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Mobile communication and social capital: an analysis of geographically differentiated usage patterns

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Abstract

Drawing from a representative sample of adults in the USA, this study explored the links between mobile communication and select indicators of social capital, while also accounting for usage patterns regarding the proximity of mobile contact. Overall, the findings show that mobile phone use intersects with proximity in distinctive ways that are related to spending leisure time with others in a face-to-face context and being active in organized groups and clubs. For individuals with primarily local usage patterns, both voice calling and text messaging were positively associated with social leisure activity. For those who primarily used the mobile phone to contact others from a distance, text messaging was positively related to social leisure activity, and for those whose mobile contacts were balanced between local and distant, voice calling was positively associated with active membership in organizations. Interpretation of these findings and directions for future research are offered in the discussion.

Key words

glocal, mobile communication, mobile phone, networked individualism, social capital

With subscriptions well into the billions worldwide and growing, the social implications of mobile telephony are both profound and far-reaching. Use of the technology is transforming the social landscape by giving rise to new forms of coordination, relational expression and social connection (Ling, 2004). Without doubt, mobile communication

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has become a valuable resource for strengthening bonds among social network ties (Campbell and Russo, 2003; Ling, 2008). In fact, some argue that intense bonding through the technology can lead to tele-cocoons (Habuchi, 2005) and monadic clusters (Gergen, 2008), both concepts referring to small enclaves of like-minded individuals. According to Gergen (2008), the social privatism associated with this phenomenon can have negative consequences for involvement in the broader spheres of public life. Mobile telephony is also a highly personal technology that cultivates individuation. For example, mobile phones and their dialing numbers are associated with an individual user, as opposed to the shared nature of the domestic landline. In addition, the technology is carried, even worn, on the body, further incorporating it as part of the user's individual identity (Campbell, 2008; Katz, 2006; Katz and Sugiyama, 2005; Lobet-Maris, 2003). As Ling (2004) points out, the dynamics between social connection, social privatism and individuation raise important questions about the implications of mobile communication for social capital.

To help develop this line of inquiry, this study assessed the links between mobile communication and traditional forms of face-to-face social activity that, as social capitalists contend, help build and maintain a cooperative and mutually supportive society. In doing so, this investigation also accounted for the effect that local and distant mobile usage patterns have on the extent to which users engage with others and their communities. In recent years, social ties have been shifting from local involvement with proximal others to sparsely knit network connections that help bridge, if not redefine, space and time (Castells, 2000). Mobile communication plays an important and distinctive role in this trend, which Wellman (2002) characterizes as networked individualism, because it allows for connection virtually anytime, anywhere with network ties. Indeed, 'mobile communication deepens and extends the logic of networked individualism' (Castells et al., 2007: 97). While networked individualism opens up new opportunities for social connectedness with distant others, it may also have implications for traditional forms of face-to-face engagements that foster interpersonal trust and community.

This study draws from a nationally representative survey of adults in the USA to examine how patterns of mobile communication, differentiated by proximally bound and unbound usage, predict first spending leisure time with co-present others; and second, being active in organized groups and clubs. Conducted in 2005, the survey was among the first national studies of mobile communication in the USA, reflective of a time when the technology had just reached critical mass and shortly after Robert Putnam's (2000) account of declining social capital in American society. While this particular population at this particular point in time may not provide firm ground for generalizations to the larger world today, it is helpful for extending Putnam's inquiry into the effects of the media on activities that cultivate social capital. It is noteworthy that Putnam's analysis in *Bowling Alone* (2000) ends with the 1990s, prior to the mobile phone's emergence as an everyday social resource for most individuals in the USA. Therefore, this period shortly after *Bowling Alone* is timely for gaining insights into the initial social capital implications of mobile communication, while laying the groundwork for comparison with trends of today.

Putnam defines social capital as 'features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit' (1995: 67). In other words, social capital is a constructive by-product of connectedness and collective activity. Research and theory in this area have established that both

informal and formal social engagement can cultivate social capital. Informal engagement includes socializing with friends and family, neighborliness and spending leisure time with others, while more formal dimensions include various forms of civic and political involvement, such as voting and participation in organized groups and clubs (Coleman, 1990; Kwak et al., 2004; Putnam, 1993, 1995). Empirical evidence suggests that social capital has been declining in American society over the last several decades, reflected in reduced levels of both the formal and informal dimensions of social life (Putnam, 1995, 2000). Putnam (1995, 2000) points to the privatization of leisure time as a contributing factor, with particular emphasis on television viewing. He speculates on both the promise and peril of the internet, but his empirical evidence primarily draws from trends that precede the new media environment of the new millennium. This study extends his analysis by examining how select mobile communication patterns are associated with social activities that cultivate social capital, in the time period shortly following his study of the USA.

Mobile communication lowers the threshold for interaction and provides new opportunities for instrumental and expressive communication, which may offer important consequences for involvement in peer groups. By mitigating constraints of space and time (Ling and Campbell, 2009), the technology offers heightened flexibility for the nuanced coordination of social activities and maintaining personal relationships. Indeed, mobile phone users have come to regard the technology as a critical resource for making plans with others and filling in the gaps between face-to-face contact (Ling, 2004; Ling and Yttri, 1999, 2002). While incessant use may raise concerns that it can replace traditional forms of socializing with others (Gergen, 2008), this is not well supported in the research (Ishii, 2006). In fact, Wellman et al. (2003: para. 66) argue that the mobile phone and other new media are 'adding on to other means of communication rather than substituting for them'. Drawing from the research in this area, we hypothesize a positive relationship between mobile communication and spending leisure time with others in face-to-face settings.

> **Hypothesis 1 (H1):** Mobile communication, in the forms of voice calling and text messaging, will be associated with higher levels of spending leisure time with co-present others.

With regard to involvement in organized groups and clubs, there is a substantial body of related work on the media's influence on community and civic involvement. Much of this research has examined traditional mass communication channels such as newspapers, radio and television, with varying results, namely that informational uses of the mass media tend to yield positive associations with community and civic engagement, while many (although not all) entertainment uses are thought to detract from it (Besley, 2006; Cappella et al., 1997; McLeod et al., 1996, 1999; Norris, 1996; Shah, 1998; Shah et al., 2001b; Sotirovic and McLeod, 2001). Some of the early research on internet use indicated that time spent online can have negative effects on community by causing social isolation (Kraut et al., 1998; Nie and Erbring, 2000), but many of these findings have either dissipated or been refuted in follow-up studies (Kraut et al., 2002). Furthermore, others have found that the internet offers new opportunities for community building (Hampton and Wellman, 2001; Rheingold, 1993; Wellman et al., 2002) and civic engagement (Shah et al., 2005; Shah et al., 2001a, 2001b). Shah et al. (2005) attribute these findings to the flexibility the internet affords for accessing and exchanging information, viewpoints and content pertaining to shared interests.

As for the heightened flexibility of mobile telephony, it is reasonable to expect similar trends for this technology as well. Because mobile communication loosens constraints of both time and space, users are presumably better able to fit voluntary organizational activities into their daily lives and better equipped to carry out those activities. Furthermore, mobile communication provides another dimension of flexibility by allowing users to talk about community and organizational matters with others, in addition to textual exchange and information retrieval. Although research in this area is thin, the relevant work thus far indicates that mobile communication can play a positive role in community life, organizational membership and civic engagement (Campbell and Kwak, forthcoming; Ling et al., 2003). Drawing from these studies as well as those on internet access and use, we anticipate that mobile communication will be positively associated with being active in organized groups and clubs.

Hypothesis 2 (H2): Mobile communication will be associated with increased levels of involvement in organized groups and clubs.

As for the effects of networked individualism, that is, the shift from little boxes of proximal relations to dispersed network connections (Wellman, 2002), we anticipate that accounting for local and non-local mobile communication patterns will reveal differential patterns in levels of face-to-face social engagement. Of course, some individuals are connected both inside and outside their local community. Wellman describes this group as being glocal, melding the words global and local. Not to be confused with other uses of the term (such as in the globalization literature), these individuals are, in a sense, a hybrid of those in little boxes (geographically speaking) and networked individualists. However, the concept of glocal has another dimension as well, in that these types of individuals are also frequently on the move, traveling to various places that serve as home bases for social activity and work life (Hampton, 2001; Wellman, 2002). Wellman explains that in this glocal group, 'People go from some*where* to some*where* to talk to some*one* … Or people telephone some*where* to talk to some*one*' (2002: 14, emphasis in original). Because of their qualitative differences in how, where and with whom people are socially connected, these groups are proposed as ideal types or epitomic categories (Wellman, pers. comm. 5 December 2008). Therefore, we examine the links between mobile communication and social capital within each category of user rather than across them as a continuum. For the purposes of this study, the indicator used was one's proportion of local and non-local mobile contact. To be sure, proximity alone does not fully capture the nuances of local, glocal and networked individualism, and therefore it must be regarded as a bounded indicator of these tendencies.

Mobile communication tends to complement and even foster face-to-face contact with social ties, which provides a basis for speculating about the links between using the technology and face-to-face leisure activity in the different usage categories. Despite their differences of geography, those in little boxes and those who are networked individualists are similar in that both primarily engage in direct personal contact. In the case of the former, individuals are directly connected within neighborhood boundaries, while in the case of the latter they are geographically dispersed but still directly connected to others through information and information and communication technologies (ICT).

Glocal individuals, however, are distinct in that they are also connected to places through both travel and ICT. Considering mobile communication is primarily a person-to-person channel, we anticipate it to be particularly useful for supporting social leisure activity for members of those groups involved in person-to-person connections, as opposed to person-to-place.

> **Hypothesis 3 (H3):** Associations between mobile communication and spending leisure time with others will be significantly stronger for those with predominantly local and distant usage patterns than for those in the glocal category.

There are reasons to anticipate categorical differences among associations with involvement in organized groups and clubs as well. In this case, mobile communication would seem to be an especially useful organizational resource for individuals in the glocal group, considering the breadth of their local and non-local attachments and the social affordances of the technology. Compared with the other categories, glocal individuals are characteristically broad in that their members are connected to proximal and distant others, as well as places. Presumably, their interests in social organizations are broader too, through engagement in local activities as well as those not tied to their immediate surroundings. The mobile phone caters to this profile, not only in the sense that it is both a local and long-distance technology, but also because it can be used for contact with places that serve as hubs of organizational activity, such as offices, headquarters, and event and meeting sites. The virtual anytime, anywhere nature of the technology seems a particularly valuable affordance for these individuals, in order to stay connected and make plans – with people and places – while at home, commuting or traveling great distances. For these reasons, we anticipate it to be a more useful resource for individuals in the glocal group to stay connected to and active in social organizations.

> **Hypothesis 4 (H4):** The relationship between mobile communication and involvement in organized groups and clubs will be significantly stronger for glocal users than for those in the other usage categories.

Method

Data

This study was conducted through secondary analysis of a nationally representative dataset collected by the University of Michigan in a survey exploring the role of mobile communication in adult American life (University of Michigan, 2006). The survey was conducted by Schulman, Ronca, and Bucuvalis, Inc., using their computer-assisted telephone interviewing facilities. Results are based on a probability sample of 849 respondents, which reflects a 53 percent cooperation rate.[1] Of the respondents (N = 587), 69.1 percent responded that they personally had a cell phone or other wireless device for making and receiving phone calls, and all analyses reported were conducted among these mobile phone users. Interviews were conducted in the spring of 2005 with a randomly selected adult aged 18 years or over in each household, following a procedure developed by Rizzo et al. (2004). Each household was first contacted, and an adult of the household

was chosen for the survey. If there was more than one adult in the house, the telephone interviewing system randomly chose one adult member for the interview. The sample consists of 53.5 percent female and 46.5 percent male respondents, with an average age of 48.1 years (*SD* = 16.9). Median education level was 'some college' (response options ranging from 'less than high school' to 'post-graduate work or graduate degree'), and median household income was $30,000–49,999 (other response options: less than $30,000, $50,000–74,999 and $75,000 or more). Of the respondents, 72 percent were white, 10 percent African American, 5 percent Hispanic, 2 percent Asian or Pacific Islander, 2 percent American Indian/Native American, and the remainder either reported 'other' or did not report race.[2]

Criterion variables

Previous research has treated social capital as having multiple and various dimensions (Coleman, 1990; Kwak et al., 2004). The current study employed two dimensions of social capital, spending leisure time with/around others and membership in organized groups/clubs, which were drawn from a factor analysis of six dichotomous items (principal components extraction method with direct Oblimin rotation), that produced a factor structure consisting of the two dimensions. These aspects of social capital have both been linked to political knowledge, interest and participation (Brehm and Rahn, 1997; Putnam, 1993; Verba et al., 1995).

Group/club involvement This is comprised of two items that are concerned with participation in organized groups and clubs. Respondents were asked whether they belonged to and participated in the following at least once a month: 'an activity group or club such as a knitting group, a bridge club, a service club such as Lions, PTA, etc.' (21% yes); and 'an organized club or membership organization' (27% yes). Responses to the two dichotomous measures were added to form an index (inter-item correlation = .36, $p < .001$, $M = .56$, $SD = .74$).

Social leisure activity Four dichotomous items loaded on social leisure activity, which refers to spending time with or around others in a social setting, were added to form the variable (*KR20* = .49; $M = 2.16$; $SD = 1.06$). Respondents were asked whether they did the following activities with their free time at least once a month: 'Eat a meal with others in a restaurant' (80% yes); 'Meet friends for informal socializing' (77% yes); 'Play a team sport for fun' (15% yes); and 'Go to the movies/theater/a concert' (43% yes).

Mobile communication

Two measures were created to tap respondents' mobile communication practices: voice calling and text messaging. For voice calling, respondents were asked how many times on the previous day they had used the cell phone to call and to receive private calls from others. The numbers of voice calls made and received were then summed, with the additive measure ranging from zero to more than 20 ($M = 4.6$; $SD = 5.7$). The same procedure

was taken for text messaging. The text messaging variable, that is, the number of private text messages sent and received on the previous day, ranged from zero to more than 10 (M = .5; SD = 2.0), with about 9 percent of the respondents having text-messaged on the previous day at least once.

Geographically differentiated usage patterns

The usage categories for this study are grounded in the research and theory of Wellman and colleagues, as explained above. This variable was operationalized using items asking participants the distance of their last 10 cellular contacts. Participants who reported that seven or more were to persons within 25 miles were assigned to the local category (n = 328; 60.3% of mobile phone users), and those who reported seven or more were to persons more than 25 miles away were assigned to the distant usage group (n = 126; 23.2% of users). The remainder, who reported relative balance between local and distant, comprised the glocal group (n = 90; 16.5% of users). While this approach offers only one indicator of these concepts, it shares similarities with previous research of these groups that relied on proportions of network ties within or beyond 50 km (31 miles) (Hampton and Wellman, 2002).

Control variables

For demographics, this study controlled for the effects of age, sex, education, household income and race. These items were included as covariates because previous research shows they can have an influence on measures for social capital (Anderson, 1996; Shah et al., 2001a). Newspaper use and television news viewing were also included as control variables because past studies show these forms of media use can be related to social capital (Brehm and Rahn, 1997; Kang and Kwak, 2003; McLeod et al., 1999). Respondents were asked to report how much time they had spent reading a daily newspaper on the previous day, and the same question was also employed for their watching the news or any news program on TV. A 4-point scale, ranging from 'not at all' to 'one hour or more,' was used for both media use questions (M = 1.11; SD = 1.35 for newspaper use; M = 2.14, SD = 1.64 for television news use).

Analysis

To address H1 and H2, which concern the role of mobile phone use in social capital, a regression equation was run on each of the criterion variables with measures of mobile communication (i.e. voice calling and text-messaging) as main predictors. For H3 and H4, which attempt to investigate whether there are distinct relationships between mobile communication and social capital across the usage categories, analyses were performed in two stages. The first one was to analyze the relationship between mobile phone use and the criterion variables for each category. This portion of the analysis involved the same procedure as the one used for H1 and H2; however, it was conducted three separate times: once each for the local, distant and glocal groups. Serving as a preliminary test of the hypotheses, this approach would uncover to what extent the overall relationships

Table 1 Relationships between mobile communication and criterion variables for overall sample

	Social leisure activity		Group/club involvement	
	β	*t* -value	β	*t* -value
Control variables				
Age	–.21***	–3.86	–.10*	–1.85
Gender (high: female)	–.08	–1.63	–.06	1.19
Education	.05	.88	.19***	3.60
Race (high: white)	.06	1.21	.00	.01
Household income	–.02	–.41	.02	.36
Newspaper use	.19***	3.66	.17***	3.22
Television news use	–.02	–.42	14***	2.74
Mobile phone use				
Voice calling	.11*	2.19	.07	1.30
Text messaging	.10*	2.01	.06	1.20
R^2 (%)	10.2		10.8	

*p < .10. **p < .05. ***p < .01

between mobile communication and social capital remained in each usage category and thus reveal distinctive patterns of the relationships, if any, across them.

The second stage of the analysis for H3 and H4 was a direct statistical test of the hypotheses. Since H3 and H4 expect that the glocal group should be significantly different from the others in terms of the role of mobile phone use in social leisure activity and organized group/club involvement, we created two dummy variables for the three usage categories, with glocal being coded as an omitted category. Then, a total of four multiplicative interaction terms (two mobile phone use variables × two usage dummy variables) were constructed. A regression equation with the interaction terms and other predictor variables were run on the criterion variables, and the regression coefficient of each interaction term was analyzed to see whether the contribution of a mobile phone use variable was significantly greater or smaller for the local and distant user groups than for the glocal group in a respective regression equation. To reduce potential problems with multicollinearity between interaction terms and their components, all the component variables were standardized prior to the formation of the interaction terms (Cronbach, 1987; Jaccard et al., 1990; Kwak, 1999).

Results

Table 1 shows findings for H1 and H2. After a host of control variables that included demographic and media use measures were accounted for, use of the mobile phone for voice calling (β = .11; p < .05) and text messaging (β = .10; p < .05) was found to be significantly related to spending leisure time with co-present others, which supported H1. As for activity in organized groups and clubs (H2), neither voice calling nor text messaging was a significant predictor. Thus, the findings in Table 1 seem to indicate that when the contributions of traditional media measures as well as demographic variables are

Table 2 Relationships between mobile communication and social leisure activity for each proximity grouping

	Local		Glocal		Distant	
	β	*t* -value	β	*t* -value	β	*t* -value
Control variables						
Age	–.18**	–2.52	–.26*	–1.83	–.20	–1.58
Gender (high: female)	–.02	–.32	–.20*	–1.70	–.07	–.64
Education	.03	.38	.02	.18	.23*	1.73
Race (high: white)	–.00	–.04	.19	1.45	.15	1.22
Household income	.04	.52	–.20	–1.59	–.08	–.56
Newspaper use	.23***	3.39	.20	1.60	.12**	.98
Television news use	–.05	–.68	.02	.18	–.02	–.14
Mobile phone use						
Voice calling	.16**	2.31	.14	1.08	.00	.00
Text messaging	.16**	2.37	–.07	–.49	.20*	1.78
R^2 (%)	15.0		17.8		15.5	

*p < .10. **p < .05. ***p < .01

simultaneously considered, the significant relationship between mobile phone use and social capital (as treated in this study) is somewhat limited to social leisure activity.

In Tables 2 and 3, findings from a separate regression for each of the three categories of local, glocal and distant are presented.[3] Overall, the results in Table 2 suggest that the patterns of the relationships reported in Table 1 are not equally replicated in all three categories, and thus, as H3 and H4 predict, geographic proximity is an important factor that may help shape the role of mobile communication.

Findings in Table 2 show that the significant relationship between voice calling and social leisure activity demonstrated in Table 1 remained significant only among those whose usage was predominantly local, that is, with others who were within 25 miles (β = .16; p < .05). However, the more geographically distributed the usage, the weaker the relationship between voice calling and social leisure activity (glocal: β =.14; p < .30; distant: β = .00). Text messaging shows a different pattern. While the results in Table 1 indicate that this feature had a significant relationship with spending leisure time with others, findings in Table 2 suggest that text messaging may be an important component in bolstering co-present social engagement for individuals with local and distant usage patterns, which supports H3. According to the findings, text messaging was found to have a significant positive relationship with social leisure activity among those whose mobile contact was mostly local (β = .16: p < .05) or distant (β = .20; p < .08), though the latter is marginally significant. However, for the glocal users, with a more or less balanced mix of close and distant mobile contact, the relationship was insignificant (β = –.07; p > .60).

Table 3 shows findings from a series of regression analyses, with involvement in organized groups/clubs entered as the criterion variable. Voice calling, which was not a significant predictor when all respondents, regardless of their geographic usage pattern, were analyzed all together (Table 1), emerged strongly significant in the glocal group

Table 3 Relationships between mobile communication and group/club involvement for each proximity grouping

	Local		Glocal		Distant	
	β	*t* -value	β	*t* -value	β	*t* -value
Control variables						
Age	–.06	–.82	.06	.45	–.19	–1.58
Gender (high: female)	.08	1.24	.06	.56	.01	.87
Education	.12*	1.67	.31**	2.53	.28**	2.12
Race (high: white)	–.06	–.88	–.02	–.16	.09	.75
Household income	.00	.05	.03	.23	.02	.14
Newspaper use	.22***	3.21	.06	.49	.10	.85
Television news use	.07	1.00	.24*	1.89	.10	.88
Mobile phone use						
Voice calling	–.01	–.15	.27**	2.27	.10	.83
Text messaging	.08	1.16	.05	.37	.07	.67
R^2 (%)	9.5		28.6		16.5	

*p < .10. **p < .05. ***p < .01

(β = .27; p < .05), while for the other categories the relationship was either non-existent (local: β = –.01; p > .80) or weaker (distant: β = .10; p > .40). These findings, thus suggest that as H4 expected, voice calling via the mobile phone might facilitate engagement with organizational opportunities among those whose contacts are composed of both close and distant others, likely allowing them to be exposed to matters with both immediate and broad concerns. However, text messaging was not found to be significant in any of the three proximity categories examined.

Although the analyses reported in Tables 2 and 3 produced findings supportive of H3 and H4, they did not directly test whether text messaging is a stronger predictor of social leisure activity in the local and distant groups than in the glocal category (H3), and whether voice calling is a stronger predictor of group/club involvement in this category than in the others (H4). To test H3 and H4 directly, as shown in Table 4, interaction terms between dummy variables for the proximity groups and mobile communication measures were created and entered in a regression analysis for the criterion variables.[4] Of the interaction terms shown in Table 4, two terms (text messaging × local usage and text messaging × distant usage) are used for H3, and another two terms for H4 (voice calling × local usage and voice calling × distant usage). Because glocal was the omitted category for the proximity dummy variables, each interaction term tests the difference between it and each of the other two in the relationship between mobile communication and the criterion variable.

For H3 both interaction terms were found to be at least marginally significant. Supporting H3, the findings in Table 4 indicate that the contribution of text messaging in social leisure activity was greater in the local (β =. 10; p < .09) and distant (β = .28; p < .05) categories than in the glocal group. For H4, one interaction term, voice calling × local usage, was found to be significant (β = –.15; p < .05). Partially supporting H4, the finding indicates that

Table 4 Comparing the relationships between mobile communication and criterion variables across the proximity groupings: an interaction approach

	Social leisure activity		Group/club involvement	
	β	*t* -value	β	*t* -value
Prior blocks R^2 (%)	11.4		11.0	
Interaction terms				
Voice calling × local usage	.02	.36	−1.15**	−2.23
Voice calling × distant usage	−.05*	−.72	−.07	−1.12
Text messaging × local usage	.10*	1.72	.04	.75
Text messaging × distant usage	.28*	2.28	.08	.70

Prior blocks include age, gender, education, newspaper use, television news use, voice calling, text messaging, local usage dummy variable and distant usage dummy variable.
*$p < .10$. **$p < .05$

voice calling played a greater role in group/club involvement for those with glocal than local usage patterns. While in the hypothesized direction, the coefficient for the other interaction term, voice calling × distant usage ($\beta = -.07$; $p < .30$), was not significant.

Discussion

Beyond positive associations between mobile communication and social leisure activity for the overall sample, the findings reveal some interesting nuances within and across the different usage categories. Among the nuances are significant and positive links between text messaging and spending leisure time with others for individuals with predominantly local and distant mobile usage patterns. Despite the fact that text messaging is not a rich medium (Daft and Lengel, 1984, 1986), it is commonly appropriated for personal communication among strong ties (Ishii, 2006; Ling, 2004, 2008). Peers are known to use text messaging as a means of reinforcing friendship (Ito and Okabe, 2005; Johnsen, 2003; Ling, 2004). In other words, text messaging can be a highly personal form of interaction that fosters personal relationships, which might explain the positive and significant coefficients between it and social leisure activity for members of the two usage categories that primarily involve person-to-person connectivity (as noted previously, these include the local and distant usage groups). Certainly there is person-to-person connectivity for glocal individuals as well; however, that is only part of the picture for this type of user since they are also connected with and through places (Wellman, 2002). Our thinking here is that because text messaging supports person-to-person rather than place-to-place connectivity, it plays a more meaningful role as a tool for social leisure activity for individuals whose social connectivity more closely resembles little boxes and networked individualism than glocalization.

Another nuance in the findings is that voice calling is a significant predictor of participation in organized groups and clubs for the glocal category, but not for the other proximity groupings. Compared with informal social leisure activity, more organized forms

of social engagement often involve a broader range of interaction, with individuals being connected to organizations, acquaintances in those organizations and perhaps even strangers with whom they do not have ongoing contact. This type of involvement can be a bridging activity that fosters horizontal, new and organizational ties. The results of this study suggest that voice calling might better support this breadth of contact than does text messaging, particularly for the glocal users, who are characteristically broad in their types of connections. Glocal individuals are connected not only to other people, but to places as well. Furthermore, their ties are both local and geographically scattered and maintained through a combination of mediated and unmediated channels. Voice calling seems to suit this breadth in an organizational context by supporting contact with various others as well as places of organized activity. Text messaging, on the other hand, is more narrowly appropriated in that it is typically used only with people and not places, although this is technically possible in some cases. Furthermore, one can speculate that the texting reported in this study was primarily with known others, although we are unable to confirm that with these data.

It is also likely that mobile voice calling helps mitigate the loss of time that glocal individuals face while traveling from place to place. Putnam explains that time spent behind the wheel is 'demonstrably bad for community life. In round numbers the evidence suggests that *each additional ten minutes in daily commuting time cuts involvement in community affairs by 10 percent'* (2000: 213, emphasis in original). Because mobile telephony can be used to resurrect dead time (Ito and Okabe, 2005), it is plausible that the technology offers new opportunities for glocal individuals to stay engaged in voluntary organizations while commuting or traveling from place to place.

However, these conclusions must be qualified by the measurement of the glocal usage category, which only tapped into the spatial dimension of this concept with 25 miles as the delineation between local and non-local interaction. While a similar approach has been taken in previous research (Hampton and Wellman, 2002), it is not optimal for teasing out differences in what might be considered local among different types of individuals, such as those living in rural as opposed to urban areas. Future research will benefit from a set of more robust measures to more fully capture the concept of glocalization as well as the other forms of social connection.

Another important consideration in the findings is that the effects of age have not been accounted for other than serving as a control variable. Indeed, age plays an important role in the usage and social consequences of new media (Shah et al., 2001a), particularly the mobile phone (Ling, 2004). Therefore, we ran a series of post-hoc regressions that included age as an additional interaction term, as a continuous variable in one set of analysis and as lifecycle groups in another. In both cases, findings for the moderating effect of age yielded only one significant result: the positive relationship between text messaging and social leisure activity for the local group was amplified among younger users. Interestingly, no other interactive effects for age were found. The one significant finding here is most likely a reflection of younger individuals being on the forefront of using text messaging as a social resource and staying connected with friends with whom they spend time.

A next step in this line of research is to examine more contemporary mobile communication practices. Data for 2005 are timely for examining mobile communication and social capital trends in the period following Putnam's (2000) *Bowling Alone*; however,

these trends may have changed with rising adoption levels, more sophisticated devices and applications, and new uses of the technology for connecting with other individuals and community life. A follow-up study that employs a similar approach, while also examining other uses of the technology, will provide new insights as well as a means for comparison between patterns today and those in 2005. In addition to accounting for other uses of the technology, future research should also attempt to situate mobile communication in the larger media landscape. The results shed light on some potential implications of mobile communication for social capital. However, the shift from little boxes to networked individualism involves various forms of mediated contact. Therefore, greater understanding of the role of mobile communication in today's network society can be gained by examining the social implications of mobile technology in relation to other forms of networked interaction.

In addition to these avenues for research, further investigation is needed to ascertain the direction of the relationships uncovered in this study. Because the survey used for this study is cross-sectional in nature, the links between mobile communication and social capital must be interpreted as correlational. While the evidence suggests that mobile communication can support social capital, it is uncertain whether use of the technology in fact leads to increased engagement, or whether the causal arrow points in the other direction. Experimental approaches as well as multi-wave panel studies will help examine how changes in mobile communication are causally related to social capital indicators. Finally, this study is limited to adults in the USA[5] and follow-up studies should explore trends in other societies, as well as with individuals under the age of 18, who in their own ways have been pioneers of mobile communication practices.

Keeping these limitations in mind, this study offers new empirical evidence that certain patterns of mobile communication seem to support (rather than detract from) traditional forms of social activity that cultivate social capital. This study also illustrates that local and non-local usage patterns are a crucial element in understanding whether and how the technology supports them. Therefore, it is important for researchers to be mindful of this and other aspects of social context as they design and carry out additional studies on the opportunities and challenges of mobile communication for engagement in social life.

Notes

1 American Association for Public Opinion Research (AAPOR)'s Cooperation Rate Formula 1 was used to compute the cooperation rate.

2 For education ($M = 3.10$; $SD = 1.16$), response categories include: [1] less than high school; [2] some college/community college/vocational school; [3] college graduate; and [4] postgraduate work/graduate degree. For household income ($M = 2.41$; $SD = 1.11$), response categories include: [1] $29,000 or less; [2] $30,000–49,999; [3] $50,000–74,999; and [4] $75,000 or more.

3 This subgroup analysis was based on a small sample size for each network category, particularly for glocal ($n = 90$) and distant networks ($n = 126$). Because of obvious concern about Type II error, one should take care in interpreting individual coefficients in Tables 2 and 3. Accordingly, in discussing the findings, this study focuses mainly on patterns of findings across usage categories.

4 This approach, which included the entire sample in the analyses, essentially allows the same degree of statistical power for all three network categories, which was not the case in the analyses reported in Tables 2 and 3.

5 Because of institutionally imposed research limitations, only the adult population was sampled for this survey.

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