Adaptation of Collective Action in a Web of Mixed-Mode and Networked Environment

Meetup Groups as an Example of an Ecological Response

James E. Katz (Boston University)
Chih-Hui Lai (University of Akron)

Abstract

With the growth of communication technologies in society, collective action has taken new forms that may not be well conceptualized by existing theories. Hence two meaningful theoretical and practical questions are: how is collective action performed by these new forms of human associations and with what effects? To address these questions, this study compared and drew on theories of collective action and organizational ecology to investigate a particular type of voluntary associations, *mixed-mode groups*. Mixed-mode groups are created and organized online to meet physically in geographically defined ways. An online survey was conducted with 171 randomly sampled groups on Meetup.com. Meetup.com is a website that facilitates the creation and coordination of mixed-mode groups. An analysis of the survey data showed that using internal and external strategies helped groups generate positive group impacts: internal strategies had direct effects on group impacts while external strategies had more circuitous and additive effects on group impacts through network resources. Accordingly, mixed-mode groups navigated across boundaries, became embedded in the networked environment, and generated group impacts. These findings show that, unlike the expectations of collective action theories, ecological theory can be robustly extended to address the mechanisms underlying collective action of contemporary voluntary groups.

Keywords: collective action, boundary spanning, the Internet, voluntary associations, ecology

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The expanding use of personal and digital communication technology is affecting all domains of human activity, including voluntary associations. Questions about how these technologies are used by voluntary associations and what their effects are on such organizations are critical because in contemporary societies voluntary associations are vital not only to attaining social ends but in many cases giving structure and meaning to people's lives. By engaging in collective action, voluntary associations not only provide benefits to their members but also generate impacts to the wider public (Babchuk & Edwards, 1965; Hooghe, 2003; Putnam, 1995, 2000; Stolle, 2000; Tocqueville, 1968; Wollebæk & Selle, 2002). Examples of traditional voluntary associations range from informal neighborhood associations, leisure groups, and hobby clubs to large sports leagues, religious congregations, activist political groups, and professional and alumni associations. As the digital era dawned, many analysts and scholars initially anticipated that new developments in communication, most particularly the Internet, would destroy or severely erode traditional forms of voluntary associations (Turkle, 1996). What was underestimated was the possibility of the Internet actually extending the reach of voluntary associations and creating many opportunities for new ones to come into being (Katz & Rice, 2002; Wellman et al., 2001). Yet what is in little doubt is that new communication technologies alter the operations of voluntary associations as well as affect their internal communication patterns and their ability to connect with current and potential new members.

Certainly, the public's view is that voluntary associations are significant factors in both the public sphere and in their own lives. A 2011 Pew Internet and American Life Project report underscores the Internet's contribution to contemporary voluntary groups on different levels.

The report shows that 59% of respondents think the Internet has played a role in their groups' ability to impact society at large, and 49% believe that their groups can influence local communities because of the Internet (Rainie, Purcell, & Smith, 2011). Voluntary associations have the potential to generate outcomes that affect the group, the community, and the society, and new communication and information technologies (ICTs) would seem to play an important role in the process. There are issues concerning the way in which communication technology affects and are used by members of voluntary associations and that raise the questions about the role and sustainability of voluntary associations. This is a critical question in light of their role not only in delivering services or at the level of individual fulfillment. Their significance extends even to the level of the sustainability of democracy (Lipset, Trow, & Coleman, 1956). Hence understanding how communication technology affects the processes of voluntary associations in terms of their recruitment of new members, their operations, and their impacts becomes an intellectually and substantively worthwhile area of inquiry.

It is also a worthwhile area of inquiry of the intersection of communication and organization theorizing. Analytically, theories of collective action appear to be a natural choice to understand the interplay between technology use and organizational behaviors. Unlike theorists asserting the importance of face-to-face engagement in collective action (Putnam, 2000), earlier views contend that people are more empowered to participate in online collective action because of the features of relative anonymous interaction and fluid membership (Lea & Spears, 1991; Postmes, & Brunsting, 2002). The outcomes of such collective activities made possible online usually take the form of communal (information sharing) and connective (direct connections) public goods (Fulk et al., 1996).

More recently, researchers have proposed that, instead of holding an either-or (online/offline) lens, we should be concerned with how technology becomes a context for varying forms of collective action (Bimber, Flanagin, & Stohl, 2012; Flanagin, Stohl, & Bimber, 2006). Although these new conceptualizations provide a broader lens for looking at fluid forms of contemporary collective action, they also give rise to the question of where the "collective" lies, that is, who are involved and affected by the outcomes of collective activity. Given the widespread importance of voluntary associations in society, this is arguably a critical theoretical void that needs to be addressed. Ecology theories, on the other hand, characterized by multilevel analysis of the interaction of collective behaviors and environmental influences (Aldrich, 1999; Monge, Heise, & Margolin, 2008), can provide insights into the adaptive process of individuals and the collective and the resulting effect of such adaptive efforts. They can thus be extended to analyze processes and outcomes of voluntary associations in a more meaningful way.

To address these pragmatic and theoretical questions, this article first reviews the relevant literature, then presents empirical evidence that sheds light on the above questions and finally draws conclusions from the inquiry. More specifically, this study used a new form of voluntary associations, *mixed-mode groups*, to investigate empirically practical and theoretical concerns about contemporary collective action. Simply defined, mixed-mode groups are an emerging type of voluntary associations that are created and organized online to interact physically in geographically defined ways (Author, in press).

Theories of Collective Action and Ecological Approaches

General theories of collective action seek to explain the motivation of groups to cooperate and to perform collective action (Olson 1965). In essence, collective action is driven by mutual interests and benefits from coordination action (Marwell & Oliver, 1993) and can be

seen as a communicative process "insofar as it entails efforts by people to cross boundaries by expressing or acting on an individual (i.e., private) interest in a way that is observable to others (i.e., public)" (Flanagin et al., 2006, p. 32). In particular, public goods theory is concerned with the explanation of collective human action to create public goods. Public goods are the outcomes of collective actions taken by two or more people that benefit the general public, some of whom do not contribute to the creation of the public good (Samuelson, 1954). Public goods are non-rival, meaning that one's use of the public good does not reduce the amount that others can use. Public goods can be tangible (e.g., parks) and intangible (e.g., electronic databases).

Research on collective action generally falls into two categories: generative mechanisms of collective action (mobilization) and the adoption of innovations (Monge & Contractor, 2003). The former is centered on the individual and network mechanisms conducive to collective action and the creation of the public good. For example, with individuals and organizations embedded in dense and central networks, public goods are likely to be produced (Laumann, Knoke, & Kim, 1985; Monge et al., 1998; Wasko, Teigland, & Faraj, 2009). The latter is concerned with the individual variables predicting the adoption and use of innovations within an organizing context. For example, individuals are influenced by their perceptions of gains in deciding their contributions to the information commons such as intranets (Fulk et al., 2004; Wasko& Faraj, 2005); they are also influenced by others in terms of adopting a new communication system in organizations (Rice et al., 1990; Yuan et al., 2005). A widely known extension of the public goods theory to technological contexts is Fulk et al. (1996) conception of connective and communal goods. Connective goods refer to the functionality of communication and information systems (e.g., intranets and online discussion boards) that allow direct connections

between members within the collective whereas communal goods are the collective information stored and shared among members.

Mixed-Mode Groups

Mixed-mode groups are contemporary and technology-mediated forms of voluntary associations, but with relatively low thresholds for initiating and participating in associational activities and the flexibility of organizing and interacting in a multimodal way (Bimber et al., 2012). As such, they fulfill ongoing pluralistic needs and interests in human society. Examples of websites that enable mixed-mode groups include Facebook, Craigslist, Meeetup.com, and Twitter. The concept of mixed-mode groups has its conceptual roots in the notion of mixed-mode relationships, which refers to the switching of interpersonal interactions and relationships from online modes to offline modes (Walther & Parks, 2002). A group created and organized through Meetup.com that engages in hiking activities in the San Francisco area is an example.

Following these theories of collective action and public goods, collective action of mixed-mode groups is exhibited through shared information and connections built online (Fulk et al., 1996) as well as through social interactions taking place during face-to-face group meetings (Putnam, 2000). Hence, outcomes of this collective action create the public good of a relatively open online space made available to any current and potential members for operation and organizing of the group. What is less known is that outcomes also take the form of impure public goods as the facilitation of personal relationships and shared collaboration is made available only to members who attend the face-to-face meetings. Impure public goods, or called club goods, are similar to public goods because the consumption of club goods is nonrival to the extent that all participating members can have access to the benefits; but unlike public goods, club goods have the characteristic of exclusion based on active membership (Sandler &

Tschirhart, 1980). For example, the activities that a sports team engages in are only available to the attending members; however, within the team, each member is offered equal enjoyment.

Two conceptual challenges stem from this application. First, depending on the space where mixed-mode groups' collective action takes place, the collective goods may take either public or impure public forms. Hence current theorizing about online connective and communal public goods (Fulk et al., 1996) and club goods (Sandler & Tschirhart, 1980) appear inadequate or ambivalent in seeking to comprehensively account for the collective action of mixed-mode groups. Second, extant theories and research of collective action are heavily reliant on the production of public goods, which leaves the issues of how the public goods facilitate group outcomes relatively unexplored (Monge et al., 1998). For instance, as part of in-person meetings, mixed-mode groups may visit local restaurants, which helps keep the business open or even helps community overall. It is possible that the public goods of those groups may not only help mixed-mode groups achieve member satisfaction but also spill over to the geographic community. To address these challenges, we argue that ecological theories may serve as a more useful framework for understanding contemporary forms of collective action.

Ecological Approaches and Collective Action

In the organizational context, the ecological perspectives focus on the relationships between organizations and environments and examine the process of how communities and the populations of organizations that constitute them struggle to acquire resources in order to survive, by means of interacting with other members as well as with their environments (Campbell, 1965; Hannan & Freeman, 1977; McPherson, 1983). Central to the survival of organizations are the seemingly mutually exclusive mechanisms: strategic choice and environmental forces. Simply defined, voluntarism (choice) and determinism are the two categories that describe the

preponderance of the organization and the environment in deciding organization decision making, change, and adaptation (Hannan & Freeman, 1977). A broadly accepted view is that these two categories should be seen as interacting with each other, which in turn results in organizational behaviors (Baum & Shipilov, 2006).

The advantage of the ecological perspectives lies in their ability to explain phenomena using the same theoretical process at different levels (Monge et al., 2008). In contrast with the research of collective action and public goods that treats organizations as relatively closed systems, ecological theories see individuals and organizations subject to influences from the environment (McPherson, 1983). In the collective action realm, ecological theories can thus be used to understand how individuals within organizations as well as organizations adapt themselves by coping with internal and external dynamics in order to accomplish collective action. These adaptations can take the form of strategic actions such as involving external social actors to secure necessary resources for group operation and task completion (Ancona, 1990; Ancona & Caldwell, 1988, 1992). Moreover, examining outcomes of voluntary associations reflects the ecological notion of *co-evolution*, which concerns the interactions between the organization and its environment, and the subsequent consequences of these interactions for the environment (Baum & Singh, 1994). Instead of isolating online or offline environments, an ecological view can provide a systematic analysis of how mixed-mode groups incorporate both environments in producing outcomes of collective action, and how these interactions with the environments in turn influence the groups well as the environments.

Because of the lack of existing research linking strategic action and environmental influences in the context of technology-enabled collective action, a general research question is posed. This research question focuses on strategies that mixed-mode groups use to engage in

collective action, with particular attention on groups' interactions with the environment in organizing. These interactions are hypothesized to influence outcomes both within and outside the group (see Figure 1).

> RQ: How do mixed-mode groups engage in collective action by incorporating online and offline environments into organizing and generating group impacts?

Methods

The data were collected from Meetup.com, a website designed to facilitate the creation of online groups based on shared interests and physical locations and to coordinate offline group meetings. In other words, it forms and organizes mixed-mode groups. A stratified random sampling strategy was used to generate 2,000 Meetup groups. Online survey respondents were recruited from this sample. Considering the importance of age in group survival, as observed in a previous analysis by the author (in press),[1] the entire population of Meetup groups (mainly in North America) was sorted into three subpopulations based on age (less than one year, between one and two years, and more than two years). The 2,000 groups were then randomly pulled from these subpopulations in proportion to the age distribution: 48.4% (968 groups) aged less than one year, 24.73% (495 groups) aged between one and two years, and 26.87% (537 groups) aged more than two years.[2] In situations where the same organizers managed multiple groups, only one group was randomly selected for invitation. Moreover, some groups listed in the sampling frame disbanded by the time the invitation was extended. Consequently, 1,237 of the 2,000 sampled groups were considered as valid subjects for invitation.

Those 1,237 selected organizers were asked individually through the contact function on Meetup.com to participate in the online survey, and 171 responded (response rate = 13.82%).[3] Although this response rate was disappointing, it was not uncommon to experience comparable low rates in online surveys (Dillman, 2000). Data collection lasted approximately two months,

from December 4, 2010 to February 1, 2011. The age distribution of the participating groups was slightly different from the Meetup population. The groups aged less than one year were 29.76% of the sample (under-represented), those aged between one and two years were 30.36% of the sample, and those over two years were 39.88% of the sample (over-represented). Moreover, among the 171 groups, about one-third (31.8%, n = 54) of the groups experienced a leadership change as the originator of the group yielded the running of the group to someone else.

Instruments and Measures

To answer the research question, this study evaluates different sets of variables, including group strategies, group impacts, network embeddedness, and resource acquisition (see Figure 1). Because of the study' exploratory nature, these variables were largely informed by previously conducted interviews with Meetup group organizers (Author, in press). Despite lacking well-established validity, this procedure revealed strategies and impacts that were relevant and feasible for the Meetup groups in the study. The survey was pilot tested with five Meetup organizers to validate original scales and clarify question wording.

Types and Scope of Strategies Used

To examine the patterns of internal and external activities that a group engages in, we used the scope of strategies. The scope of strategies was examined through two categories: internal and external strategies. Each respondent was asked to indicate whether and how often they used a given strategy to run the group, using a 5-point scale (1 = *never*, 2 = *once*, 3 = *a few times*, 4 = *many times*, and 5 = *regularly*). Internal strategies were measured using ten items and external strategies using eight items, according to the examples provided by the organizers during the previously conducted interviews. These ten types of internal strategies included: group policy, requirement of member dues, member involvement, diversity of activities, creation

of subgroups, private events, focused topics, use of technology for communication, diversity of locations, and regular events. Eight types of external strategies included: copy other Meetup groups, copy other non-Meetup groups, cross-post events by other Meetup groups, cross-post events by other non-Meetup groups, joint events with other Meetup groups, joint events with other non-Meetup groups, activity as part of local events, and interaction with local venues. Each of the 18 items was further dichotomized into "0," where the given strategy is never used, and "1," where the strategy is used at least once. Index values ranged from 0 to 10 for internal strategies and from 0 to 8 for external strategies. Two separate indexes were then created by aggregating the values of the ten items for internal strategies (M = 5.967, SD = 1.986) and eight items for external strategies (M = 3.831, SD = 2.365).

Network Embeddedness

Directionality was considered when measuring a group's embeddedness with its network contacts through communication. To measure incoming flow of networking, respondents were asked to indicate how often other Meetup groups and other non-Meetup groups or organizations have contacted them over the course of their groups' development, using a 6-point scale (1 = *never*, 2 = *once or twice a year*, 3 = *once or twice a month*, 4 = *once or twice a week*, 5 = *several times a week*, 6 = *nearly every day*). Another set of items examined a group's outgoing networking with five different contacts, including other Meetup groups, local venues to hold group events, other organizations, personal contacts, and members of other Meetup groups. These items were also assessed on a 6-point scale with response options ranging from 1 = *never* to 6 = *nearly every day*. The aggregated latent variable of network embeddedness (α = .806, M = 1.907, SD = 0.653) consisted of these six items that measured the frequency of a group's overall communication with its network contacts.[4]

Resource Acquisition

Inspired by boundary-spanning literature that examines a network's internal density, external range, and impacts on group performance (e.g., Reagans Zuckerman, & McEvily, 2004), resource acquisition was investigated in two dimensions: density and diversity of resources received. Respondents were asked to indicate how often they had received help of any sort for running the group from six types of network contacts using a 6-point scale (1 = *never*, 2 = *once or twice a year*, 3 = *once or twice a month*, 4 = *once or twice a week*, 5 = *several times a week*, 6 = *nearly every day*). The aggregated latent variable of density of resources received (α = .796, *M* = 1.722, *SD* = 0.624) consisted of six items that measured the frequency of a group's receipt of resources from its network contacts.[5] Each of the six items was further dichotomized into "0," where the given contact was never sought after for support, and "1," where the contact provided support at least once. The index of diversity of resource received was then created by aggregating the values of the six items and the index value ranges from 0 to 6 (*M* = 2.919, *SD* = 1.857). To avoid the potential problem of multicollinearity, a two-stage approach was performed to create a second-order construct called *resource acquisition* (Agarwal & Karahanna, 2000; Chin & Gopal, 1995; Osei-Bryson, Dong, & Ngwenyama, 2008). The latent variable scores of density and diversity of resources received were initially estimated, and these scores were then entered as indicators for the second-order construct of resource acquisition (*M* = 2.021, *SD* =.899). Resource acquisition was the variable used in the assessment of the complete model.

Group Impacts

Informed by Meetup organizers' responses during the previously conducted interviews (Author, in press), a group's impact was measured using six items that assessed aspects of interpersonal relationships, community development, and local interaction. These dimensions

coincided with the internal and external impacts of voluntary associations as suggested by Smith (2000). Six items were assessed on a 5-point scale, with response options ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Some examples of the possible responses include "my group has contributed to building and/or maintaining relationships among members" and "my group has maintained local area interest in the group topic" ($\alpha = .874$, $M = 4.132$, $SD = 0.756$).

Control Variables

Three additional variables were included as controls: *group age*, *group size,* and *meeting frequency*. It has been argued that a voluntary association's impacts are usually observable after one or two years of its establishment (Smith, 2000). In the boundary-spanning literature, temporal development is suggested to relate to boundary-spanning activity, which in turn affects group outcomes (e.g., Sawyer, Guinan, & Cooprider, 2010). Therefore, group age was included in the model. It makes sense that group size and frequency of face-to-face interaction are also key factors to generate impacts of voluntary associations: a group with enough members who frequently show up for activities would be likely to see significant impacts (Smith, 1999). Respondents were asked to provide their groups' month and year of establishment on Meetup.com. Based on this information, the group ages for all 171 groups were calculated to the cutoff date of February 1, 2011. Group size was based on the respondents' self-reported numbers of members at the time of the survey. Respondents were also asked to identify how often (number of times) their groups met in the last month to assess a group's meeting frequency.

Analysis Procedures

Given the exploratory nature of this study, partial least squares (PLS) path modeling was used (see reviews of PLS modeling by Henseler, Ringle, & Sinkovics, 2009 and Sosik, Kahai, & Piovoso, 2009). Data were analyzed using Smart PLS (Ringle, Wende, & Will, 2005), an easy-

to-use PLS path modeling software (Temme, Kreis, & Hildebrandt, 2010). According to Chin (1998), PLS models can be evaluated using a two-step process: (1) the assessment of the outer/measurement model (i.e., reliability and validity of reflective constructs) and (2) the assessment of the inner/structural model (i.e., variance explanation of dependent variables, effect sizes, and significance of the path coefficients). In the following section, the measurement model is assessed using these criteria, after which the results of assessing the structural model and the significant paths are reported.

Results

A measurement model is typically assessed based on its reliability and validity (Henseler et al., 2009). Except for network embeddedness and group impacts, the other six variables were measured with a single indicator or an aggregated index and thus were not included in this part of the assessment. For the assessment of reliability, outer loadings of all indicators for network embeddedness and group impacts were greater than .60, and the composite reliability and Cronbach's alpha for these two latent variables were well above .70, indicating the measurements were reliable (Bagozzi & Youjae, 1988; Fornell & Larcker, 1981; Gotz, Liehr-Gobbers, & Krafft, 2009; Sosik et al., 2009) (see Table 2). There was also evidence of sufficient convergent and discriminant validity.

First, the average variance extracted (AVE) for network embeddedness and group impacts exceeded the recommended criterion of .50, suggesting sufficient convergent validity because these two latent constructs can explain at least 50% of their indicators' variances on average (Chin, 1998; Fornell & Larcker, 1981; Gotz et al., 2009). Second, the AVE of network embeddedness and group impacts were greater than their squared correlations with any other constructs, meaning each latent variable shared more variance with its own assigned indicators

than with another latent variable representing a different block of indicators (Chin, 1998; Fornell & Larcker, 1981; Gefen, Straub, & Boudreau, 2000; Gotz et al., 2009) (see Tables 1 & 2). Another criterion of discriminant validity is to check whether the loading of each indicator is greater than all of its cross-loadings (Chin, 1998; Gefen et al., 2000). A cross-loadings table (see Table 3) revealed that each item loading was higher on its assigned construct than on the other constructs, supporting adequate discriminant validity. All of the t-values of outer loadings were greater than 2.58 ($p < .01$).

In terms of the overall model fit of the structural component, three criteria were used (Chin, 1998; Henseler et al., 2009). First, Smart PLS generated the results of the R-square for the three endogenous variables: group impacts ($R^2 = .234$), resource acquisition ($R^2 = .470$), and network embeddedness ($R^2 = .428$). In other words, 23% of the variance of group impacts, 47% of the variance of resource acquisition, and 43% of the variance of network embeddedness, respectively, were explained by the model. These values approximate or exceed the criterion of $R^2 = .26$ (Cohen, 1988) for large effect sizes, which supports the argument that the conceptual model offers an adequate explanation of the analytical results.

Second, an F-test was conducted to assess whether the model is a significant overall fit to the data. The results showed that the four predictors together (internal strategies, external strategies, network embeddedness, and resource acquisition) had a substantive effect on the endogenous variable group impacts ($F[4,163] = 6.756$, $p < .001$). Last, a global criterion of goodness-of-fit for PLS path modeling, the GoF index, was used. The GoF index is the geometric mean of the average communality index (outer measurement model) and the average R^2 value of the endogenous latent variables (Tenenhaus et al., 2005). It ranges from 0 to 1, where higher values represent better path-model estimations (Henseler et al., 2009). The GoF

value of the model was 0.614, which exceeds the cut-off value of 0.36 for large effect sizes of R^2 (Wetzels, Odekerken-Schröder, & van Oppen, 2009).[6] In sum, the results indicate a good prediction performance of the model overall.[7]

The significance of the path coefficients was assessed through asymptotic t-statistics, which were obtained by bootstrap resampling (500 samples) (Chin, 1998). Figure 1 presents the estimates obtained from the PLS analysis. Results showed that the paths from the two control variables (group age and meeting frequency) significantly predicted group impacts. Both internal and external strategies significantly predicted network embeddedness, which in turn affected resource acquisition. In other words, network embeddedness was useful for groups to acquire resources when implementing either internal or external strategies. The external and internal strategies differed, as the former had both significant direct and total effects on resource acquisition, while the latter only had significant effects on resource acquisition after including network embeddedness ($\beta = .156$, $t = 2.257$, $p < .05$). Additionally, both internal and external strategies had significant total effects on group impacts, but only internal strategies had direct effects on group impacts. External strategies, on the other hand, had effects on group impacts after including network embeddedness and resource acquisition ($\beta = .173$, $t = 2.292$, $p < .05$).[8]

Discussion

In terms of accounting for multimodal collective goods and inevitable group interactions with multimodal environments, existing theories of collective action and public goods have limited applicability when it comes to mixed-mode groups. To address this limitation, this study employed ecological theories to investigate the process and outcomes of contemporary collective action. Groups from the website Meetup.com were studied as an example of mixed-mode groups. While being embedded in the environment consisting of individuals and groups within and

outside Meetup.com, online and offline, these Meetup groups enacted strategies coping with internal and external dynamics. Specially, by interacting with the environment in the form of external networking helped these groups acquire resources necessary for group operation, and generate impacts that influenced members and the local community.

Applying the ecological perspectives helps provide theoretical reasons to explain the importance and usefulness of Internet use in facilitating group outcomes. In other words, the Internet, along with face-to-face communication, provides a means for mixed-mode groups to initiate and maintain communication with external social actors as part of the group strategy for securing resources. Hence, it makes theoretical sense to conclude that the Internet has become incorporated in the adapted organizational practices of mixed-mode groups and that group impacts are likely accomplished through these efforts.

Because of technical difficulties related to survey administration, survey respondents were asked only about the general resources they received from contacts and not about the specific resources involved. Moreover, in this study, the measurements of network embeddedness and resource acquisition did not differentiate among face-to-face and electronic means. Future research should include granular inspections of the content of network communication and resource acquisition to better understand how mixed-mode groups interact with their environments. Specifically, studies can pay more attention to the degree of multimodal communication and the resulting group impacts.

Practical Implications: Leadership and Collaboration

A number of suggestions for organizing and managing a sustainable mixed-mode group are derived from this research. First, in addition to the importance of external links, the results of this study pointed to the fact that group organizers play a crucial role in the maintenance of

group operation and generation of group impacts. Building on internal and external strategic choices, group organizers can further adjust groups' relationships with other Meetup and non-Meetup groups and organizations, which in turn resulted in the coevolution of groups and the external environments in the form of producing impacts. Indeed, previous research on civic associations has heightened the role of leadership in influencing group activeness (Andrews et al., 2010). Echoing this line of work, this study yields another piece of empirical evidence showing how group organizers and leadership shape a mixed-mode group's level of activeness and group impacts. Although a direct determination is beyond the scope of this research, it is assumed that leadership can take various forms in the collective action of mixed-mode groups. Yet, a critical characteristic involved in such leadership is the ability to adapt the group to both internal dynamics and the external environment.

The findings of this study also indicate that implementing different types of strategies for internal and external coordination and communication is useful for maintaining a group's embeddedness in the network environment, which in turn helps obtain resources for group operation and produce group impacts. In particular, mixed-mode groups should be treated as open systems that not only are subject to the influence from the environment but also interact with the environment in order to get resources to survive (Katz & Kahn, 1978). A mixed-mode group can use both the group website and the offline meetings to facilitate the transfer of resources from internal to external, and vice versa. In other words, multimodal strategies for coordination and communication are recommended for organizing a contemporary voluntary group. Additionally, maintaining certain types of relationships with other online and mixed-mode groups, local venues, and local organizations helps facilitate smooth and successful

organizing. The benefits of having these external ties can be realized in a variety of ways, such as cross-postings, joint events, and sponsorship.

Limitations and Conclusion

There are several limitations of this study. First, the small-to-moderate sample size and uncertainties over true respondent randomness led to the selection of non-parametric PLS for statistical analysis and recognition that the findings may be interpreted with caution. Second, the measurements of the variables used were drawn mostly from the previously conducted interview data. Though this argues for their concurrent validity, it was not possible to gain independent validation of them in this context. Future efforts should focus on integrating established scales. Third, due to resource and time constraints, this study could only collect data at the group level, so group organizers were the ones providing responses to the survey questions. Yet, in defense of this approach, it was observed that, on behalf of the group, the group organizers were capable of answering the questions related to group development and the strategies used, and they also had the best knowledge of group interaction with external actors. Fourth, a cross-sectional survey limits causality claims, as is the case with all research derived with this method.

Despite these limitations, this study makes theoretical contributions by comparing collective action and ecological theories to answer two important questions in the contemporary society: how is collective action performed by new forms of human associations and with what effects. This present study suggests in the context of a digitally networked society that there are advantages to using ecological theories relative to collective action theories to understand the emerging technologically enabled behaviors at the interstice of organizational processes and human communication. A reason why ecological theories should be applied is because theories

of collective action mostly focus on the generation of public goods, especially in either online or face-to-face forms, but not on how public goods facilitate group outcomes.

Given the importance of voluntary associations in society on various levels, these theories cannot explain how public goods actually "do good" in society. In ecological theories, a common understanding is that both choice and determinism are important in influencing organizational behaviors. The findings reported here seem to confirm the utility of the ecological perspectives by showing the interaction of strategic choices and environmental constraints involved in the collective action of Meetup groups, which in turn influenced the group as well as the local community. Hence, in this increasingly important context, theories of organizational ecology are a better framework for understanding collective action because they can account for behaviors at both individual and organizational levels, and for mutual influence between the group and the environment.

Notes

1. More details about the interviews and the findings from the interviews were reported in one of the authors' two other papers, which were presented at the annual conference of the International Communication Association in 2011 and 2012. One of the papers is in press.

2. Meetup.com provided the information about the age distribution in Meetup groups and helped generate the sample.

3. Nonresponse bias analysis was conducted by comparing the earliest and latest third of respondents for each of the variables. No significant differences were found between these two groups of respondents on any of the variables.

4. In the network embeddedness, six items (NE1-6) were included. The item of communication with personal contacts was not included because of its low factor loading (.569). Including this item also reduced the AVE of network embeddedness below the threshold of .50.

5. Six network contacts were included: group members, other Meetup groups, local venues, other groups/organizations, personal contacts, and members of other Meetup groups. One of the six items (DR1) had a factor loading below .60 (.502), but it was still included considering the construct validity of this measurement. Moreover, the AVE was still above the threshold of .50 when including this item.

6. $F= [(R_2^2 – R_1^2)/(k_2 - k_1)]/[(1-R_2^2)/(N - k_2 -1)]$➔$[(0.234-0.107)/(7-3)]/[(1-0.234]/171-7-1]=6.756$,with [(7-3),(171-7-1)] degrees of freedom. $R2^2$ is for the superset model that includes the set of main predictors, $R1^2$ is the baseline model, k_2 is the number of predictors for the superset model, k_1 is the number of predictors for the baseline model, and N is the sample size. See Chin (1998, 2010). GoF=sqrt(average(AVE)*average(R^2)) = sqrt (0.613*0.377)= 0.614 (Tenenhaus et al. 2005).

7. Despite the limitations, the proposed model was run with AMOS to ensure its validity. The results were comparable to those from the analysis with PLS (Smart PLS).

8. To further determine the significance of the indirect effects, bootstrapping simple mediation was used with 5,000 bootstrap resamples (Hayes 2009; Preacher & Hayes 2008). Results showed that the indirect effects of both types of strategies on resource acquisition through network embeddedness were significant, because zero was not contained in the intervals. Thus, the total effects of external strategies on resource acquisition were ascribed to both direct and indirect effects; in contrast, the total effects of internal strategies on resources were mainly attributed to the indirect effects. Nonetheless, the total indirect effects of both strategies on group impacts were not significant. A further examination showed that the indirect effects of these mediating variables (network embeddedness and resources) did not differ from each other significantly, because zero was contained in the intervals. Therefore, it is suggested that the total effects of internal strategies on group impacts were primarily ascribed to the direct effects; in contrast, the total effects of external strategies on group impacts were attributed more evenly to direct and indirect effects, even though none was significant.

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