies?", "… for games you can play on your computer?", and "… for humor?"

Findings

Descriptive trend analyses suggest no significant change in social capital and face-to-face ties. Contrary to Putnam's (1995, 2000) charges, social capitals such as trustworthiness, helpfulness, and fairness, despite some fluctuation during the 1970s and 1980s, are fairly stable after the 1980s (Figure 2).[12] Likewise, Figure 3 illustrates consistent levels of spending social evenings with relatives, neighbors, friends, and going to a bar or tavern without any significant decline or jump from the 1970s through 2000s. Even after the Internet has been widely adopted in the globe after the end of the 1990s, these face-to-face engagements remain almost unchanged. The number of friends and relatives whom a citizen stays in contact with by face-to-face encounter, telephone, U.S. postal mail (cards and letters), and meetings or events does neither decline nor increase substantially, while keeping in touch by email is slightly and continuously increasing during 2000 through 2004 (Figure 4). The overall number of friends and relatives in contact are on average 21.23 in 2000, 30.81 and 26.17 for 2002 and 2004. Finally, the average number of organizations that a respondent get involved in 2004 is about 1.6, slightly smaller than overall average of 1.76 (Figure 5). But this difference is too small to indicate decline or increase in memberships after the 1990s. Internet penetration, as shown in Figure 1, jumped up during the late 1990s and reached a mature level of 70 percent in the middle of the 2000s, but GSS reports no salient change (decline) in social capital, in particular face-to-face ties during the same period.[13] Internet use does not really appear to crowd out face-to face engagements? Social capital appears to be highly stable and the causal relationship between Internet use and face-to-face engagements seems suspicious.

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[12] Of course, there is empirical evidence that electoral engagements like voting and trust in government have been declined in the United States (Putnam, 2000; Skopol, 2003; Verba, Scholzman, and Brady, 1995).
[13] According to Pew Internet and American Life Project, use of WWW and online news increased from 53 and 61 percent in 2000 to 67 and 72 percent in 2005, respectively.

[Figures 2, 3, and 4 about here]

Table 2 suggests that the Internet regardless of types of its services and modes of use (purposes) does not influence spending social evening with relatives, neighbors, and friends and going to a bar or tavern. Both email and WWW use, no matter whether they are deliberative or entertaining, are not significantly related to having social evenings and going to a bar. The negative sign of WWW use implies a time displacement effect, but its impact is not statistically significant. Married people are less likely to get along with friends in the evening and go to a bar. The older people are, the less likely they are to have social evening with others. People frequently attending religious services tend to have more social evening with relatives and are less likely to go to a bar or tavern. Education influences in the opposite way. White Americans and men are more likely to go to a tavern than their counterparts. These results are not surprising.

[Table 2 about here]

The impact of Internet use on staying in contact with friends and relatives is conditional (Table 3). Email use is positively related to keeping in touch by face-to-face, telephone, cards and letters, and meetings or events, while overall time spent for WWW has a negative effect. This result, although not consistently significant, implies a time displacement effect. Deliberative use of visiting Web sites of news and events, government and political information, and science is significantly and positively associated with staying in contact, while WWW use for entertainment (e.g., music and concerts, television and movies, computer games, and humor) is not. If the overall time spent on WWW alone were considered, the analysis, as Norris (1996) shows, would end up with significant time displacement effect of the Internet. Web surfing and

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entertainment on the Internet do not influence keeping in touch with friends and relatives at least once a year. As Wellman et al. (2001) report, the Internet appears to be effective when people are willing to look for information and make arrangements for keeping in touch with. Education and attendance at religious services are positively related to staying in contact with friends and relatives regardless of communication methods. White Americans are more likely to stay in contact than other ethnic groups (i.e., black, Hispanic, and Asian). Older people and those who lived in country or farm in their childhood (at the age of 16) prefer sending cards and letters or getting together at meetings or events.

[Table 3 about here]

Keeping in touch by email is similar to other ways of communications, but both deliberative and entertaining uses of WWW are positively related (first column in Table 4). Family income and time spent for sending and answering emails are positively associated, but full-time workers are less likely than their counterparts to use emails for keeping in touch with their friends and relatives. The overall number of friends and relatives that a respondent stays in contact with is also similar to other methods of keeping in touch (second column in Table 4). Time spent sending and receiving emails and deliberative use of WWW are positively related to the overall number of people in contact, but time for Web surfing and entertaining purpose of WWW use are not. This finding is consistent with Zhao (2006).

[Table 4 about here]

The number of organizations that a respondent are involved is an event count variable and thus modeled in the negative binomial regression model (third column in Table 4). Time

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spent for emails and WWW do not influence the membership, but deliberative use of WWW is positively related. The more educated people are, the more memberships in voluntary organizations they have. People who frequently attend religious services get involved in many voluntary organizations. Presence of many zero counts may produce an over-dispersion issue that is handled by a parameter Alpha in the negative binomial regression model. The chi-squared 45.79 is too large to reject the null hypothesis that the Alpha is zero (Alpha=.263, p<.000). Therefore, this heterogeneity should be dealt with properly to produce the reasonable prediction for zeros. Figure 6 illustrates how the model predicts zero counts and explains difference in averages of three groups of deliberative WWW users. Light deliberative users with less than the first quartile (Q1) hour are predicted to have more zero counts than other intermediate (Q1-Q3) and heavy users (greater than Q3). That is, they are more likely to have no membership than heavier users. Instead, their curve sharply declines afterward and has a thinner tail. By contrast, heavy WWW users for deliberation and information have fewer zero counts and its curve has a thicker tail to have more counts of membership than do lighter counterparts. These curves indicate that the average membership of heavy users is larger than those of intermediate and light deliberative users. Their average memberships are 1.65, 1.62, and 1.36, respectively.

[Figure 6 about here]

Discussion

Although Putnam (2000) warns decline in social capital in the United States, an analysis of GSS suggests that face-to-face engagements measured in spending social evening, people staying in contact with, and voluntary membership remained almost unchanged. No sharp slash

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or jump was observed before and after the late 1990s when the Internet penetrates American society rapidly.

Spending a social evening with relatives, neighbors, and friends are not influenced by Internet use regardless of whether they are email, WWW, or deliberative and entertaining purposes. Similarly, going to a bar or tavern is not significantly related to the Internet except for a marginal negative impact of WWW use when covariates are controlled. Emailing and deliberative use of WWW are positively related to the number of friends and relatives keeping in touch by face-to-face and meetings or events, while the time spent for WWW has the negative effect. The same result is found in staying in contact by conventional methods of telephone and U.S. postal mail (i.e., cards and letters). As expected, WWW use for entertainment does not matter. Likewise, the number of voluntary organizations involved is positively associated with deliberative use of WWW and not with email and WWW use for entertainment. Education and attendance at religious services influence the number of people keeping in touch and voluntary memberships. Therefore, the Internet is not necessarily a technology culprit of the decline in face-to-face ties but can be used to nourish the engagement under some circumstances.

This finding sounds odd in that there was no change in face-to-face ties, but the Internet, in particular deliberative use of WWW influences the number of people in contact and memberships significantly. How do we interpret this puzzle?

One possible explanation is that there is a dynamics among generations without any significant change in overall face-to-face ties. It is well known that younger generations use the Internet more frequently and actively than do their older counterparts. If younger generations were less interested in face-to-face ties than older generations but get more engaged probably due to Internet use, and, by contrast, older generations lost chances for face-to-face engagements

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due to change in living environments, the overall engagement may remain unchanged. This speculation, if correct, might imply a "generation displacement effect." However, Figure 7 and 8 reject this hypothesis. Average scores of social trust vary across generation group over time, while the scores of spending social evenings with relatives are relatively consistent regardless of time and generations (Figure 7). Similarly, Figure 8 shows similar patterns in social evenings with neighbors and friends, in particular of the young generation. Perceptions such as trustworthiness and fairness as institutional rules are stable and not easy to change, but face-to-face ties appear to be much more stable and have some strong inertia.

The findings appear to support reinforcement and normalization theories. When people use the Internet for communicate with others and information seeking, they are more likely to have high level of face-to-face engagement (Wellman et al., 2001). Otherwise, time spent for simple Web surfing, listing to music, and playing online games may be independent of or detrimental to such engagement. The Internet has been evolving into various shapes (e.g., digital convergence) and its social impact is not fixed but depends on how people use it effectively. Putnam (2000) concludes, "The most important question is not what the Internet will do to us, but what we will do with it" (p. 180). The Internet does not automatically destroy or nourish social capital and civic engagement. Therefore, we need to use the Internet as it is developed to improve the quality of human life and avoid misuse of the Internet. In this context, Levin (2004) puts, "The Internet cannot be faulted if civil society is irreparably weakened--we deserve the blame for our failure to act" (p. 96).

Conclusion

This study examines if Internet use crowds out or facilitates face-to-face ties by analyzing the cumulative General Social Survey data. Assumed is that the impact of Internet use varies according to types of Internet services and modes (purposes) of Internet use. GSS data show that face-to-face engagements measured in spending a social evening, friends, and relatives staying in contact with, and voluntary membership remained almost unchanged for the past four decades. No sharp slash or jump was observed before and after the late 1990s. Spending a social evening with relatives, neighbors, and friends are not influenced by Internet use regardless of whether they are email, WWW, or deliberative and entertaining purposes. Emailing and deliberative use of WWW are positively related to the number of friends and relatives keeping in touch with by face-to-face, meetings or events, telephone, and U.S. postal mail (i.e., cards and letters), while the time spent for WWW has the negative effect. Finally, voluntary membership is positively associated with deliberative use of WWW and not with email and WWW use for entertainment. The Internet is not necessarily a technology culprit of the decline in social capital but its impact depends how effectively people use for society and themselves. In order to make a decisive conclusion, future studies need more rich longitudinal data and sophisticated methods.

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Table 1. Descriptive Statistics of Dependent and Independent Variables

	N	Mean	Median	SD	Minimum	Maximum
With relatives	3,176	0.603	0.667	0.269	0	1
With neighbors	3,171	0.405	0.333	0.340	0	1
With friends	3,174	0.527	0.500	0.263	0	1
Go to a bar	3,174	0.250	0.167	0.290	0	1
By face-to-face	4,008	0.470	0.429	0.270	0	1
By telephone	4,013	0.472	0.429	0.244	0	1
By postal mail	4,011	0.318	0.286	0.300	0	1
By meetings	4,007	0.276	0.143	0.299	0	1
By email	4,009	0.238	0.143	0.283	0	1
Number of contact	4,068	27.656	15.000	42.204	0	500
Membership	1,301	1.650	1.000	1.884	0	13
Education (years)	7,313	13.535	13.000	2.890	0	20
Family income	7,313	22.954	27.500	7.630	.5	27.5
Children under 18	7,313	0.612	0.000	1.056	0	8
Married	7,313	0.482	0.000	0.500	0	1
Age (years)	7,301	45.335	43.000	16.693	18	89
Rural area	7,313	0.228	0.000	0.419	0	1
Gender (=male)	7,313	0.455	0.000	0.498	0	1
Race (=white)	7,313	0.793	1.000	0.405	0	1
Religious service	7,313	3.629	3.000	2.702	0	8
Full time work	7,313	0.543	1.000	0.498	0	1
Email (hours)	3,465	4.248	2.000	7.247	0	70
WWW (hours)	3,895	6.451	3.000	9.441	0	130
Deliberation	2,136	1.513	1.333	1.177	0	5
Entertainment	2,135	1.044	0.750	1.138	0	5

Source: General Social Survey (2000, 2002, 2004)

Table 2. Spending Social Evening with Relatives, Neighbors, and Friends

	Relatives	Neighbors	Friends	Go to a Bar
Education (years)	−.012 (.004)**	.001 (.006)	.002 (.004)	.018 (.004)**
Family income	.002 (.002)	−.002 (.002)	.005 (.002)**	.002 (.002)
Children under 18	−.004 (.009)	−.008 (.012)	−.035 (.008)**	−.008 (.010)
Married	.004 (.022)	−.055 (.030)+	−.093 (.020)**	−.098 (.024)**
Age (years)	−.003 (.001)**	−.002 (.001)*	−.007 (.001)**	−.006 (.001)**
Rural area	−.004 (.027)	.037 (.036)	−.048 (.024)*	.044 (.029)
Gender (=male)	−.020 (.020)	.014 (.027)	.012 (.018)	.068 (.021)**
Race (=white)	−.022 (.026)	.018 (.035)	−.006 (.023)	.067 (.028)*
Religious service	.014 (.004)**	−.001 (.005)	.006 (.003)	−.017 (.004)**
Full time work	.018 (.022)	−.077 (.030)*	−.029 (.020)	.021 (.024)
Email (hours)	−.001 (.001)	.003 (.002)	.001 (.001)	.001 (.002)
WWW (hours)	−.001 (.001)	−.002 (.002)	−.001 (.001)	−.003 (.001)*
Deliberation	.004 (.010)	.026 (.013)+	−.004 (.009)	.002 (.011)
Entertainment	−.006 (.010)	.009 (.013)	.010 (.009)	.008 (.010)
Intercept	.834 (.077)**	.529 (.103)**	.780 (.068)**	.263 (.082)**
N	629	629	630	629
F	3.234**	2.201**	13.909**	12.025**
R^2 (adjusted R^2)	.069 (.047)	.048 (.026)	.240 (.223)	.215 (.197)

Source: General Social Survey (2000, 2002, 2004)
* Standard error in parentheses: + p<.10, * p<.05, ** p<.01.

Table 3. Staying in Contact with by Face-to-face, Telephone, Postal Mail, and Meetings

Contact with	By Face-to-face	By Telephone	By Postal Mail	By Meetings
Education (years)	.014 (.003)**	.013 (.002)**	.015 (.003)**	.008 (.003)**
Family income	.002 (.001)+	.002 (.001)+	.001 (.001)	.002 (.001)
Children under 18	−.010 (.006)	−.009 (.006)+	−.002 (.007)	.000 (.007)
Married	.018 (.014)	.021 (.012)+	.054 (.015)**	.001 (.015)
Age (years)	−.001 (.001)+	−.000 (.000)	.003 (.001)**	.002 (.001)**
Rural area	.028 (.016)+	.003 (.015)	.030 (.018)+	.054 (.018)**
Gender (=male)	−.020 (.013)	−.027 (.012)*	−.093 (.014)**	.009 (.014)
Race (=white)	.114 (.017)**	.072 (.015)**	.099 (.018)**	.044 (.018)*
Religious service	.013 (.002)**	.010 (.002)**	.017 (.003)**	.037 (.003)**
Full time work	−.037 (.014)**	−.030 (.012)*	−.021 (.015)	−.026 (.015)+
Email (hours)	.002 (.001)*	.002 (.001)*	.002 (.001)*	.002 (.001)+
WWW (hours)	−.002 (.001)*	−.001 (.001)+	−.002 (.001)*	−.003 (.001)**
Deliberation	.017 (.006)**	.024 (.005)**	.026 (.007)**	.015 (.007)*
Entertainment	.006 (.006)	.005 (.005)	.004 (.007)	.009 (.006)
Intercept	.122 (.048)*	.163 (.043)**	−.200 (.053)**	−.150 (.052)**
N	1,720	1,722	1,721	1,720
F	12.528**	12.068**	22.736**	23.593**
R^2 (adjusted R^2)	.093 (.086)	.090 (.083)	.157 (.150)	.162 (.155)

Source: General Social Survey (2000, 2002, 2004)
* Standard error in parentheses: + p<.10, * p<.05, ** p<.01.

Table 4. Staying in Contact with by Email, Overall Number Staying in Contact, and Membership

	Contact by Email	Staying in Contact	Membership
Education (years)	.019 (.003)**	1.298 (.453)**	.078 (.017)**
Family income	.003 (.001)**	.101 (.191)	.002 (.007)
Children under 18	−.012 (.006)*	−1.458 (1.085)	.012 (.045)
Married	.001 (.013)	2.406 (2.384)	.086 (.089)
Age (years)	.001 (.000)	.157 (.087)+	.007 (.003)*
Rural area	−.001 (.016)	4.119 (2.834)	.131 (.099)
Gender (=male)	−.026 (.012)*	−4.032 (2.250)+	−.021 (.085)
Race (=white)	.109 (.016)**	16.871 (2.874)**	−.033 (.112)
Religious service	.011 (.002)**	1.948 (.429)**	.114 (.016)**
Full time work	−.058 (.013)**	−4.314 (2.401)+	−.100 (.092)
Email (hours)	.005 (.001)**	.299 (.138)*	.006 (.004)
WWW (hours)	−.000 (.001)	−.072 (.127)	−.009 (.005)
Deliberation	.041 (.006)**	3.440 (1.052)**	.189 (.038)**
Entertainment	.016 (.006)**	1.233 (1.041)	−.008 (.038)
Intercept	−.164 (.047)**	−22.333 (8.397)**	−1.634 (.331)**
N	1,723	1,735	525
F (Chi square)	28.650**	9.084**	137.066**
(Pseudo) R^2	.190 (.184)	.069 (.061)	.069
Likelihood ratio			−925.865
Alpha			0.263

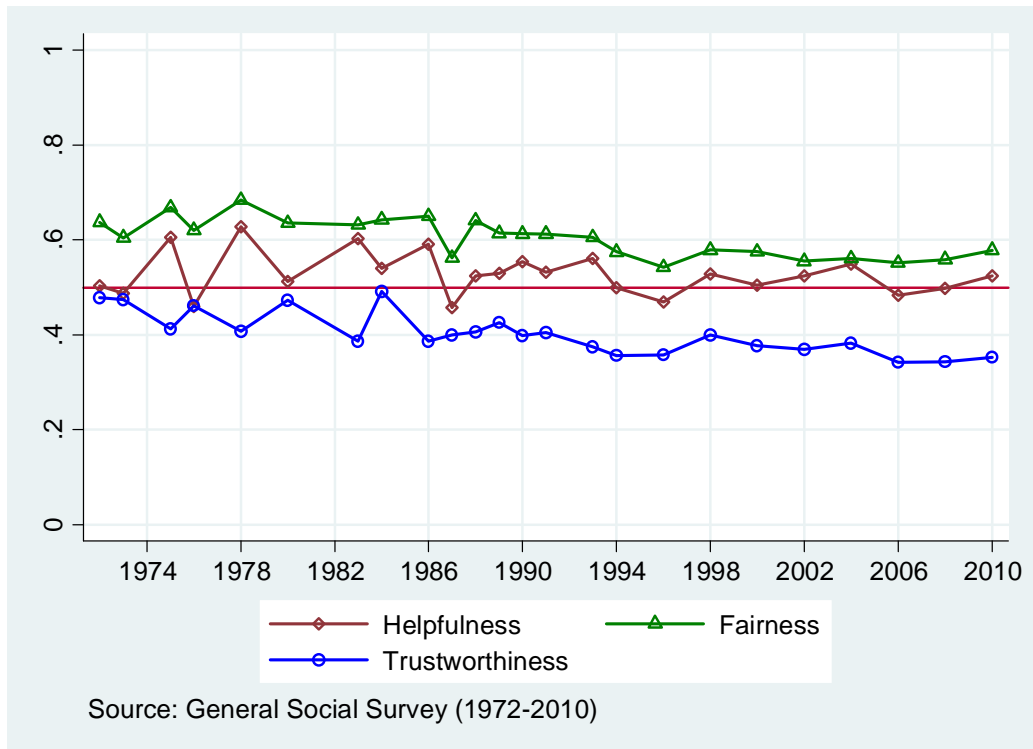Source: General Social Survey (2000, 2002, 2004)
* Standard error in parentheses: + p<.10, * p<.05, ** p<.01.

Figure 1. Internet Adoption (Penetration)
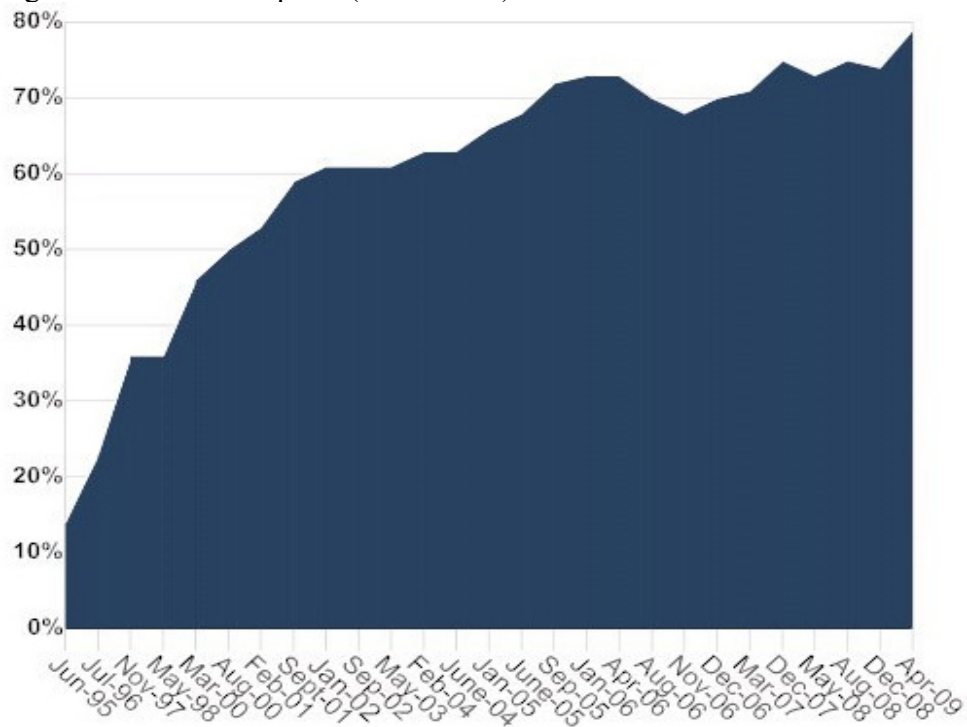
Source: Pew Internet and American Life Project

Figure 2. Trends in Social Helpfulness, Fairness, and Trust

Source: General Social Survey (1972-2010)

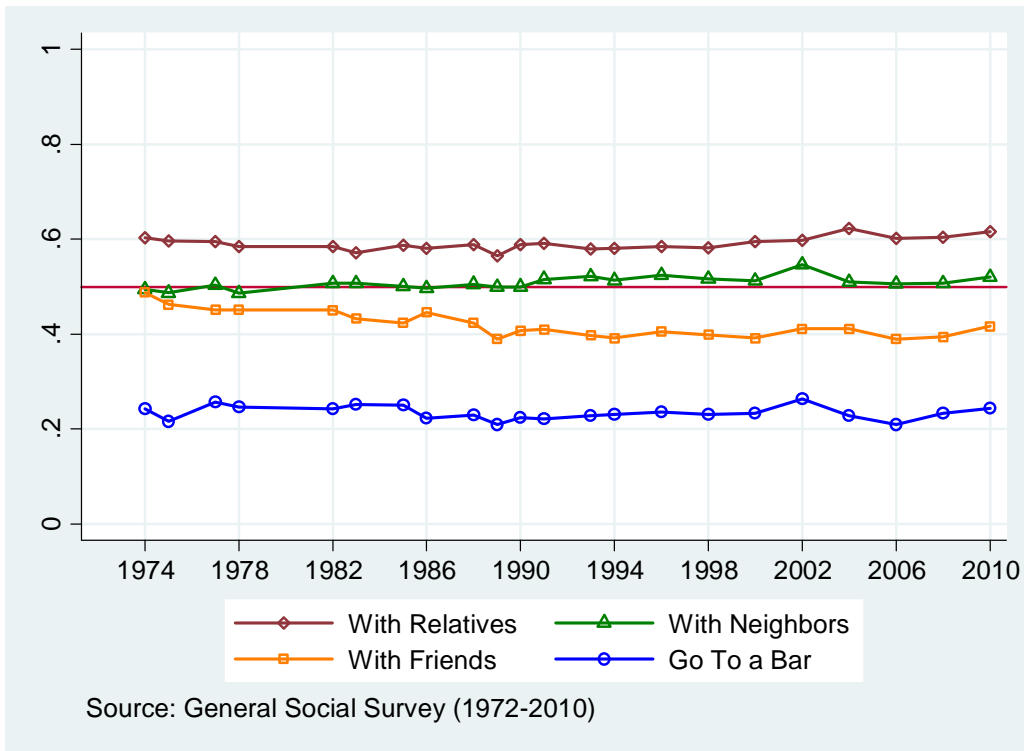Figure 3. Trends in Spending Social Evening and Going to a Bar

Source: General Social Survey (1972-2010)

Figure 4. Trends in Friends and Relatives who a Person Stays in Touch With

Source: General Social Survey (2000-2004)
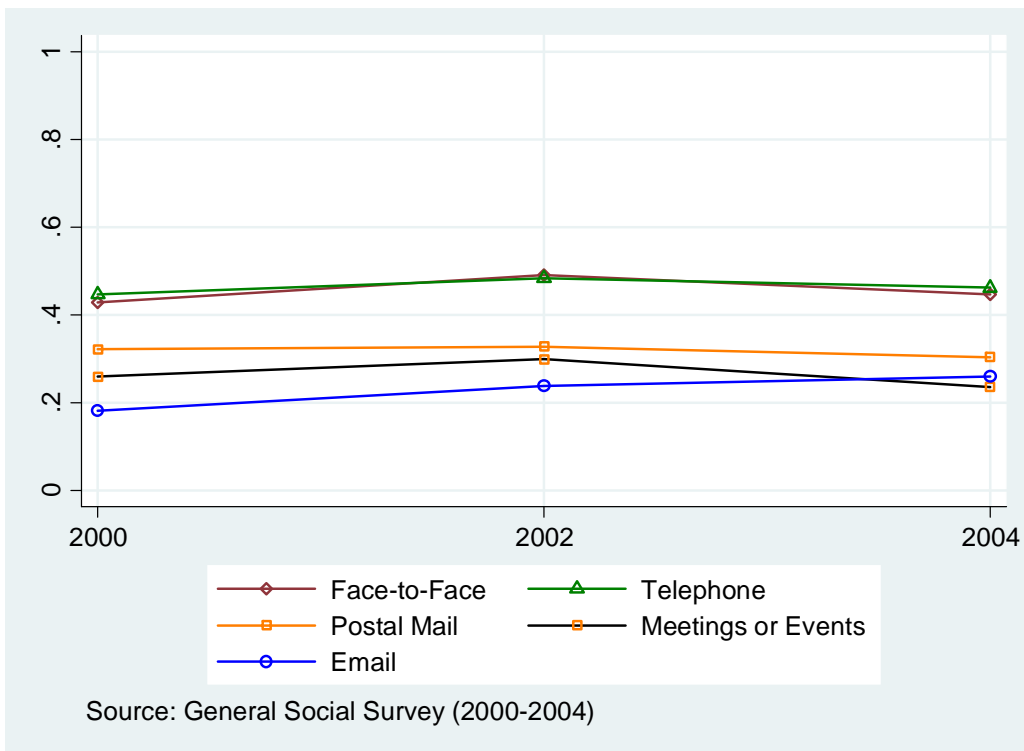
Figure 5. Trends in the Number of Memberships

mean 1.765

Average Number of Memberships

Source: General Social Survey (1972-2010)
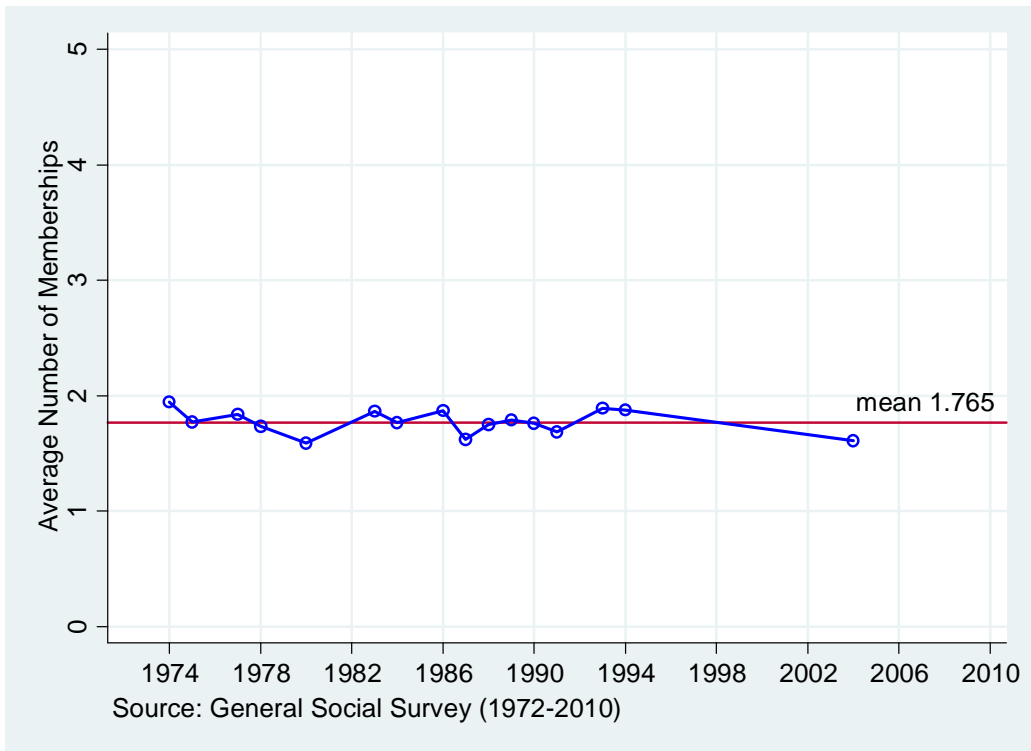
Figure 6. Predicted Probabilities of the Number of Memberships

Predicted Probabolity P(y=k)

Number of Memberships

Light Deliverative   Intermediate Use
Heavy Deliverative

Source: General Social Survey (2004)
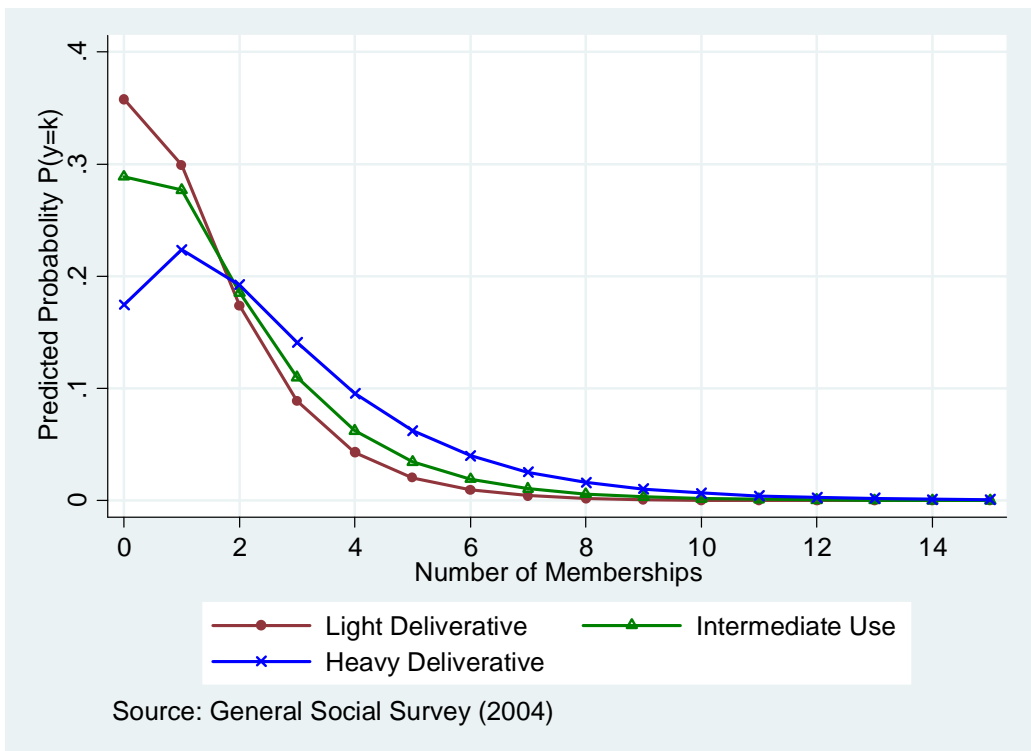
Figure 7. Trends of Social Evening with Relatives and Social Trust by Generations
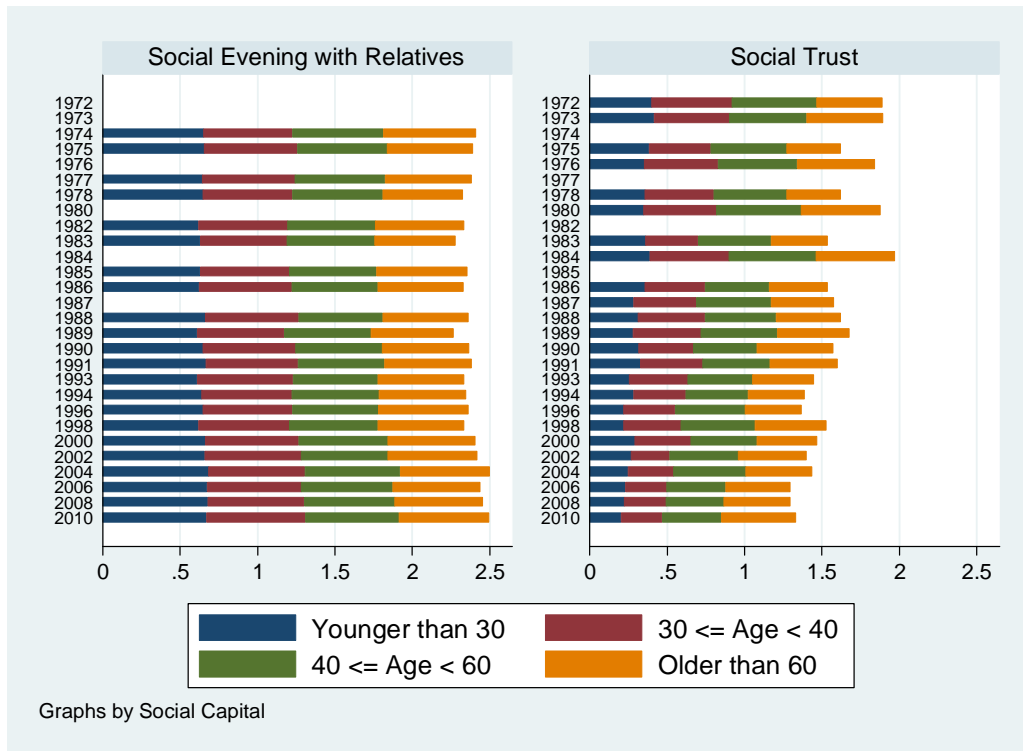

Graphs by Social Capital

Figure 8. Trends of Social Evening with Neighbors and Friends by Generations

Graphs by Social Capital