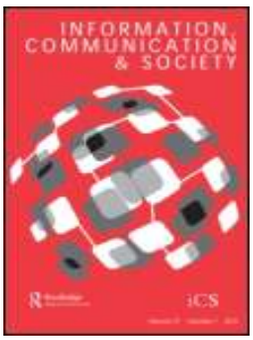

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A multimodal view of voluntary associations

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Participation in voluntary associations is often considered challenging due to the fact that humans possess limited time and resources that can be allocated to various types of social activities. The prevalence of multiple modes of communication in our everyday lives may signal the possibility of addressing such traditional problems of voluntary associations. Employing the framework of media multiplexity, this study investigates the factors that predict multimodal participation and how multimodal participation in turn affects overall involvement in voluntary associations. Analyses of the data gathered by the Pew Internet Report show that the degree of affiliations, prior experiences (including participation in online groups, online recruitment, and leadership), and routinized technology use were significant predictors of multimodal group participation. In addition, multimodal group participation mediated the effects of these factors on participation in voluntary associations. Together, multimodal participation and groups' multimodal organizing positively predicted the generation of group impacts. These findings illuminate a new way of understanding voluntary associations in today's media-saturated society.

Keywords: media multiplexity; mixed-mode relationships; voluntary associations; social capital; ecology

Beginning in the industrial age, voluntary associations such as clubs and ethnic associations became a haven for the emerging working class to seek cooperation and engage in activities sustaining traditional values (Anderson, 1971). Specifically, voluntary associations are characteristic of contemporary liberal democracies, and may even be vital to their survival (Babchuk & Booth, 1969; Clark, 1991; Lipset, Trow, & Coleman, 1956; Morris, 1986). Yet voluntary associations rely on most members' intermittent involvement rather than their continuous effort and attention (Smith & Reddy, 1973) and are maintained by means of part-time, unpaid activities (Kerri, 1972). Accordingly, these features reflect the fluid nature of voluntary associations, which often suffer from a lack of member commitment and lower priority than members' individual goals, as well as insufficient group size and resource base (Harris, 1998; Knoke & Prensky, 1984). The growing prevalence of various types of information and communication technologies (ICTs) signals a potential change in the way that people participate in voluntary associations. Indeed, the use of ICTs has made it relatively easy for people to build and maintain relationships, and to engage in social activity in different modalities (Katz & Rice, 2002; Wellman & Gulia, 1999; Wellman, Haase, Witte, & Hampton, 2001). Nonetheless, it is not clear whether and how technology use, especially multiple technology use, overcomes the fundamental issue

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inherent in voluntary associations, which is maintaining members' enduring investment in groups.

Voluntary associations, by definition, refer to 'groups of people who draw a boundary between themselves and others in order together to meet some problem or to do something' (Billis, 1993, p. 160). Because of this definition, the terms 'voluntary associations' and 'groups' are used interchangeably throughout this paper. Examples of voluntary associations range from informal and small-scale neighborhood associations, leisure groups, and hobby clubs to large-sized sports leagues, religious congregations, and supralocal groupings like professional and alumni associations. Voluntary associations have long been considered an important mechanism through which people build and maintain interlocking horizontal networks conducive to coordinated action (Putnam, 2000) as well as a way to produce public goods that benefit not only group members but also people outside of the group (Samuelson, 1954).

Members are the major source of sustaining a voluntary association, and because people have limited time and resources (and because each social entity in one's repertoire consumes time and effort), those entities tend to compete with each other at the aggregate level (McPherson, 2004). According to the ecology model of voluntary associations, a voluntary organization's relationships with other organizations are determined by the characteristics of its members such as education, age, and gender (McPherson, 1983). For example, hobby groups may easily have overlapping memberships with other voluntary groups because they appeal to members of a broader range of demographic characteristics (e.g. age, occupational status, gender) (McPherson, 1983). These member characteristics constitute the niche space which an organization occupies (McPherson, 1988). In this niche space, an organization is surrounded by other groups and organizations that will shape its growth or decline, changes in composition, and even its survival (McPherson & Ranger-Moore, 1991).

Yet as far as this ecology model (McPherson, 1983) is able to predict the dynamic process of the relationship among voluntary associations, the focus is limited to the organizational level, without attention to members' participation in these associations. Moreover, the possibility of incorporating technology use is overlooked, though it may change the way individuals participate in groups, the way groups organize activities, and the way groups are related to one another. If people are able to appropriate multiple technologies to participate in voluntary associations, they may better manage their engagement with the group. Thus the competition between groups in terms of acquiring members' time and effort may change as well.

On the other hand, systemic frameworks are prevalent when looking at individual action as embedded in a larger media and social environment. For example, media system dependency theory argues that mass media, individuals, interpersonal networks, and the social environment constitute an interrelated system in which each subsystem relies on the others to fulfill needs and achieve goals (Ball-Rokeach, 1985). The communication infrastructure model suggests that the communicative actions of individuals and networks of individuals are embedded in the meso-level structures (such as community organizations and local news media) as well as the macro-level structures (such as mass media at national or international levels) (Ball-Rokeach, Kim, & Matei, 2001). The theory of channel complementarity suggests that people use multiple media to satisfy their interest in a particular topic, such as politics or local community (Dutta-Bergman, 2004). Boase (2008) posited that individuals maintain their personal networks through use of multiple media, including email, mobile phones, and face-to-face contact.

These above frameworks place a theoretical emphasis on individual action without losing the relevance of the social context in which media use is embedded. These approaches also provide insights into the usefulness of communication multiplexity to facilitate social and organizational activities. In other words, individuals are motivated to use multiple means of communication to maintain interest about a topic (Dutta-Bergman, 2004) or to maintain social ties (Boase, 2008;

Haythornthwaite, 2005). Such a multimodal view offers a useful lens to understanding the patterns of participation in voluntary associations. When not face to face, people can use multiple other ways – such as email, Facebook, and listservs – to communicate with other group members and get informed about group activities. Thus they are more likely to stay in the group and become active. They are also likely to maximize their time and effort for different social activities.

Building on the specific assumption of the ecology model of voluntary associations which concerns individuals' constraints in participation (McPherson, 1983), the multimodal view proposed in this paper emphasizes the active nature of individuals as they decide how to participate in voluntary associations, including using technologies. This study identifies the factors that may influence individuals' multimodal participation, and examines the effect of multimodal participation on general involvement with voluntary associations. Along with multimodal participation, multimodal organizing by groups is also examined in relation to the generation of group impacts. Analyses of the data gathered by the Pew Internet and American Life Project are used to test these proposed patterns of multimodal participation and organizing of voluntary associations.

Media multiplexity and voluntary associations

The concept of media multiplexity refers to the patterns of communication based on the strength of ties (Haythornthwaite, 2005). The more frequently two people communicate, the stronger the tie, and the more types of media they use (e.g. face-to-face talk and email) (Haythornthwaite & Wellman, 1998). Strongly tied people also exhibit the tendency to take advantage of appropriate occasions for interaction in order to maintain those relationships (Haythornthwaite, 2005). Accordingly, the ability and the intention to use multiple technologies for networking are often associated with social accessibility (Yuan, Carboni, & Ehrlich, 2010), adaptability (Haythornthwaite, 2005), and individualized networking (Hsieh, 2012). Invariably, media multiplexity also represents the emergence of norms associated with technology use for communication (Haythornthwaite, 2002). If one channel of communication fails to reach the intended recipient, an individual will try other media based on the communication norms that have developed over time. Instead of focusing on the attributes of media or individual characteristics, the framework of media multiplexity emphasizes the context in which a medium is used (Haythornthwaite, 2002). In other words, it examines how media use is embedded into and interacts with a social collective's existing communicative practices (Orlikowski & Yates, 1994).

Applying the framework of media multiplexity in the voluntary association context, it is expected that individuals may be motivated to use multiple media to begin or maintain their relationship with the voluntary group. In this article, the pattern of using multiple media to participate in group activities is called multimodal participation, and the way groups use multiple media to organize activities is called multimodal organizing. In line with the ecology model of voluntary associations, the pattern of multimodal participation is based on the assumption that people possess limited time and resources. Hence, they tend to use multiple means of communication to engage in group activities to maximize their engagement with the group. Similarly, groups may increase their chances of encouraging members' involvement by providing multiple and flexible ways for members to participate.

In Haythornthwaite's (2005) conceptualization, compared to those with weak ties, strongly tied people frequently engage in multiple types of resource and information exchanges. Preference for a wider scope of exchanges facilitates media multiplexity. Just as the use of multiple media can depend on the strength of ties, individuals' multimodal participation with the group can be influenced by various factors, such as associational experiences, and the experience of using technology for collective activity. In the following section, drawing on the framework of media multiplexity

and related literature, hypotheses and research questions are developed to investigate the factors predicting multimodal participation and the outcomes of multimodal participation.

Media multiplexity and participation

Integral to the framework of media multiplexity is the process of individuals acquiring multiple technological resources in order to maintain their social relationships (Haythornthwaite, 2005). In this process, individuals may be driven by their prior experience and media habits, but they may also explore different options depending on what is available when engaging in collective activities. For example, it is likely that if individuals belong to multiple voluntary groups, they are more motivated to manage their participation in a particular group through communication multiplexity. In fact, those who were members of multiple groups were found to be more actively involved in civic participation (Almond & Verba, 1963; Kavanaugh, Reese, Carroll, & Rosson, 2005; Putnam, 2000; Verba, Schlozman, & Brady, 1995).

The literature has long observed that people show intermittent attention and commitment to voluntary associations (Harris, 1998; Knoke & Prensky, 1984; Smith & Reddy, 1973). The advantages of using different technologies – such as the website of the group, social networking websites, emails, and online discussion forums – let individuals participate in different groups concurrently, albeit in a partial way. According to social capital theory, by being members of multiple groups, individuals can acquire potential benefits from connections that bridge otherwise disconnected clusters or groups (Burt, 1992; Granovetter, 1973; Lin, 1999). As such, individuals predisposed to socially advantageous bridging positions may be more likely to use technological resources to acquire further networking benefits. On the basis of this possibility, it is hypothesized that individuals belonging to more groups are more likely to engage in multimodal group participation.

H1: Individuals with more group affiliations are more likely to engage in multimodal participation.

The theory of media multiplexity emphasizes the social context in which technology is embedded (Haythornthwaite, 2002). Individuals' prior experience with voluntary groups in both face-to-face and mediated forms affects how multimodal participation develops. Several aspects of prior experience have been examined in relation to voluntary associations: prior leadership, prior group experience, and active recruitment (see a review of predictors of voluntary participation in Smith, 1994). Applying the framework of media multiplexity, Hsieh (2012) posited that online networking skills (i.e. the ability to use technology for social interaction) may influence media multiplexity because such skills may motivate one to acquire different communication resources to maintain social relationships. In an interpersonal context, Ledbetter and Kuznekoff's (2012) study found that individual attitudes (whether one feels comfortable with self-disclosure online, whether one thinks online connections important) were key in shaping media multiplexity. Together, these results suggest the importance of considering relevant social and online experiences as the theory of media multiplexity is applied in different settings. It is reasonable to posit that if individuals had previous experience organizing a voluntary group, joining online groups, or were ever recruited online, they might have learned from these prior similar experiences. On the basis of this prediction, it is hypothesized that individuals with experience of group leadership, participation in online groups, and online recruitment are more likely to engage in multimodal group participation.

H2: Individuals with prior group leadership experience are more likely to engage in multimodal participation.

H3: Individuals with prior online group experience are more likely to engage in multimodal participation.

H4: Individuals with prior experience of online recruitment are more likely to engage in multimodal participation.

In addition to these experiences, the possession of digital skills may influence people's use of multiple technologies (Hsieh, 2012). It is likely that if individuals use the Internet or email regularly as part of their work or daily activity, they may easily carry the acquired skills into their participation in voluntary groups. In light of this, the next hypothesis is developed.

H5: Individuals with a higher level of routinized technology use are more likely to engage in multimodal participation.

Research thus far has attempted to identify various consequences of media multiplexity, such as relational closeness and development (Baym & Ledbetter, 2009; Caughlin & Sharabi, 2013), political engagement (Wei, 2012), and knowledge sharing in task-oriented groups (Yuan et al., 2010). People also construct a repertoire of websites to match their interests (Ferguson & Perse, 2000). Hence, it is possible that multimodal participation may predict increased involvement in voluntary associations, both in terms of the time and in the scope of group activities people choose to engage in.

A few studies have identified the positive relationship between multimodal participation and participatory outcomes. For example, Sessions' (2010) study found that attendance at face-to-face meetings not only increases members' involvement in the online community, but also reduces the likelihood of members ending their contributions to the community. Mesch and Talmud (2010) found that active participation in local community electronic forums, along with face-to-face communication with neighbors, was positively associated with local community involvement and participation. The final hypothesis explores the positive relationship between multimodal participation and individuals' engagement in voluntary groups.

H6: Individuals with a higher level of multimodal participation are more likely to (a) engage in a broader scope of voluntary group activities and (b) spend more time on voluntary group activities.

Moreover, it is proposed that multimodal participation may mediate the effects of different social and contextual factors on individuals' participation in voluntary associations. Multimodal participation can be seen as an opportunity for individuals to put their affiliation and online group experiences into action, which fosters ongoing participation in voluntary associations. There is a lack of prior theoretical support for these indirect relationships, so rather than a hypothesis, a research question is developed to address these mediating effects.

RQ1: Does multimodal participation mediate the effects of (a) group affiliations, (b) prior leadership experience, (c) prior online group experience, (d) prior online recruitment experience, and (e) routinized technology use on voluntary association participation?

Multimodal organizing and group impacts

The concept of multimodal participation at the individual level can be analogous to multimodal organizing at the group level. Under the multimodal view, media multiplexity signals a group's intention to maintain relationships with members, which may in turn influence how groups generate outcomes. Positive group outcomes can be linked to the notion of social capital at the collective level (Newton, 1997; Putnam, 2000; Stolle, 2000). Social capital refers to the features of social organizations (e.g. trust, norms, and networks) that can facilitate collective actions, which in turn improve the efficiency of the society (Putnam, 1993). In other words, groups may produce

outcomes of collective action that benefit not only group members but also people outside of the group (Samuelson, 1954).

Numerous studies have shown the usefulness of multimodal participation in fostering positive group outcomes. A common observation resulting from research on task-oriented groups is that groups can perform better if their computer-mediated communication is interspersed with face-to-face interaction, whether occasionally or regularly (Kennedy, Vozdolska, & McComb, 2010; Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002; Lin, 2007; Maznevski & Chudoba, 2000; Ocker, Fjermestad, Hiltz, & Johnson, 1998). Similar findings are also documented in another set of research that holds a broader definition of online communities, including political, task-oriented, and other more diverse groups. This body of work often concludes that face-to-face interaction helps to engage members in online group activities (Alon, Brunel, & Schnier Siegal, 2004; Koh, Kim, Butler, & Bock, 2007; Iriberri & Leroy, 2009; Rothaermel & Sugiyama, 2001).

Multiple modes of communication can be geared toward the different communication needs of members. In an online learning context, Haythornthwaite (2001) found that public means of communication such as webboard and Internet Relay Chat facilitate the feeling of belonging to the larger group, while private means of communication such as email allows for the development of closer friendships among certain members. Both public and private means of communication are critical to the sustainability of an online community (Haythornthwaite, 2001).

These research efforts have identified the benefits of communication multiplexity in various aspects of group coordination and group outcomes. Yet very little is known about how multiple modalities are arrayed in different aspects of group organizing or how groups capitalize on media multiplexity to organize group activities and achieve desired outcomes. Moreover, multimodal organizing and multimodal participation may have distinct contributions to the generation of group outcomes. It is expected that individuals who belong to a group which invests in multimodal organizing, and who engage in multimodal participation themselves, are likely to perceive that collective benefits are generated by the group. This direction has been hinted at in previous research, but has not yet been expanded further. For example, Kim, Kavanaugh, and Hult (2011) found that if a local group used multiple channels (such as listservs, discussion forums, and blogs) for organizing, then individual members were more likely to perceive the helpfulness of the Internet to connect with others in the community and become more involved in local issues. In light of this, the second research question is posed:

RQ2: How are the practices of multimodal participation and multimodal organizing related to the generation of group impacts?

Method

This paper's proposition of a multimodal view of voluntary associations was tested based on the analysis of a nationally representative telephone survey conducted by the Pew Research Center from 23 November to 21 December 2010, using a sample of 2303 adults (age 18 and older). Within this sample, 78.6% of participants were Internet users and around 79.6% of participants reported they were active in some type of voluntary group (for full descriptive statistics from the dataset, see the original report in Rainie, Purcell, & Smith, 2011). The average participant was 45.72 years old (SD = 17.73), female (51.6%), and White/Non-Hispanic (80.5%). Measurements of all of the 17 variables, including seven control variables, are detailed below and in Table 1.

Table 1. Zero correlations of study variables.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Diversity of VA	1																
2	Intensity of VA	.46***	1															
3	Group impacts	.43***	.36***	1														
4	Multimodal organizing	.31***	.32***	.42***	1													
5	Multimodal participation	.36***	.29***	.41***	.27***	1												
6	Degree of affiliations	.38***	.30***	.36***	.31***	.26***	1											
7	Prior leadership	.17***	.13***	.13***	.12***	.25***	.13***	1										
8	Prior online groups	.04*	.01***	.08***	.17***	.20***	.06***	.26***	1									
9	Online recruitment	.15***	.18***	.39***	.36***	.45***	.17***	.18***	.22***	1								
10	Routinized tech use	.11***	.01	.16***	.21***	.25***	.18***	.11***	.06***	.32***	1							
11	Sex	.03**	−.01	.08***	.02	.00	.01	.01	−.04***	−.06***	.07***	1						
12	Age	−.02	−.09***	−.08***	−.24***	−.05*	.07***	.01	−.11***	−.18***	−.25***	.06***	1					
13	Income	.20***	−.02	.12***	.11***	.03	.27***	.01	−.05***	.37***	.06***	−.08***	.03*	1				
14	Employment	.10***	−.05***	.02	.08***	.01	.06***	.01	−.06***	.38***	.05***	−.19***	−.22***	.30***	1			
15	Education	.15***	.08***	.15***	.19***	.19***	.28***	.10***	.02	.34***	.18***	.01	−.05***	.38***	.22***	1		
16	Parenthood status	.07***	.03*	.07***	.10***	.01	.07***	−.05***	−.07***	.06***	.03*	.09***	−.27***	.09***	.17***	.03**	1	
17	Geographic location	−.00	.04*	.06***	.13***	−.02	.05***	.05***	.06***	.15***	.16***	.01	−.09***	.07***	.07***	.14***	.00	1

*$p < .05$.
**$p < .01$.
***$p < .001$.

Measurements

Independent variables

The variable of the degree of affiliations was measured by classifying numbers into low affiliation and high affiliation. The former refers to those individuals belonging to two or fewer groups (48.6%) and the latter are those belonging to three or more groups (51.4%). Routinized technology use was measured by asking how often participants use the Internet or email from home and work (1 = never, 2 = less often, 3 = every few weeks, 4 = 1–2 days a week, 5 = 3–5 days a week, 6 = about once a day, 7 = several times a day). An index was created by averaging the values from these two items ($M = 4.78$, SD = 1.80). Prior leadership and prior online group experience were both measured by single items. The first element was found by the question asking whether participants have created a group of their own (0 = No, 91.5% and 1 = Yes, 8.5%) and the latter was found by asking whether participants have ever been part of a group that was created online but lasted less than 12 months (0 = No, 91.1% and 1 = Yes, 8.9%). Online recruitment was measured by asking whether participants have used the Internet or email to (1) invite someone or (2) be invited online or through email to join a social, civic, professional, religious, or spiritual group or not (0 = No, 1 = Yes). An index was created by aggregating these two items, with values ranging from 0 to 2 ($M = 1.01$, SD = .81).

Multimodal participation in voluntary associations was measured by asking whether members participate in their group through seven different mediated forms (0 = No, 1 = Yes) (sample questions: 'Do you contribute to an online discussion or message board for a group you are active in?'; 'Do you visit the website of a group you are active in?'). An index was created by summing the scores of seven items, with values ranging from 0 to 7 ($M = 4.38$, SD = 1.98, $\alpha = .73$). At the group level, the variable of multimodal organizing was measured by 10 items asking whether participants' groups engage in any type of technology-mediated activities (sample items: organize group activities or communication with members via text message; host online discussion groups or messages boards) (0 = No, 1 = Yes). An index was created by summing the scores of these 10 items, with values ranging from 0 to 10 ($M = 5.55$, SD = 2.49, $\alpha = .74$).

Dependent variables

One of the dependent variables (diversity of voluntary association participation) was measured by asking whether members have participated in their groups in the following four ways in the past 30 days (0 = No, 1 = Yes): taking a leadership role in a group they are active in; attending meetings or events for a group they are active in; contributing money to a group they are active in; and volunteering their time to a group they are active in. An index was created by summing the scores of these four items, with values ranging from 0 to 4 ($M = 2.18$, SD = 1.42, $\alpha = .73$). The other dependent variable (intensity of voluntary association participation) was measured by the question asking how many hours per week participants spend engaging in activities related to voluntary groups, whether in person, over the phone, or on the Internet ($M = 6.26$, SD = 7.47). Because of its non-normal distribution, a logarithmic transformation was applied to normalize this variable.

The variable of group impacts was measured by seven items asking if participants considered that the Internet had played a role in achieving seven outcomes, including: change in the local community; change in society at large; financial support to someone in need; emotional support to someone in need; fundraising for a specific cause; political campaigns for a candidate to be elected to a public office; and/or building awareness about an important social issue (1 = Yes, Internet played a major role, 2 = Yes, Internet played minor role, 3 = Yes, but Internet played no role at all, 4 = No, group did not achieve this). These items were then recoded using two

categories where 0 = no group impact (the original option of 4) and 1 = group impact (the original options of 1 to 3) for each item. An index was created by aggregating these seven items, with values ranging from 0 to 7 ($M = 2.85$, SD = 2.16, $\alpha = .78$).

Controls

Seven demographic variables were included in the model as controls, including age, gender, income, education, employments status, parenthood status, and geographic location of residency. These variables are generally perceived as the factors that may influence participation in voluntary associations, either because of the possession of resources conducive to group participation or because of the social roles (such as parenting) that motivate group participation (Almond & Verba, 1963; Mesch & Talmud, 2010; Putnam, 2000; Smith, 1994; Verba et al., 1995). The level of annual income was measured, where 1 = less than 10,000, 2 = 10,000 to under 20,000, 3 = 20,000 to under 30,000, 4 = 30,000 to under 40,000, 5 = 40,000 to under 50,000, 6 = 50,000 to under 75,000, 7 = 75,000 to under 100,000, and 8 = 100,000 to under 150,000, 9 = 150,000 or more ($M = 4.79$, SD = 2.43). The level of education was measured from 1 to 3, where 1 = under high school or high-school graduate (44%), 2 = post-high school or some college (27%), and 3 = college graduate or above (29%). Around 55% of participants were not employed full time; 45% were employed full time. Parenthood status was measured where 1 = not parent of children under 18 (71.2%) and 2 = parent of children under 18 (28.8%). The geographic locations of participants were distributed among a rural area (19.5%), a small city or town (35.2%), a suburb near a large city (23.7%), and a large city (21.6%). Age and age squared were both entered in the model to avoid the quadratic relationship with both diversity and intensity of voluntary participation.

Results

Hypothesis testing

An overview of the results of this study is presented in Figure 1. Hierarchical multiple regression models were used to test the hypotheses (H1–H6), and analyses of indirect effects were conducted to answer RQ1. All five independent variables, including the degree of affiliations ($\beta = .21$, $p < .001$), prior group leadership ($\beta = .12$, $p < .001$), experiences in online groups ($\beta = .14$, $p < .001$), experiences in online recruitment ($\beta = .35$, $p < .001$), and routinized technology use ($\beta = .16$, $p < .001$), proved to be significant predictors of multimodal participation (see Table 2). As such, the first hypotheses (H1–H5) were supported. In the model testing H6, the control variables were entered in the first block and multimodal participation was entered in the second block (see Table 3). The results showed that multimodal participation significantly predicted both diversity and intensity of voluntary participation. That is, a higher level of multimodal participation was positively related to different types of voluntary association involvement ($\beta = .37$, $p < .001$) as well as more time spent on voluntary association activities ($\beta = .30$, $p < .001$).

Additionally, gender, parenthood status, employment, education, income, and the geographical location of residence were significantly related to voluntary participation (see Table 3). In terms of diversity of voluntary association participation, women, people who were employed full time, who had a higher level income, and/or who lived away from big cities were more likely to engage in different types of voluntary association activities. On the other hand, men, people who had a lower level of income, who were parents with children under 18, and/or who lived away from big cities were more likely to spend more time on voluntary associations.

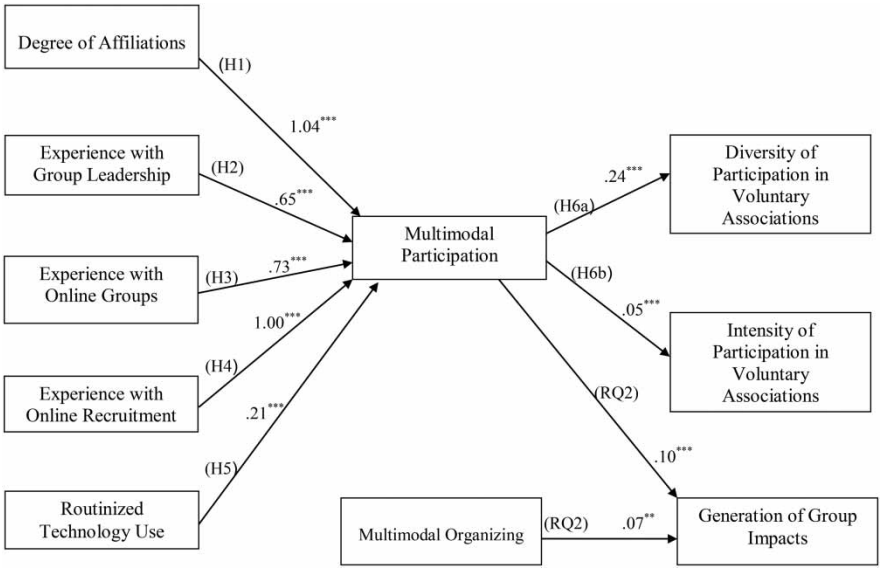

Figure 1. An overview of the resulting model. The coefficients displayed are in unstandardized form.

Table 2. Regression coefficients for multimodal participation.

Variables	Multimodal participation
Degree of affiliations	.21*** (1.04)
Prior group leadership	.12*** (.65)
Prior online group experience	.14*** (.73)
Online recruitment	.35*** (1.00)
Routinized technology use	.16*** (.21)
F-test	136.41***
Adjusted R^2	.30

Note: Coefficients in parentheses are unstandardized regression coefficients.
***$p < .001$.

To answer RQ1, indirect effects tests were conducted to explore whether multimodal participation mediates the effects of the five predictors on diversity and intensity of voluntary participation. Bootstrapping simple mediation was used with 5000 bootstrap resamples (Hayes, 2009; Preacher & Hayes, 2008). The significance of indirect effects is determined by examining bias-corrected and accelerated 95% confidence intervals (CIs) that include corrections for both median bias and skew (Efron & Tibshirani, 1993). The effect is considered significant if the intervals do not contain zero. The results showed that the indirect effects of all five predictors on diversity and intensity of voluntary participation through multimodal participation were significant because zero was not contained in the intervals (see Table 4).

To answer RQ2, Poisson regression modeling was used because the dependent variable (group impacts) was a count variable (0–7) and zeros accounted for 4.2% of the data.[1] The goodness-of-fit chi-squared test was not statistically significant (deviance = 1024.31, df = 1055, $p > .05$). This indicates that the Poisson model form fit the observed data. The results showed that – after controlling for age, income, geographic location of residence, and education – multimodal organizing (Wald chi-square = 40.40, df = 1, $p < .001$) and multimodal participation (Wald

Table 3. Results of regression analyses.

	Model 1: Diversity of VA participation		Model 2: Intensity of VA participation	
	Block 1: Demographic factors	Block 2: Predictor	Block 1: Demographic factors	Block 2: Predictor
Sex (women)	.09** (.23)	.08** (.21)	−.10*** (−.07)	−.10*** (−.07)
Age	−.22 (−.02)	−.26 (−.03)	.05 (.00)	.00 (.00)
AgeSquared	.24 (.00)	.32 (.00)	.01 (.00)	.07 (.00)
Income	.13*** (.07)	.14*** (.07)	−.10** (−.02)	−.10** (−.01)
Employment (full-time employed)	.17*** (.44)	.18*** (.48)	−.04 (−.03)	−.02 (−.02)
Education (college degree)	.07* (.12)	−.03 (−.04)	.06* (.03)	−.02 (−.01)
Parenthood status (with children under 18)	.02 (.06)	.02 (.05)	.09** (.07)	.09** (.06)
Geographic location (large city)	−.10** (−.12)	−.08** (−.10)	−.12*** (−.04)	−.11*** (−.04)
Multimodal participation		.37*** (.24)		.30*** (.05)
Constant	−***	−***	−***	−***
F-test	14.92***	41.40***	7.16***	21.81***
Adjusted R^2	.07	.20	.03	.12

Note: Coefficients in parentheses are unstandardized regression coefficients. VA = voluntary association.
*$p < .05$.
**$p < .01$.
***$p < .001$.

Table 4. Bootstrapping simple mediation effects of multimodal participation on diversity and intensity of voluntary association participation.

	DV: Diversity of VA participation			DV: Intensity of VA participation		
		95% CI			95% CI	
Variables	Point estimate	Lower	Upper	Point estimate	Lower	Upper
Degree of affiliations	.1710	.0820	.3126	.0516	.0243	.0931
Prior leadership	.0891	.0234	.1927	.0275	.0075	.0572
Prior online group experience	.1231	.0515	.2334	.0345	.0133	.0658
Online recruitment	.1761	.0971	.2788	.0510	.0293	.0786
Routinized tech use	.0361	.0165	.0702	.0103	.0045	.0189

Note: VA = voluntary association. Bias corrected and accelerated CIs; 5000 bootstrap resamples.

chi-square = 107.98, df = 1, $p < .001$) were significantly related to group impacts (see Table 5). People who engage in multimodal participation and whose groups use multimodal organizing were likely to report their groups have produced more impacts.

Geographic location of residence (Wald chi-square = 26.77, df = 3, $p < .001$) and income (Wald chi-square = 5.25, df = 1, $p < .05$) also predicted the perceived group impacts. In other words, people with a higher level of income and those living in bigger cities were likely to report more impacts generated by the groups in which they participate. Note that in Table 5, the exponentiated coefficients represent the ratio of the incidence rate at each category of the factor to the incidence rate at the reference category (Location = 4 and Education = 3).

Table 5. Results of Poisson regression of group impacts.

	B	SE	Exp(B)	Wald chi-square	df	Sig.
(intercept)	.37***	.11	1.45	11.57	1	.001
Age	.00	.00	1	.01	1	.928
Income	.02*	.01	1.02	5.25	1	.022
Location = 1[a]	−.17**	.05	.85	10.70	1	.001
Location = 2	−.17***	.04	.84	15.88	1	.000
Location = 3	−.19***	.04	.82	21.95	1	.000
Location = 4	0	–	1	–	–	–
Education = 1[b]	−.02	.02	.98	.23	1	.632
Education = 2	−.02	.04	.98	.23	1	.634
Education = 3	0	–	1	–	–	–
Multimodal participation	.10***	.01	1.11	107.98	1	.000
Multimodal organizing	.07***	.01	1.07	40.40	1	.000

[a]Location = 1, living in a rural area, Location = 2, living in a small city or town, Location = 3, living in a suburb near a large city, Location = 4, living in a large city.
[b]Education = 1, under high school or high-school graduate, Education 2 = post-high school or some college, Education = 3, college graduate or above.
*$p < .05$.
**$p < .01$.
***$p < .001$.

For example, the incidence rate for people living in a suburb near a large city (Location = 3) is 0.82 times the incidence rate for people living in a large city (the reference group Location = 4) ($p < .001$).

Discussion

In discussing the predominant Internet and CMC research, Parks (2009) suggested that instead of simply focusing on the surface feature of the Internet or the dramatic mode switch from offline to online engagement, more attention should be directed toward situating the phenomena within the broader context of communication theory. Multimodalities have gradually become the norm, shaping the way individuals and groups interact with one another (Baym, 2009). In the meantime, researchers in the CMC area have expressed concern about the lack of analytical frameworks and empirical studies designed to understand increasingly multimodal interactions at individual, group, and community levels (Baym, 2009; Parks, 2009; Walther, 2010; Walther & Parks, 2002). To address these concerns, this study presents an empirical solution and proposes a multimodal view to understand how people participate in and organize associational activities across different media modalities.

Theoretically, this study makes three contributions. First, it extends and enriches the framework of media multiplexity. Second, it incorporates a multimodal view in the conception of social capital theory. Third, it addresses the inadequacy of the ecology model of voluntary associations by examining individual participation through multiple technology use.

Media multiplexity and social contexts

This study extends the framework of media multiplexity to the voluntary association context. In particular, it identifies different social and contextual factors that shape multimodal participation. Individuals' experiences with different group affiliations (H1), leading voluntary groups (H2), online groups and recruitment (H3 and H4), and regular technology use (H5) all significantly

influence their multimodal participation, which in turn fosters a greater level of involvement in voluntary associations (H6a and H6b). Together, these findings substantiate the social context in which multimodal participation occurs. That is, multimodal participation is practiced in response to the way that people have learned and obtained associational experiences and acquired digital skills. As previous research shows, belonging to multiple affiliations and shouldering group leadership both motivate individuals to seek technological resources for social activities (Kavanaugh et al., 2005). Moreover, the positive relationships between multimodal participation and various online experiences indicate that digital skills learned from general use (or prior use) of technology can be seen as a competency that helps individuals to be familiar with using such technology to engage in other social activities (Gibbs, Ellison, & Lai, 2011; Hargittai, 2005; Livingstone, 2008).

Together, individuals who belong to more groups and possess leadership and online experiences are likely to spend more time and invest in different types of activities in voluntary associations, if they participate in groups through multimodal ways (RQ1). However, beyond the scope of this study, it is anticipated that as people's engagement with voluntary associations changes as a result of multimodal participation, their social practices will change as well, in turn shaping further multimodal participation. These practices may well be reciprocal and ongoing. A longitudinal study will help identify such interactions between technology use and enacted and reenacted social practices (Orlikowski, 2000).

A multimodal view and cross-level social capital

Findings of this study extend social capital theory by considering media multiplexity in generating social capital at multiple levels. At the individual level, the results of this study showed that people who belong to multiple groups and who had experience leading a group tend to engage in multimodal participation, which in turn helps overall engagement in voluntary associations. In other words, people who are potential bridges between multiple groups are likely to tap into technological opportunities to acquire social and networking benefits at the individual level. At the group level, findings of this study provided empirical evidence explaining the usefulness of multimodal organizing in generating social capital in the form of accomplishments of group, community, and society (RQ2).

By examining individual and collective social capital in one study, this research demonstrates the appropriateness of incorporating a multimodal view to conceptualize social capital across levels. In collective action research, an enduring tension exists between collective interests and individual benefits (Marwell & Oliver, 1993). Further research can thus investigate the network roles of individuals in multimodal participation and multimodal organizing. It is possible that people who belong to multiple groups or occupy leadership positions are also more likely to lead the group through multimodal organizing and help the generation of group impacts. Accordingly, those may be the same people who can acquire individual social capital and also help produce collective social capital, if they are willing to do so. More research can illuminate the degree to which a voluntary association's positive impacts spill over to the individuals involved, and vice versa.

Member participation and group organizing

Building on the assumption of the ecology model of voluntary associations concerning individuals' constraints in voluntary participation (McPherson, 1983), this study proposes the multimodal perspective to investigate the phenomenon of voluntary associations at both individual and group levels. In particular, the findings of this study revealed that participation through diverse mediated forms – such as posting news about the group on a social networking website or visiting

the group's website – increases one's overall engagement with voluntary associations. Groups' use of multiple modes of communication to organize group activity and reach out to members also facilitates the generation of group impacts.

The topic of technology use in voluntary associations is not new, but relatively little research has examined how individuals and groups incorporate technology use as a way to overcome individual and group constraints. That is, individuals have limited time to allocate to different social activities, which renders it necessary for voluntary and work groups to compete with each other in order to attract members' time and engagement (McPherson, 2004). Findings of this study provide empirical evidence demonstrating how individuals and groups incorporate multiple technology use as a potential way to address such constraints in sustaining voluntary associations.

Due to the limitations of secondary data, no variables other than multimodal organizing and group impacts were available. Scholarly understanding is limited regarding the process of how groups engage in multimodal organizing, and how that leads to the generation of group impacts. It is anticipated that other group variables as posited in the ecology model – such as group size, group composition, content of group communication, and network structure – are critical in facilitating group impacts. Further research will focus on identifying other group variables, which can help illuminate the relationships between groups as a result of multimodal organizing.

Conclusion

Proposing a multimodal view of voluntary associations, this study investigates the factors that facilitate multimodal participation and multimodal organizing, and how these in turn affect the involvement in voluntary associations and the generation of group outcomes. One of the limitations of this study is its reliance on secondary data to explain and test the theoretical framework. As a result, the measurements of the variables were limited by those present in the original data. For example, experience with online groups was measured by a single item, focusing on a participant's prior experience participating in groups that did not last long. A cross-sectional survey does not allow for causality claims. It is possible that participants with more intense involvement in their voluntary associations are more motivated to engage in multimodal participation. Similarly, groups may achieve an outcome (e.g. raising money for a specific cause), which in turn motivates them to use multiple modes of communication to organize more group activities. Needless to say, a longitudinal design and another phase of confirmatory study would be required to address and clarify these concerns.

Despite these limitations, this research presents a multimodal view of voluntary associations. Unlike the existing models of voluntary associations, which emphasize the structural constraints on individual participation and group sustainability, this study suggests that using a multimodal view may change the way voluntary associations have long been conceptualized as having a lack of resources and member involvement. It is true that other factors, such as individuals' motivations, may decide voluntary participation. Yet in the current convergent media environment, human behaviors are both directly and indirectly influenced by technology use (Bimber, Flanagin, & Stohl, 2012). Multimodal participation and multimodal organizing could be seen not only as an opportunity but also a context itself in which human behaviors are embedded and enacted.

Note

1. The question asking about groups' multimodal organizing did not provide the information about how each of the participant's groups uses multiple technologies for organizing. Hence, multimodal organizing was not treated as a second-level data. Multilevel modeling was not used.

Notes on contributor

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