LIVING HISTORY WITH THE INTERNET

PROBING THE SUSTAINABILITY OF MIXED-MODE GROUPS

THROUGH AN ECOLOGICAL AND EVOLUTIONARY LENS

by

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ABSTRACT OF THE DISSERTATION
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This research investigates mixed-mode groups. These are a growing phenomenon of voluntary associations that are Internet-established but operate on an in-person basis. Using Meetup.com as the research site, this study uses several approaches to analyze the evolution and ecology of mixed-mode groups at group and population levels. Specifically, through analysis of interviews with 34 Meetup organizers, the iterative processes of variation-selection-retention (V-S-R) were discerned, manifested in the formation and continuity of Meetup groups. Drawing on concepts from theories of collective action, the resulting consequences for growth and survival of groups were analyzed. Further, a longitudinal analysis of 100 randomly selected Meetup groups showed the V-S-R processes taking place at the population level. Consistent with the existing research on organizational ecology and evolution, the results suggest that the
most relevant predictors of group survival included: the ecological factor in the form of population density; demographic factors represented by group age, profit orientation, and leadership; and external links. All were critical in predicting the survival of the 100 Meetup groups observed over 18 months.

This research also addresses the impacts of mixed-mode groups. Analysis of an online survey with 171 Meetup group organizers yielded insights into the strategies used by groups as well as the external activities involving network contacts, which engendered positive outcomes at the collective level. Both internal and external strategies had significant effects on outcomes. However, the modeling results indicate that while internal strategies had direct effects on group impacts, external strategies had more circuitous and additive effects on group impacts.

In unraveling the influence of different levels of mixed modality on group impacts, a multi-group analysis was conducted. The results showed that network communication played a critical role in mediating the relationship between the use of strategies and receipt of resources across high and low mixed-mode subsamples. The high mixed-mode subsample was also observed to have the flexibility of solely implementing internal strategies to generate group impacts, or using external strategies and network resources to do so. In contrast, in the low mixed-mode subsample, focusing more on different strategies alone would appear to help accomplish the desired outcomes.

Building on the findings, this study has made analytical and theoretical contributions to the existing research. Practical and policy implications of this study are delineated as are the analytical and methodological limitations. Based on the findings and implications derived from this study, future directions of research are suggested.
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But despite this excitement, I started this research project with uncertainty and trepidation because, in my opinion, it was such a promising, and, to some extent, ambitious undertaking. Fortunately, I had received valuable advice and continued encouragement from Prof. Katz, who always trusted me and guided me to the correct direction. I was also lucky to have Dr. Marya Doerfel and Dr. Jennifer Gibbs on my committee. Dr. Doerfel inspired me with the idea of using the ecological and evolutionary perspective as my framework. Thanks to Dr. Doerfel, I also found a suitable place to position myself as an organizational communication researcher. I was grateful that I had the experience of working with Dr. Gibbs when I first started my doctoral years at School of Communication and Information. From her, I have learned how to stay resilient and be as rigorous as possible when conducting research, which I constantly reflected on during the course of this project. I also want to thank my outside member, Prof. Barry Wellman, who had given me insightful suggestions and comments not only on my dissertation but also on my long-term scholarship.
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Executive Summary

This research investigates mixed-mode groups. These are a growing phenomenon of voluntary associations that are Internet-established but operate on an in-person basis. Examples of mixed-mode groups are groups created on Meetup.com, Facebook, Twitter, Craigslist, and BigTent. Similar to traditional voluntary associations, mixed-mode groups have the characteristics of voluntary involvement, specialization of interest, low degree of organization, private organization, being avocational, and of secondary importance to an individual’s social activity (Warner, 1972). Yet, what makes mixed-mode groups special is the flexibility of creating and participating in associational activities through the Internet. Moreover, mixed-mode groups are afforded the capacity to organize grouping activities across different media modalities.

Inheriting the vulnerability problems of both voluntary associations and online groups, mixed-mode groups may often be transitory, resulting in minimal impacts. Nonetheless, participation in voluntary associations and online communities has been positively linked to individual well-being as well as coordinated action (e.g., Klein, 1999; Newton, 1997; Putnam 1993; Rheingold, 1993). Therefore, looking into the sustainability of mixed-mode groups has its significance in formulating solutions to maintain social dynamics through associational activities in contemporary society. In light of this, this study delves into the sustainability of mixed-mode groups, relying on the ecological and evolutionary perspective as the theoretical framework.

Given the nascent nature of the topic, this study fuses together concepts and theories from a wide range of disciplines and concentrations, including sociology, management, political science, and, certainly, communication encompassing research
areas of group, organizational and computer-mediated communication (CMC). Using Meetup.com as the research site, this study analyzed the evolution and ecology of mixed-mode groups at group and population levels. The interview data provided insights into the micro-evolutionary process on the part of the groups while the longitudinal analysis of groups informed the structural factors affecting survival across groups. Through analysis of interviews with 34 Meetup organizers, the iterative processes of variation-selection-retention (V-S-R) were discerned, manifested in the formation and continuity of Meetup groups. Drawing on concepts from theories of collective action, the resulting consequences for growth and survival of groups were also analyzed. Further, a longitudinal analysis of 100 randomly selected Meetup groups showed the V-S-R processes taking place at the population level, which in turn helped identify the organizational forms that existed and which ones were selected and retained in the population. Consistent with the existing research on organizational ecology and evolution, the results suggest that the most relevant predictors of group survival included: the ecological factor in the form of population density; demographic factors represented by group age, profit orientation, and leadership; and external links. All were critical in predicting the survival of the 100 Meetup groups observed over 18 months. In other words, the evolutionary processes have led to the selection of older, not-for-profit groups, living under lower population density of other groups, and surviving with a leadership team and leadership change, in the population of Meetup groups. Those selected and surviving groups also tended to maintain external links with other groups within and/or outside the population of Meetup.com.
This research also addresses the impacts of mixed-mode groups. Analysis of an online survey with 171 Meetup group organizers yielded insights into the strategies used by groups, as well as the external activities involving network contacts, which engendered positive outcomes at the collective level. Both internal and external strategies had significant effects on network communication, which in turn affected resources obtained (diversity and density of resources from network contacts). Both types of strategies also had significant effects on group impacts; yet while internal strategies had direct effects on group impacts, external strategies had more circuitous and additive effects on group impacts. Additionally, group age and meeting frequency were found to be significantly related to perceived group impacts. Older groups and groups with more frequent face-to-face meetings were more likely to perceive positive group impacts achieved at the collective level.

In order to unravel the influence of varying degrees of mixed modality on the organization and operation of mixed-mode groups, a multi-group analysis was conducted. The results of this analysis showed that network communication played a critical role in mediating the relationship between the use of strategies and receipt of resources across high and low mixed-mode subsamples. But a main difference was that the high mixed-mode groups had the advantage of using external strategies to acquire resources for group operation, which may be directly or indirectly received from network contacts. The importance of internal strategies was less significant in this regard for this set of groups. For the low mixed-mode groups, using external strategies, coupled with more frequent communication with network contacts, would be an effective way to get resources. In terms of using strategies to generate group impacts, the high mixed-mode groups had the
flexibility of either solely implementing internal strategies to achieve such effects, or relying on external strategies and getting resources via network contacts to do so. In contrast, in the low mixed-mode subsample, focusing more on the use of different strategies alone would appear to help accomplish the desired outcomes. These results together indicate that mixed-mode organizing is a capacity that can help groups to become embedded in the larger environment as well as achieve impacts, internally and externally.

Building on the findings, this study has made analytical and theoretical contributions to the existing research. Specifically, it posits that employing an ecological and evolutionary perspective has the advantage of identifying the evolution of mixed-mode groups at multiple levels. Special attention is given to conceptualize how this perspective and technological affordances of mixed-mode organizing mutually influence each other. Examining the impacts of mixed-mode groups also helps enrich existing research on the Internet and social capital by providing theoretical reasons as to why and how Internet use facilitates the creation of social capital; it also suggests a communication-centered view of social capital. Methodologically, by using a sequential and mixed-methods approach, this research illuminates the evolution of organizations in an innovative way. Practical and policy implications derived from this study are also delineated. For example, findings provide insight as to how to manage and organize sustainable groups; they also help shed light on the potential of incorporating mixed-mode groups in policy consideration promoting community development. Based on the findings and implications, future directions of research are illustrated and suggested.
Chapter 1
Introduction

Voluntary Associations and the Internet

An enduring question in contemporary society is whether, and how, voluntary associations in society are enabled or constrained due to the growing use of new media technology (Putnam, 1993). But in fact, participation in voluntary associations has a long history in human society. Since the Neolithic era (around 7000 B.C.E.), the emergence of formal voluntary associations (solidarities) allowed people to create relationships based on shared interest outside of kinship or coresidence ties (Anderson, 1971). At that time, these common-interest based associations were mostly related to religious purposes, such as secret rites. Thousands of years later, in the industrial age (encompassing the 18th and 19th Century), voluntary associations became the haven for the emerging working class to seek cooperation and engage in activity sustaining traditional values, such as clubs and ethnic associations (Anderson, 1971). As well, they became instruments of social and ideological change and resistance.

In modern times, voluntary organizations have continued to play a vital role in all levels of Western-style liberal democracies. In the United States in particular, voluntary organizations are quite prominent. A 2011 national survey found that 75% of American adults are active in some type of voluntary group/organization (Rainie, Purcell, & Smith, 2011). It appears that it is human nature to join voluntary associations despite changing socio-historical contexts; but in any event voluntary associations certainly are characteristic of contemporary liberal democracies, and may even be vital to their
survival (e.g., Babchuk & Booth, 1969; Clark, 1991; Lipset, Trow, & Coleman, 1956; Morris, 1986).

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). 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 such as professional and alumni associations. Because of these associations, people are provided an opportunity to gather to create or participate for collective benefit (Bishop & Hoggett, 1986). Voluntary associations have the characteristics of voluntary involvement, specialization of interest, low degree of organization, private organization, being avocational, and of secondary importance to an individual’s social activity (Warner, 1972). In other words, these 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).

In fact, these characteristics can make it difficult for voluntary associations to grow and survive. A common problem for voluntary associations is a short life-span, because while they are easy to create, they are also easy to dissolve (Smith, 1997, 2000). Moreover, voluntary associations are likely to suffer from a lack of member commitment, lower priority than members’ individual goals, insufficient group size and resource base, and a lack of complex structure to cope with internal relationships and external environments (Harris, 1998; Knoke & Prensky, 1984). On the other hand, participation in voluntary associations has long been linked to a wide variety of individual and
collective benefits, including improved political participation (Rogers, Bultena, & Barb, 1975), generation of social capital (e.g., Coffe & Geys, 2007; Putnam, 1993, 1995, 2000; Stolle, 1998; Wollebæk & Selle, 2002; Wollebæk & Strømsnes, 2008), formation of social ties and occupational diversity (Davis, Renzulli, & Aldrich 2006; Lauer & Yan, 2010), assimilation of democratic values and attitudes (Hooghe, 2003; Tocqueville, 1968), and social integration (Babchuk & Edwards, 1965).

Unlike in past epochs, contemporary society is equipped with various information and communication technologies (ICTs), especially the Internet, which renders it relatively easy for people to build and maintain relationships and engage in social activity in different modalities (Katz & Rice, 2002; Wellman & Gulia, 1999; Wellman, Haase, Witte, & Hampton, 2001). Yet the importance of face-to-face interaction in associational activities has not been reduced. Use of ICTs is positively related to the likelihood of belonging to a local voluntary group such as a neighborhood association, sports league, youth group, church, or social club (Hampton, Sessions, Her, & Rainie, 2009).

In the meantime, despite the prevalence of Internet use for different purposes of voluntary associations, most research thus far focuses on online groups, which are characterized by dominant online activities with sporadic face-to-face group interaction (e.g., Baym, 2002; Brandon & Hollingshead, 2007). Little is known about how traditional face-to-face voluntary associations can be facilitated or enabled through these uses of technology. Further, it is suspected that the lower costs of entering and exiting online organizing activities may result in even higher mortality rates for either online or Internet-established groups. Hence, to understand how people use technology to satisfy
their need for voluntary associations, it becomes salient to investigate how and why these groups survive over time, which is the focus of this research.

**The Phenomenon of Mixed-Mode Groups**

This study aims to shed light on the sustainability of voluntary associations which though Internet-established operate on an in-person basis. These have also been called electronic-to-face (e2f) groups (Weinberg & Williams, 2006). But considering their broad scope of group topics (e.g., profit-based, networking, social, hobbies, service), mixed uses of media modalities (e.g., the Internet, face-to-face), and varying levels of structure (e.g., formally vs. informally structured, small groups and large organizations), these groups are thought to be more appropriately labeled as “mixed-mode groups.”

Most importantly, the term of mixed-mode groups has its conceptual root in the notion of mixed-mode relationships (MMR), which refers to the occurrence of mode-switching of interpersonal interaction and relationships from online to offline (Walther & Parks, 2002). Examples of websites enabling mixed-mode groups include *Facebook*, *Craigslist*, *Twitter*, *Meetup.com* and *BigTent*. It is believed that, compared with the common term “online groups” in existing research, which is suggestive of groups focusing on the Internet as the main venue for communication and activity (Matzat, 2004), the definition of mixed-mode groups proposed here underscores the consideration of contexts and modalities in examining group interaction.

Similar to traditional voluntary associations, mixed-mode groups have the characteristics of voluntary involvement, specialization of interest, low degree of organization, private organization, being avocational, and of secondary importance to an individual’s social activity. Yet, what makes mixed-mode groups special is the flexibility
of creating and participating in face-to-face associational activities through the Internet. Further, mixed-mode groups are afforded the capacity to organize grouping activities across different modalities.

Inheriting the vulnerability problems of both voluntary associations and online groups, mixed-mode groups may often be transitory, resulting in minimal impacts. Nonetheless, participation in voluntary associations and online communities has been positively linked to individual well-being as well as coordinated action (e.g., Klein, 1999; Newton, 1997; Putnam 1993; Rheingold, 1993). Therefore, looking into the sustainability of mixed-mode groups has its significance in formulating solutions to maintain social dynamics through associational activities in contemporary society. This study delves into the sustainability of mixed-mode groups, relying on the ecological and evolutionary perspective as the theoretical framework.

Given the focus of this study on survival of groups, an evolutionary and ecological perspective (Campbell, 1965; Hannan & Freeman, 1977; McPherson, 1983a) is used to provide a general framework to understand the phenomenon of mixed-mode groups. The ecological and evolutionary perspective examines 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. Further, it is conjectured that for voluntary associations to endure, the continuing availability of certain types of associations matters more than the persistence of any particular voluntary associations; that is, the survival of the species supersedes the life of an individual (Smith, 2000). This claim touches on the evolutionary process taking place at an aggregate level, which is also the focus of the
ecological and evolutionary perspective. As such, it is an appropriate theoretical choice to tackle the subject of mixed-mode groups’ sustainability.

**Impacts of Mixed-Mode Groups**

If mixed-mode groups can survive longer, they are more likely to produce impacts, whether internal or external to the group. Voluntary associations are often seen as providing benefits not only to their members but also to the wider public; hence, the way they are organized can be understood as part of their local organizational ecology (Harris, 1998; Milofsky, 1987). A 2011 Pew study revealed the importance of the Internet in contributing to the impact of voluntary groups on different levels: 68% of people believe the Internet has had a major impact on the ability of their groups to communicate with members, 59% think the Internet has played a role in their groups’ ability to impact society at large, and 49% consider their groups have the ability to impact local communities because of the Internet (Rainie et al., 2011). But research has not kept up with the growing importance of the Internet and other ICTs in facilitating the impact of voluntary associations, especially that of mixed-mode groups.

Leaving aside the technological affordances, there has been much discussion with regard to the importance of external links to the operation and organization of voluntary associations. It is a common observation that voluntary associations tend to establish connections of some sort with external organizations and businesses (Smith, 2000). Having certain interorganizational linkages, such as those with local organizations and businesses and other voluntary associations, is also considered a useful way to foster greater longevity for voluntary associations (Selle & Øymyr, 1992). It becomes evident that investing in interorganizational networks amounts to building an organizational
capacity, which in turn aids associations’ program activity (e.g., endorsing candidates, holding demonstrations) and organizational outcomes (Andrews, Ganz, Baggetta, Han, & Lim, 2010).

Notably, building and maintaining interorganizational networks and links means that an organization attends to its relationship with the environment, from which the organization can acquire resources necessary for operation. In uncovering the impacts of mixed-mode groups, an ecological and evolutionary view is drawn on to delve into the organization-environment relationship and examine how groups engage in strategic actions to generate impacts by being embedded in the environment. Specifically, by referencing resource dependence theory and boundary spanning research, attention is directed to mixed-mode groups’ active configuration of strategies in utilizing interorganizational relationships, which affects group outcomes.

**Research Site: Meetup Groups**

The data were collected from Meetup.com, a website designed to facilitate the creation of groups and coordination of offline group meetings among participants based on shared interest and physical location, that is, the formation and organizing of mixed-mode groups. Known as the biggest website of mixed-mode groups, Meetup.com sits on a user base of over 9 million users and 90,000 local groups, which span 45,000 cities across the globe. More importantly, Meetup.com fits the needs of this study because it contains a complete history of group activities, whereas similar services such as Craigslist and Facebook do not. Due to the exploratory and complex nature of the topic, data collection and analysis were implemented as a sequential mixed methods approach, including qualitative interviews with 34 Meetup group organizers, a longitudinal analysis
of 100 Meetup groups and an online survey with 171 Meetup group organizers. Specifically, analyses from the interviews as well as the archived data were used to identify the variables investigated in the online survey.

The structure of the content is as follows: Chapter 2 summarizes a literature review of the ecological and evolutionary perspective, from which hypotheses and research questions are developed. Chapter 3 details the research site Meetup.com and the procedures of data collection and analysis. Chapters 4 to 6 present the results from the analysis of multiple sources of data, including interviews, archived group data, and the online survey. The last chapter, Chapter 7, contains further elaboration of the various aspects of contributions made by this research.
Chapter 2

Literature Review

In our standard procedure for analyzing social behavior, we ask first: What is the nature of the group’s environment? And next: Given that the group is surviving in the environment, what are the limits that this condition places on the interactions, sentiments, and activities of the group? …Answering these questions, in whatever form they are put, is the first step in the study of a social system. The environment may be broken down into three main aspects: physical, technical and social, all of which are interrelated, and any one of which may be more important than the others for any particular group (Homans, 1950, p. 88).

Adaptation is the name we give to the parallelism between what successful operations on the environment may require and what the organism itself creates. Adaptation is as characteristic of the group as it is of other organisms (Homans, 1950, p.155).

The Ecological and Evolutionary Perspective

The notion of ecology of organizations has been long explicitly and implicitly mentioned in the literature across different disciplines. Homans’ (1950) early remarks, listed above, point out that when studying a social system, “what is the nature of the group’s environment” is the first question the researcher needs to ask. In other words, it is necessary to look at the group’s environment consisting of physical, social, and technical aspects, which are themselves interrelated and valued differently depending on the group. In the meantime, his other short excerpt touches on the necessity of considering adaptive processes in characterizing human groups. In sum, the focus is on how a social organization is influenced by the surrounding environment and how it acquires resources to adapt itself to the environment. These two inquiries constitute the essence of the ecological and the evolutionary perspective, respectively, that is, selection.
and adaptation, which are now seen as complementary to each other and integrated in recent research (Baum & Shipilov 2006; Meyer, 1994). An ecological and selective perspective focuses on the selection mechanism of certain organizational characteristics that fit the environmental demands (e.g., Hannan & Freeman, 1977; Kaufman, 1975), while the evolutionary and adaptive counterpart highlights the active and adaptive processes enacted by organizations as they evolve (Burgelman, 1991; Meyer, 1994).

A combined approach of the ecological and evolutionary perspectives explains how the social and environmental conditions, as well as the interaction within and among populations of organizations, influence organizational founding, failure, and change (Baum & Shipilov, 2006). It examines the process of how communities and the populations of organizations that constitute them struggle to acquire resources in order to survive; in other words, the subject of interest is the process of how organizations pursue the goal of fitness by means of interacting with other members in their communities and populations as well as interacting with their environments (Campbell, 1965; Hannan & Freeman, 1977). Specifically, organizational change is realized through the mechanisms of variation, selection, and retention (V-S-R) (Aldrich, 1979; Campbell, 1965; McKelvey, 1982). Generally, organizations are faced with different opportunities and challenges after being established, which is the source of variation. Some variations will be selected and retained as part of the organizational practices for survival.

Integral to organizational survival is the development of communication infrastructures, as manifested in the process of building and maintaining communicative relations and networks interconnecting members of the community (Monge, Heiss, & Margolin, 2008; Monge & Poole, 2008; Monge et al., 2011a). The process of
coevolution is also salient, through which a set of populations (an organizational community) coevolve with each other and with their environment (Baum & Rao, 2004; Monge & Contractor, 2003). A community may reside in a certain local geographic area or may cover different levels of economies, depending on its technical or institutional core (Baum & Rao, 2004).

The ecological and evolutionary perspective has also been applied in the context of voluntary associations. For example, McPherson’s (1983a, 1988, 2004) ecological model of affiliation takes into account the influence of environmental factors (e.g., time, physical locations, socio-demographic variables) on the survival of voluntary organizations. Referencing the notion of “niche” from the model of population ecology (Hannan & Freeman, 1977), McPherson (1988) views the niche in biological terms as “a location in a multidimensional property space defined by the resources in the environment: what the animals eats, where it eats, and when it eats” (p. 43). Translating these descriptions into the language of human groups, these three dimensions correspond to human group membership (social context), the physical location of groups (physical context), and the time investment on group activities (temporal context), respectively. In this niche space (or called Blau space), a group is surrounded by other groups that will shape a given group’s growth or decline, changes in composition, and even its survival (McPherson & Ranger-Moore, 1991).

It is worth mentioning that social networks figure prominently in McPherson’s (1983a) ecological model of affiliation and the model of organizational ecology (Monge et al., 2008), but the level of inquiry differs. McPherson’s model considers the mechanism of homophily in shaping the composition of voluntary organizations
Organizations (members) tend to recruit new members from their existing social networks, which in turn reinforces the attributes and characteristics of the membership.

In contrast, the model of organizational ecology pays attention to communication exchanged between organizations and the evolution of communication networks at organizational, population and community levels following the V-S-R mechanisms (Monge & Poole, 2008; Monge et al., 2008).

**Ecology and Evolution of Internet-enabled Groups**

Despite its growing attention in the communication field, the ecological and evolutionary perspective has not been adequately applied in research on online or mixed-mode groups. In fact, theoretical frameworks abound that try to tease out the factors behind why and how online groups operate and succeed (Iriberri & Leroy, 2009). But these topics tend to narrowly focus on groups that exist online (Burnett, 2000; Butler, 2001; Lazar & Preece, 2002; Postmes, Spears, & Lea, 2000; Preece, 2001; Rheingold, 1993). Furthermore, research is concentrated in information system designs or variables about group members’ motivations and contributions (e.g., Butler, Sproull, Kiesler, & Kraut, 2002; Jin, Cheung, Lee, & Chen, 2007; Koh, Kim, Brian, & Bock, 2007; Leimeister, Sidiras, & Krcmar, 2006). Thus, this line of work fails to attend to the ecology of Internet-enabled groups by incorporating possibly contextual factors (e.g., social, physical, temporal), so little systematic knowledge is gained as to how these groups grow, decline or disband. Hence, the aim here is to fill the gap by applying an evolutionary and ecological perspective to understand the evolution of mixed-mode groups.
It is apparent that the fluid, informal structures and multimodal characteristics of mixed-mode groups differentiate them from well-structured, formally bounded organizations, which are the common subjects of investigation by the ecological and evolutionary research. But the multilevel feature of the evolutionary perspective (Monge & Poole, 2008) lends itself to the examination of change within and across populations of organizations, and that may include the evolution of groups and populations of groups. Moreover, by considering the interaction and relationships between organizations and their environment, an ecological and evolutionary perspective can help explain the technological affordances of multimodal interaction in the evolution and survival of mixed-mode groups.

In fact, consistent with this cross-level characteristic, a growing line of small group research adopts a network approach to examine interconnections between groups at individual and group levels beyond the pre-set group boundaries (Lazer & Katz, 2003; for a review of the synergies between research on groups and networks, see Katz, Lazer, Arrow, & Contractor, 2004). Empirical research integrating group and network literature is still lacking; in the realm of the Internet, there are only a few studies making such attempts (e.g., Postmes et al., 2000; Vaast, 2004; Wellman & Gulia, 1999). Furthermore, this work tends to examine inner contexts (e.g., member attraction, group norms) or cross-level contexts (e.g., knowledge sharing from group-level to network-level), with scant attention paid to the dynamic and over-time group change, the point at which the evolutionary perspective can adequately fill in. Because of the multimodal nature of mixed-mode groups crossing online and face-to-face contexts and their varied structural characteristics, three research questions are proposed, drawing on literature from
evolutionary theories on organizations, online groups, and traditional small groups grounded in face-to-face settings.

**Formation of Groups**

From the evolutionary perspective, groups experience the processes of variation, selection, and retention as the basis of change and survival in the environment (Campbell, 1965). These processes together can adequately reflect the changing attributes of organizations, populations, and communities (Monge et al., 2008). In mixed-mode groups, potential variations could come from the efforts of recruitment and advertisements, state of member attendance, interaction with other groups and the physical environment, organizing structure and the content of group activities. Some of these trial-and-error experiments will be then selected and retained as part of regular group operation.

A common theme that has been studied in relation to the emergence of new organizations and groups is recruitment. Under the ecological perspective, groups sustain themselves through a specific recruitment process. Groups tend to recruit potential members through their existing members’ social contacts (or people who are similar to them) in hopes of maintaining the group “niche” in the population (McPherson et al., 1992; Popielarz & McPherson, 1995). Among the few studies that have attempted to delve into the influence of recruitment on performance of online groups, Bateman’s (2008) study indeed found that new members who joined the online community through referrals were more likely to participate actively in the online community, compared with non-referred newcomers. It is, however, possible that, in addition to the traditional network referrals, mixed-mode groups rely on different sources of recruitment, most of
which may pertain to online searching. Therefore, it may be argued that network ties do not necessarily play as an important role in mixed-mode group recruitment as they do for traditional voluntary associations.

Interestingly, compared with social contexts, discussions about physical contexts in online groups have attracted even less attention. One reason for this discrepancy may be associated with the well-known characteristic of the Internet in facilitating communication easily across time and space. Nonetheless, although many online groups are organized across different geographic regions, many others are established among people connected due to physical proximity (e.g., Facebook, Foursquare, Meetup.com). In the language of the ecological model, physical locations can become a source of competition among groups striving to recruit members in the same geographic area (McPherson, 1983a). For this reason, it is likely that local-based groups tend to have overlapping memberships with cosmopolitan groups which have a relatively wider geographic recruitment base (Richmond, 2003).

Research has shown that face-to-face groups often form based on physical proximity (Arrow, McGrath, & Berdahl, 2000; Moreland, 1987) and groups are inclined to recruit members from geographically neighboring areas at a higher rate than from distant places (McPherson, 1983a). The geographic orientation of groups will thus impose a level of constraint on the composition of membership, in that neighborhood-type associations tend to utilize social networks within the local area while non-geographically related associations do not (Glanville, 2004). The physical location may also influence the formation of certain types of groups. For example, life stress groups (e.g., divorce, bereavement) are likely to be organized in suburban areas (Maton, 1993).
In sum, considering how environments may influence the formation of mixed-mode groups, the first research question asks (see Figure 2-1 for an overview of the research questions):

RQ1: How are the processes of V-S-R (e.g., the way a group starts, the way a group recruits members, the locale where a group is) reflected in the formation of mixed-mode groups?

**Continuity of Groups**

In the face-to-face group literature, conceptualizations of sustained groups are diverse, compared with those in the online group research. Basically, group continuity can be observed in different ways, such as through the patterns of attendances over time, change of membership size, and member duration. Distinguishing two types of groups as standing and acting groups, Arrow and McGrath (1993) explain that group continuity can take the form of stable attendances or stable memberships. The former is a characteristic of acting groups (e.g., an ad-hoc sports team) while the latter is characteristic of standing groups (e.g., family) (McGrath, 1984). Membership size has also been discussed in relation to group stability (McPherson, 1983b) and group functionality (Arrow & McGrath, 1993). For example, it is contended that having three people showing up at a group meeting indicates a positive sign of continuity for a group of six, but does not necessarily mean the same for a group of 12.

In the online group domain, groups that mainly exist online may be faced with high drop-off rates due to easy entry and penalty-free exit (Sander, 2005). This problem has been addressed through different strategies. For example, repeated interactions, coupled with strong group boundaries, can serve as motivators for members to participate
in group activities (Kollock, 1999). And if possible, offline interaction is helpful for members to develop social relationships as a basis for engaging in group activities (Alon, Brunel, & Schneier Siegal, 2004; Butler et al., 2002; Koh et al., 2007; Rothaermel & Sugiyama, 2001) as well as motivation for returning to the group (Sander, 2005).

Similarly, face-to-face meetings were found to be positively related to attending members’ ongoing contributions to the online community and preferred interaction with other members who also attended the meetings (Sessions, 2010).

The majority of research is concentrated on the internal mechanism of online groups, but little is known as to whether and how an online group’s interaction with other groups/entities and the environment influences the fate of the group, which is salient under the ecological and evolutionary perspective. In fact, the ecological notion of cooperation and competition between populations of organizations has recently been adopted in online group contexts. Wang, Butler, and Joyce (2006), for example, investigated intergroup competition in the form of co-existing online groups. They found that in groups that shared much content with other groups (cross-posting groups) and that had a large proportion of their members in other groups (membership overlap rate), there was a high likelihood that fewer existing group members would return to the group in the following session. These findings suggest that groups may interact with each other indirectly in the larger online environment, in turn influencing the survival of the focal group.

In addition to interacting with other groups, the continuity of a mixed-mode group is likely to be influenced by its connections with the physical locale. Research into the ecology of voluntary associations suggests that voluntary associations are more prevalent
in a social system with greater intercommunication networks (higher density, connectivity, duration of member relationships), greater differentiation of goals and interests among members, and the encouraging social milieu of collective action orientation (freedom of association, initiation of groups by organizers or existing groups, resources possessed by members, collective outcomes) (Smith, 1973). In light of this review, the second research question asks:

RQ2: How are the processes of V-S-R (e.g., interaction within and across groups, interaction with local venues) reflected in the continuity of mixed-mode groups?

**Collective Action of Sustained Groups**

From an ecological perspective, a group may survive through the formation and maintenance of intergroup links. Specifically, with more such links constructed, a group has greater capacity to detect and respond to changes in the environment and sees a greater probability to actually modify its environment (McPherson, 1983a). Put another way, behaviors of human groups will invariably affect the environment; for example, certain stores, restaurants, and bowling alleys are patronized because group activities take place in these places and money is spent in them (Homans, 1950). Topics about the outcome of surviving organizations have not been widely discussed in the extant evolutionary literature, which is thus far mostly concentrated in examining the mechanisms that may lead to organizational growth, decline, dissolution, and survival. Yet a sustained mixed-mode group arguably implies the performance of ongoing collective action, which may affect the group as well as its environment.

General theories of collective action seek to explain groups of people’s motivation and cooperation to perform collective action (Olson, 1965). Two streams of
theories are especially relevant to explain collective action carried out by groups, and the public goods theory is a widely cited one. Public goods theory is concerned with the explanation of collective human action, and examines the factors that contribute to the initiation of public goods. Public goods, by definition, refer to the outcomes of collective action taken by two or more people that end up benefiting the general public, some of whom do not even contribute to the goods’ creation (Samuelson, 1954). The other characteristic of public goods is that they are nonrival, meaning that one’s use of goods does not reduce the amount that other people can use. Examples of public goods include tangible (e.g., parks) and intangible ones (e.g., electronic databases). Applied in the technology-mediated contexts, public goods can take communal (information sharing) and connective (direct connections) forms through organizational information repositories (Fulk, Flanagin, Kalman, Monge & Ryan, 1996; Fulk, Heino, Flanagin, Monge & Bar, 2004; van den Hooff, 2004; Yuan, Fulk, & Monge, 2007; Yuan, Fulk, Shumate, Monge, Bryant, & Matsaganis, 2005). Nonetheless, thus far there are few attempts to extend these conceptualizations from task-oriented and formally structured organizational settings to self-organizing contexts such as online voluntary groups.

Relaxing the strict standard involved in the production and consumption of goods as posited in public goods theory, club theory focuses on the exclusion of collective goods (i.e., club goods) based on membership. A club refers to “a voluntary group deriving mutual benefit from sharing one or more of the following: production costs, the members’ characteristics, or a good characterized by excludable benefits” (Sandler & Tschirhart, 1980, p.1482). Hence, unlike public goods, club goods have the characteristic of exclusion; yet, similar to public goods, consumption of club goods is nonrival to the
extent that all participating members can have access to the benefits (Buchanan, 1965; Cornes & Sandler, 1996; Sandler & Tschirhart, 1980). For example, the activities that a sports team engages in are only available to the team members; however, within the team, each member is offered equal enjoyment. Nonetheless, it is possible that with more participating members utilizing the shared good, the problem of crowding may arise, which results in the reduction of the quality of the good (Sandler & Tschirhart, 1980).

Due to its focus on economic and rational aspects, club theory is often used along with other social theories in explaining self-organized groups (Arrow, Bennett, Crosson, & Orbell, 1999; Arrow & Crosson, 2003; Arrow et al., 2000). Few studies have been conducted to apply club theory to other group processes besides group formation. The conception of club goods, however, is believed to have great bearing on the sustainability of mixed-mode groups because it underscores the generation of membership-dependent club goods as a result of well-functioning groups. The third research question is thus developed to examine mixed-mode groups’ collective action, which asks:

RQ3: What are the forms and outcomes of collective action by sustained mixed-mode groups?

A Multilevel View of Ecology and Evolution

According to Baum and Shipilov’s (2006) review, current ecological and evolutionary theory and research tap into four levels (Baum & Singh, 1994a; Hannan & Freeman, 1989): \textit{intraorganizational ecology}, \textit{demography of organizations}, \textit{population ecology of organizations} and \textit{community ecology}. Intraorganizational ecology focuses on the V-S-R mechanisms enacted within organizations in the forms of strategic actions, rules and norms, explaining how these mechanisms influence the evolution and change of
organizations. Demography of organization investigates the regularity of the rates of organizational founding, change, and failure within populations and examines how these relate to organizational characteristics. Population ecology looks at the growth and decline of individual populations and seeks to explain how these vital rates of one population are influenced by factors within the population, interactions with other populations, and environmental changes. Community ecology examines how the interaction among a set of populations influences the persistence and stability of the community as a whole.

Building on Baum and Shipilov’s (2006) discussion and the multilevel feature of evolutionary theory, in the following sections, one research question and a set of hypotheses are developed with the aim of examining the ecology and evolution of mixed-mode groups at group and population levels. In response to the call for identifying V-S-R mechanisms at different levels of analysis (organizations, populations, community) (Monge & Contractor, 2003; Monge & Poole, 2008), a general research question first asks:

**RQ4:** What are the V-S-R processes in the evolution of mixed-mode groups at (a) the group and (b) the population level?

The Ecological Processes of Organizations

At the population level, research has primarily delved into the ecological processes of organizations (e.g., niche, density dependence) and the demography of organizations (e.g., age, size) (Baum, 1999). The term “niche” is proposed to explain that organizations and populations possess varied capacities to acquire resources and exploit these resources from the environment in order to survive (Hannan & Freeman, 1977;
McKelvey 1982; McPherson, 1983a; Popielarz & Neal, 2007). Niche width is further developed to refer to an organization’s variance in resource utilization; a dichotomy of generalists (with wide niche) and specialists (with narrow niche) is posited accordingly (Hannan & Freeman, 1989). Narrow organizational niches have been found to be positively correlated with mortality rates (Dobrev, Kim, & Hannan, 2001). Meanwhile, density dependence theory explains the relationship between competition and the number of organizations in a population, positing that increased competition may contribute to failure rates at different stages of population development (Hannan & Carroll, 1992; Hannan & Freeman, 1987, 1988, 1989). Specifically, the intensity of competition is greater between organizations with similar resource requirements (Hannan & Freeman, 1977, 1989; McPherson 1983a). For example, competition is more intense between organizations located in the same geographic region and targeting overlapping customers.

Organizations can maintain competitive and mutualistic relationships in a direct or diffuse way (Monge et al., 2011b). Direct competition and mutualism requires pairs of organizations competing for or cooperating with each other in securing resources; in contrast, the diffuse format involves the presence of many organizations anonymous to each other, which is often measured by the number of organizations in a population (Barnett & Carroll, 1987; Hannan & Freeman, 1989; Monge et al., 2011b). For instance, two organizations that provide similar products may engage in cooperation (direct mutualism) or competition (direct competition) with each other. Yet, within a large industry, many organizations are unknown to each other, and thus whose existence may be a form of diffuse competition or mutualism for each other. In the online domain, however, little research has explored the ecological processes of online groups at the
population level. In light of this, the following two hypotheses are developed based on existing ecological and evolutionary studies on formal organizations.

H1: Group niches affect the survival of mixed-mode groups.

H2: Population density affects the survival of mixed-mode groups.

The Demographic Factors of Organizational Survival

Several predictions have been proposed linking demographic factors in the form of age dependence to organizational survival, such as liability of newness (Freeman, Carroll, & Hannan, 1983; Stinchcombe, 1965) and the liability of adolescence (Brüderl & Schüssler, 1990; Fichman & Levinthal, 1991). These propositions have been extensively studied and tested to show how organizations are vulnerable at different stages of their life cycles (see a review of related research in Baum & Shipilov, 2006). Similarly, liabilities of smallness is another demographic prediction that claims that there is a high propensity of small organizations to fail due to various obstacles, such as problems of raising capital, recruiting and training a workforce, or meeting higher interest payments (Aldrich & Auster, 1986).

Nonetheless, mixed-mode groups, which are characterized by use of multiple media modalities and varied structures and topics, may embody different demographic processes than those commonly studied in the ecological and evolutionary research. First, the size of mixed-mode groups may appear ambiguous as a valid measure of organizational characteristics. On the one hand, group size is often examined as a factor influencing group success in the online group literature. Rothaermel and Sugiyama (2001), for example, argue that the relationship between a virtual community’s size and its success is curvilinear; up to a certain point, the incremental addition of new members
is positively related to the aggregated value of the community. Beyond a certain point, however, this increase dissipates. On the other hand, it can also be argued that online membership is easy to activate (Sander, 2005) and, to some extent, may be deceiving, which may render size of mixed-mode groups less accurate in terms of reflecting its actual influence, if any, on group survival. Given this concern, the inquiry regarding the liability of smallness is examined as part of the fourth research question, rather than a specific hypothesis.

Second, other demographic factors, such as profit orientation and leadership, may influence survival of mixed-mode groups. It is known that, unlike for-profit and well-organized organizations, not-for-profit voluntary associations are likely to rest on emotional attachments of members and low cost of continued activity, which may prevent easy organizational disbanding (Wollebæk, 2009). Fernandez’s (2008) study showed that Spanish nonprofit voluntary associations in Madrid were subject to the liability of smallness and newness and many were disbanded due to mission completion and resource insufficiency (human, physical). Chambré and Fatt’s (2002) study on non-profit AIDS organizations further indicate that new organizations closed due to the inability to secure stable funding sources as well as lack of experience. But at the adolescent stage, organizations were often faced with different problems, such as interpersonal conflicts, narrow focus, and leadership change, that led to organizational dissolutions.

As far as these findings concerning non-profit voluntary organizations may apply to mixed-mode groups, a conceptual distinction has been called for between paid-staff non-profit voluntary organizations and grassroots voluntary associations (Smith, 2000).
Having much resemblance to mixed-mode groups, grassroots associations refer to locally based, significantly autonomous, volunteer-run and voluntary altruism-based groups (Smith, 2000). Because of this distinction, more research is needed to identify the demographic factors that may influence the survival of grassroots associations, including mixed-mode groups. In consideration of these issues, three hypotheses are suggested.

H3: Older mixed-mode groups are more likely to survive than younger groups.

H4: Profit orientation affects the survival of mixed-mode groups.

H5: Leadership factors (e.g., leadership structure, leadership change) affect the survival of mixed-mode groups.

**Embeddness and Survival**

It is important to point out that institutional links may play a critical role in the predictions of organizational survival by age dependence. Baum, Calabrese, and Silverman (2000) found that biotech startups’ early performance was significantly related to their alliance network established at the time of their founding, which would determine the access to resources and stable exchange relationships. Embeddedness is the notion that refers to the situation in which economic actions of individuals and organizations are embedded in social relations, and this structure of a network of social relations among organizations would affect the operation of each organization involved in the network (Granovetter, 1985, 1992; Uzzi, 1999).

Institutional embeddedness has been shown to incur survival advantages for organizations because such ties to the environment can provide organizations with legitimacy and access to resources (Baum & Oliver, 1991, 1992). For example, Hager, Galaskiewicz, and Larson (2004) found that non-profit organizations in Minneapolis-St
Paul (USA) that had network embeddedness in the form of a broader scope of external funding sources were less likely to close. This aspect has also been examined in the context of voluntary associations. For example, Fernandez (2008) found that those Spanish voluntary organizations which were embedded in the collaborative networks of dense and weak ties to the rest of the non-profit organizations in the same field (i.e., possessing social capital) lived longer than those with less social capital (i.e., organizations without direct connections to other non-profits). On the basis of the longitudinal data, Selle and Øyemyr’s (1992) study showed that those voluntary organizations with less extensive external activities (less cooperation with other local non-profit organizations) and less integration into external environments were less likely to survive over time. Wollebæk’s (2009) study in Norway showed the positive effects of external ties on the survival of voluntary organizations, in the form of linking to outside funding sources, having contact with a municipality, and cooperating with other organizations. On the basis of these few empirical studies on embeddedness and survival of voluntary associations placed in non-US contexts, the next hypothesis is proposed:

H6: External ties affect the survival of mixed-mode groups.

**An Ecological and Evolutionary View of Organizational Impacts**

The open-systems perceptive, also called organization-environment perspective, articulates that when studying organizational outcomes, researchers need to be aware of the organization’s environments, and pay attention to the variation both in the organization and in the environment (Aldrich, 1971). As Aldrich (1971) advocates, organizations can be viewed as boundary-maintenance systems. Under this perspective, voluntary associations, due to a lack of dependence on other organizations as well as the
need to compete for members, operate in a relatively uncertain environment. Therefore, in order to survive, voluntary associations often face the challenge to vary enough internally to reflect the characteristics of the environment in organizational routines.

The two approaches commonly cited in studying the role of organizational environments are the population ecology model (Hannan & Freeman, 1977) and the resource dependence model (Pfeffer & Salancik, 1978), converging on the importance of environments in organizational decisions and structures, but diverging on the role of environmental selection (Aldrich & Pfeffer, 1976). The former emphasizes the processes of how organizations are differentially selected and determined by their fitness, measured by structural forms to their environments, while the latter focuses on active, managerial processes of selection enacted by organizations in adapting themselves to the environment (Aldrich & Pfeffer, 1976). In other words, selection and adaption are the two key mechanisms that can characterize these two approaches, respectively. The population ecology model addresses the population changes manifested in differential rates of births and deaths of structural forms, whereas the resource dependence model examines organizations’ internal dynamics and decision-making, that is, variations internal to the organization, in response to external forces (Aldrich & Pfeffer, 1976). Hence, these two approaches differ in the level of analysis: the population ecology model focuses on species of organizations and the resource dependence model is more concerned with individual organizations.

Under the resource dependence model, organizations are embedded in networks of relationships as they develop dependent relationships with external sources of resources. But organizations are able to strategically negotiate their interdependence in
the process of changing and responding to the environment, which represents the evolution of organizations, environments, and interorganizational relations over time (Pfeffer & Salancik, 1978, 2003). These sets of strategies enacted by organizations represent variations of interorganizational linkages, which can in turn affect organizational outcomes (Aldrich & Pfeffer, 1976). The emphasis on strategies is also central to the internal evolutionary view, or so-called intraorganizational ecological perspective, which delves into the evolution processes of internal dynamics manifested through the V-S-R mechanisms (e.g., Burgelman & Mittman, 1994). For example, in Katz’s (1984) study, Congress was seen to adjust to its external environment (e.g., increased bureaucratization, environmental regulation) through internal changes which helped it to control external forces after the energy crisis in the 1970s. Leaders of organizations (managers, owners) are expected to exercise their capacity to accelerate or delay the evolutionary V-S-R processes within the organization, with the aim of enhancing organizational survival (Lovas & Ghoshal, 2000; Meyer, 1994; Miner, 1994).

Regardless of which perspective is chosen, it is commonly understood that organizations are envisioned as evolving systems nested in other evolving systems, which thus take multiple levels of analysis (Aldrich, 1979; Miner, 1994). Organizations (including individuals within organizations) and populations all go through the V-S-R processes during their evolution (Aldrich & Ruef, 2006; Monge et al., 2011a). Nonetheless, little work has been done applying such multilevel views of ecology and evolution to examine the impacts of voluntary associations that span boundaries to interact with actors in their embedded environments. Moreover, the possibility of organization-environment coevolution, meaning interactions between organizations and
their environments and the subsequent consequences of these interactions for the environments, merits further examination (Baum & Singh, 1994b). To some extent, examining outcomes of voluntary associations and mixed-mode groups essentially echoes this coevolutionary approach because it is concerned with the impacts that groups exert on themselves and their environments as a result of a series of V-S-R processes taken within and outside the groups. Therefore, this study is expected to fill these gaps and make contributions by investigating the impacts of mixed-mode groups via a boundary spanning lens.

**Enactment of Strategies within and across Boundaries**

Boundaries of an organization can generally be defined in three ways: the extent to which interpersonal relationships become sparse, the limit of activities and control over them change, and the restriction regarding applicable criteria and rules identifying membership and inclusion changes (Baum & Rowley, 2002). Despite the diverse definitions, boundaries can be viewed as a way to define how a group needs to operate within its context in order to be effective (Sundstrom, de Meuse, & Futrell, 1990). Accordingly, boundary work refers to “the activities in which a system is engaged to deal with its environment, ranging from preserving resources in the face of competing demands to preventing environmental disruptions and collecting resources and support” (Yan & Louis, 1999, p. 29). So group boundary work entails not only outward-facing *boundary spanning and buffering*, activities that aim to import resources from the environment or deal with external disturbance, but also inward-facing *bringing up boundary*, activities meant to integrate obtained resources to apply to group tasks (Yan & Louis, 1999).
Research on team boundary spanning (Ancona, 1990; Ancona & Caldwell, 1988, 1992a) has great bearing on the ecological and evolutionary perspective because it examines how groups engage in communication activity involving external social actors in order to secure necessary resources for group operation and task completion. Under the view of team boundary-spanning, individual mixed-mode groups cannot avoid interacting with their environment, which consists of the physical community (e.g., local businesses and organizations) and other similar and dissimilar mixed-mode groups. Rooted in the resource dependence theory (Pfeffer & Salancik, 1978, 2003), boundary spanning research suggests that groups who can better manage their degree of dependence on their environments and related boundary spanning activities can perform better than those that focus only on internal dynamics (Ancona & Caldwell, 1988).

A set of strategies have been identified as representing the patterns of external activities groups perform, including ambassador activity (persuading others to support groups and lobbying for resources), task coordinator activity (coordinating and negotiating with outsiders for technical or design issues and obtaining feedback), scouting activity (general information gathering and mapping and scanning the environment), and guard activity (avoiding releasing information) (Ancona & Caldwell, 1992a).

After the pioneering work by Ancona and Caldwell in early 1990s, subsequent research dealing with the topic of team boundary spanning activities is mostly focused on the propositions of conceptual models (e.g., Choi, 2002; Drach-Zahavy & Somech, 2010; Joshi, 2006; Joshi, Pandey, & Han, 2009; Marrone, 2010). Yet available empirical
evidence has shown the benefits of investing in external activities in fostering group performance and effectiveness (e.g., Oh, Chung, & Labianca, 2004; Marrone, Tesluk, & Carson, 2007). Rather than simply measuring the frequency of communication with external actors, it is suggested that groups with a wider scope of strategies tend to experience long-term, positive impacts on internal process and performance (Ancona & Caldwell, 1992a). Evidence also indicates the positive influence of extrateam links in facilitating boundary spanning activities (scouting, ambassadorial), which in turn influences team effectiveness (Drach-Zahavy, 2011). Extrateam links are defined by Drach-Zahavy (2011) as the short-lived links between a group and one or more of the network contacts in its environment, such as experts, authorities, or customers.

Meanwhile, there is another stream of work focusing on different types of contingencies in boundary spanning activity and group outcomes. Choi (2002) posits that the relationship between group external activities and group effectiveness is moderated by a group’s task content, its environmental characteristics, and its external interdependence, which may fluctuate over time. For example, if a group relies on external actors for resources (high external interdependence), engaging in external activities will help achieve effectiveness; but if a group lacks such external interdependence, external activities will be unrelated to (or negatively related to) group effectiveness. Despite the lack of sufficient empirical evidence thus far, this pattern has been detected in the early work of Ancona. Findings from Ancona (1990) demonstrate that for groups in need of outside resources, support, or information, investing in external activities helps achieve better group performance than focusing on internal group processes such as cohesiveness. Faraj and Yan (2009) found the relationship between
boundary work and team performance was moderated by task uncertainty and resource scarcity; specifically, boundary spanning increases group performance when resources are abundant, but it hinders group performance when resources are scarce.

Nonetheless, the aforementioned benefits of boundary spanning activity should not downplay the equally important role of internal activity in influencing group outcomes. Despite the contingencies, such as temporal development of a group or environmental influences, maintaining a balance between internal and external activity is critical to group outcomes (Ancona & Caldwell, 1988; Choi, 2002; Sundstrom et al., 1990). Faraj and Yan’s (2009) study found that both boundary spanning and reinforcement were positively related to group performance. Similarly, Guinan, Cooprider, and Faraj (1998) arrived at similar findings, showing both external and internal group processes contributed to positive group performance. Managing team boundaries is also deemed an important leadership function, so that teams can maintain internal identity and accountability while allowing sufficient external communication channels (Morgeson, DeRue, & Karam, 2010). Druskat and Wheeler’s (2003) study indicates the most successful external team managers shifted their attention between internally and externally focused activities.

In sum, research on team boundary spanning has identified the positive relationship between external activity and group outcomes. But it must be noted that researchers have pointed out the possibly limited usefulness of contemporary organization theories to explain and understand voluntary associations (e.g., Knoke & Prensky, 1984). For example, boundaries of voluntary associations are often blurred and porous (Aldrich, 1971) and associations typically lack sufficient resource bases (e.g.,
personnel, leadership) and structural complexity to engage in externally reciprocated exchange relations and to obtain external information and support, which in turn can influence overall effectiveness (Knoke & Prensky, 1984). Therefore, it is both a theoretical and practical test to apply the existing research on organizational ecology and boundary spanning to examine the impacts of mixed-mode groups, a type of voluntary association. In light of the discussion mentioned above, particularly the studies that have identified the positive influence of internal and external strategies on group outcomes (Ancona & Caldwell, 1988, 1992a; Druskat & Wheeler, 2003; Faraj & Yan, 2009; Guinan et al., 1998), the following set of hypotheses examines the relationship between the strategies that mixed-mode groups use and their resulting outcomes.

H7a: The more strategies a mixed-mode group uses involving internal group processes, the more likely a group will perceive the impacts of collective activity.

H7b: The more strategies a mixed-mode group uses involving external actors, the more likely a group will perceive the impacts of collective activity.

Networks and Resources

According to resource dependence theory and boundary spanning, resource acquisition is the central mechanism that drives boundary spanning activity and external networking. In conceptualizing external team interactions, two approaches have been adopted: a qualitative or descriptive approach and a network analytical approach (Joshi et al., 2009). The former provides insights into the processes of how groups initiate strategies to enhance external visibility, secure information, and coordinate with others outside the group (e.g., Ancona, 1990) while the latter draws on social capital theory to investigate how groups invest in external relationships that create values and result in
resources (e.g., Oh et al., 2004). Social capital refers to the resources embedded within and available through social relations which are accessed and/or mobilized by actors in purposive actions (Coleman, 1988; Lin, 1999; Nahapiet & Ghoshal, 1998). Another similar concept, which is often examined in the interorganizational context, is social embeddedness. Research on social embeddedness is primarily concerned with how micro-social factors, such as an employee’s social networks, influence the performance of a firm (Granovetter, 1985).

Incorporating the notions of social capital and social embeddedness in the ecological and evolutionary framework can help shed light on how organizations and groups secure resources and maintain existence by tapping into their social networks. For example, Westphal, Boivie, and Chng’s (2006) study exemplifies that social embeddedness in the form of friendship ties maintained among corporate leaders provide advantages for organizations to manage resource dependence. Other empirical studies on work groups show that groups that more frequently secure resources with different people outside those groups tend to attain better outcomes, such as getting higher performance ratings, producing more innovations, and having more efficient project completion (e.g., Hansen, 1999; Keller, 2001; Tsai, 2001). Oh et al.’s (2004) findings indicate that groups can attain maximum effectiveness by investing in intragroup closure relationships and expansive intergroup relational structures, through which resources can be accessed. Nonetheless, extant research is mostly developed and tested on work groups; less is known about whether these arguments of network resources can apply to voluntary associations and mixed-mode groups. Hence, a second set of hypotheses is proposed to
investigate the possibility of engaging in external communication to obtain resources for mixed-mode groups.

H8a: The more a mixed-mode group engages in external communication with network contacts, the more likely a group will receive resources necessary for group operation.

H8b: The more a mixed-mode group receives resources necessary for group operation, the more likely a group will perceive the impacts of collective activity.

While there has been extensive discussion on the advantages of resource networks in facilitating positive organizational outcomes, the ecological and evolutionary perspective emphasizes the strategic choices enacted on by organizations as they explore the networking environment and decide whom to connect with (Aldrich & Pfeffer, 1978; Monge et al., 2008). In this vein, it can be argued that initiating and maintaining communication links is incorporated as part of organizations’ strategic action. At first glance, it might seem reasonable that only when enacting external strategies will a mixed-mode group feel the need to engage in external communication. Research has shown that organizations achieving high performance often have a wide range of external strategies on hand, for example, initiating multiple, simultaneous ties with potential outside partners (Ozcan & Eisenhardt, 2009). Yet it is also plausible that even if a group focuses on internal strategies, they may acquire resources through external communication. For instance, a group might research other groups’ situations when implementing a group policy or deciding a good activity format. Moreover, informed by the interview data with Meetup organizers, it is suggested that to a large degree, internal strategies may reflect the informational contributions from people outside the group. Hence, another two
hypotheses are proposed to examine the relationships between both scopes of strategies and the resources received through external communication.

H9a: More frequent external communication helps a mixed-mode group to acquire resources when implementing internal strategies.

H9b: More frequent external communication helps a mixed-mode group to acquire resources when implementing external strategies.

The review thus far has revealed a common observation that a group is capable of enacting external and internal strategies, building on the networking benefits they it has accumulated, which in turn helps achieve group outcomes. A well-researched line of work has identified the advantages of both internal and external network links in facilitating group outcomes (e.g., Oh et al., 2004; Reagans, Zuckerman, & McEvily, 2004). In a similar vein, strategies directed toward members inside the group and non-members outside of groups both contribute to group outcomes (Ancona & Caldwell, 1988; Faraj & Yan, 2009; Guinan et al., 1998). Yet, there is a limited understanding of whether, and how, network communication and resource acquisition enhance the effects of internal and external strategies on group outcomes differently. Ancona’s (1990) study indeed points out the accentuated effects of boundary spanning on group performance occurring in groups in need of outside resources, support, or information. It is thus a possible conjecture that receiving resources from external contacts enhances group efforts invested in external strategies, more than in internal strategies, when it comes to producing outcomes. For example, Ancona and Caldwell’s (1992b) and Keller’s (2001) studies showed that the frequency of external communication mediated the influence of functional diversity, an antecedent of boundary spanning, on group performance.
Similarly, external knowledge sharing was found to be more strongly associated with group performance when groups were more structurally diverse (member differences in geographic locations, functional assignments, reporting managers, and business units), which may be a precondition for boundary spanning (Cummings, 2004). It is thus hypothesized that mixed-mode groups’ use of certain types of strategies will exhibit different effects on group outcomes through network communication and resource acquisition.

H10: Compared with internal strategies, implementing external strategies is more likely to facilitate group impacts when groups engage in more frequent network communication and acquire resources.

**Mixed-Mode Organizing**

An important characteristic of mixed-mode groups is technological affordances of mixed-mode organizing across mediated and face-to-face modes. While research on voluntary associations has sought a well-suited theoretical lens over the past few decades, advances in ICTs have introduced more opportunities and challenges as individuals are afforded the option to create and participate in collective activities with like-minded people (Smith, 2000). The Internet in particular has been perceived as an important contributor to the impacts of voluntary associations in contemporary society. Pew’s report demonstrates this pattern: 59% of all American adults reported that the Internet has played a role in their participating voluntary group’s ability to organize activities and 51% believed their groups have the ability to recruit new members because of the Internet (Rainie et al., 2011).
The notion of mixed-mode relationships (MMR) has been proposed to describe the situation in which people meet online and migrate their relationships offline (Walther & Parks, 2002). Yet as mixed-mode communication and relationships become increasingly prevalent, new theoretical thinking and empirical evidence are needed to provide insights into the way the Internet plays into individuals’ everyday communication ecologies (Walther & Parks, 2002; Walther, 2010). Modality switching has been thus far researched in interpersonal contexts (e.g., Gibbs, Ellison, & Heino, 2006; Lederbetter, 2010; Ramirez & Zhang, 2007). In the group context, extant research has undoubtedly produced a rich set of findings illuminating how technology-mediated groups accomplish task completion and manage relationships, but the extent to which these findings can be generalized to other contexts remains questionable. This speaks to the two major areas of research that have delved into this topic: research on virtual teams and virtual (online) communities.

Identifying the effects of modes of communication is an ongoing topic in virtual teams research. A common observation resulting from this work is that groups can perform well if their computer-mediated communication is interspersed with face-to-face interaction, either occasionally or regularly (e.g., Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002; Kennedy, Vozdolska, & McComb, 2010; Maznevski & Chudoba, 2000; Ocker, Fjermestad, Hiltz, & Johnson, 1998). Similar findings are also documented in another set of research that holds a broader definition of the online community (or groups), that is, groups with diverse objectives, including those politically motivated or task-oriented ones. This stream of work often comes to the conclusion that face-to-face interaction is helpful to engage members in online group activities (e.g., Alon et al.,
Specifically, 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 stopping their contributions to the community.

It is true that these numerous research efforts have identified the benefits of mixed-mode communication in various aspects of group coordination or even group outcomes; yet most research tends to be situated in either well-defined task settings or in online communities dominated by computer-mediated communication (CMC) activity, leaving much ambiguity about the applicability of these findings to other contexts, such as Internet-established voluntary associations. Moreover, very little is known about how multiple modalities are patterned in different aspects of group organizing; or, how groups capitalize on mixed modalities to organize group activities and result in desired outcomes. This direction has been hinted at previous research, but has not yet been expanded further. Klein’s (1999) case study of Telecommunication Policy Roundtable-Northeast (TPR-NE) demonstrates the usefulness of online forums in facilitating citizen associations, which can become more responsive and robust, and thus be able to unite more members. In Kollock’s (1999) discussion of online mobilization in a campaign called “NetDay,” the campaign website, by supplementing face-to-face meetings taking place among the participants (e.g., school officials, organizers, volunteers), helped create an efficient federated system matching the multiple needs of volunteers, organizers, and sponsors. In another networked community setting, Kavanaugh, Carroll, Rosson, Zin, and Reese’s (2005) study demonstrates increased multimodal communication by local
social groups over time, and member involvement in these groups was also enhanced as a result of both increased face-to-face and online interaction.

While it is not uncommon to see how the Internet has become utilized as a set of popular tools for contemporary campaigns and community projects, there is a lack of conceptual and theoretical reasoning linking these technological applications to a broader context of associational activities. Under the ecological and evolutionary perspective, it is presumed that multimodality is a critical determinant of group organizing. It is argued that all of the mixed-mode groups use a mix of face-to-face and computer-mediated communication, but they may exhibit varying levels of electronic dependence, which may in turn influence group outcomes (Gibson & Gibbs, 2006). In light of this, a general research question is posed:

RQ5: How is the degree of mixed modality incorporated in organizing and producing the impacts of mixed-mode groups?
Figure 2-1. An overview of the research objective, the focus of investigation and the corresponding research questions.

- **RQ1 & RQ2**: Ecology and Evolution of Mixed-Mode Groups: Formation and Continuity of Groups
  - How are the V-S-R processes reflected in the formation and continuity of mixed-mode groups?
  - What are the V-S-R processes in the evolution of mixed-mode groups at (a) the group and (b) the population level?
- **RQ4**: Ecology and Evolution of Mixed-Mode Groups at Group and Population Levels
  - Hypotheses regarding ecological and demographic factors influencing the survival of groups: H1-H6
- **RQ3**: Outcomes of Sustained Mixed-Mode Groups
  - What are the forms and outcomes of collective action by sustained mixed-mode groups?
  - Hypotheses regarding groups’ strategic actions and group impacts: H7-H10
- **RQ5**: Influence of Technological Affordances of Mixed-Mode Organizing on Group Evolution
  - How is the degree of mixed modality incorporated in organizing and producing the impacts of mixed-mode groups?
Chapter 3
Methodology

The research site of this study was Meetup.com, a website designed to facilitate the creation of groups and coordination of offline group meetings among participants based on shared interest and physical location, that is, the formation and organizing of mixed-mode groups. Meetup.com fits the needs of this study not only because it is the largest network of mixed-mode groups in the world (over 9 million users and 90,000 local groups, which span 45,000 cities across the globe) but also because it contains a complete history of group activities, whereas similar services such as Craigslist and Facebook do not. Given the exploratory and complex nature of the research topic and the use of an ecological and evolutionary perspective guiding the inquiries throughout the study, a sequential and mixed methods approach to data collection and analysis was implemented (Creswell, 2009). The procedures consist of inductive interviews with 34 Meetup group organizers, a longitudinal analysis of 100 random Meetup groups over 18 months of observation, and an online survey with 171 Meetup group organizers (see Figure 3-1).

Data Collection and Analysis: Interviews

Among the 34 participating organizers interviewed, 14 group organizers were selected from 100 randomly sampled groups, which were provided by the research unit of Meetup.com. All of the organizers of these 100 groups were contacted through the contact functionality of Meetup.com, but only 14 organizers followed through and participated in the interview. In addition to the random sample, interviews were
Figure 3-1. A sequential mixed methods approach of data collection and analysis.

- **Qualitative Interviews**
  - Semi-structured interview with 34 Meetup organizers
  - 31 interviews via phone and FtF, 3 through email
  - 14 participants were selected through random sampling and 20 through purposive sampling
  - Duration: July 2009-January 2010, with 10 organizers followed up through July 2011
  - Data analysis: Grounded approach

- **Archived Group Data**
  - Longitudinal analysis of 100 randomly selected Meetup groups
  - Tracking period: August 1, 2009-February 1, 2011 (18 months)
  - Data analysis: Content analysis and survival analysis

- **Online Survey**
  - Survey with 171 Meetup organizers selected from stratified and randomly sampled groups
  - Duration: December 4, 2010-February 1, 2011
  - Data analysis: Partial least squares (PLS)
conducted with another 20 group organizers who were selected through purposive sampling. Given that the objective of the study was to delve into both a systematically informed picture of the population of Meetup groups and also the reasons behind sustained groups, purposive sampling was implemented to locate 40 relatively active groups for interview and analysis. These groups were selected with the consideration of various group characteristics, including geographic regions (e.g., East Coast, Midwest, South, West Coast), group topics (e.g., social, adventure/activity, task-focused), organizing structures (e.g., single organizer, with assistant organizers) and group status (e.g., frequency of meetings). In this purposive sample, among the 40 organizers being contacted, 20 organizers agreed to participate in the interview. Among the total 34 organizers, twenty-one (61.8%) were men and thirteen (38.2%) were women.

Interviews were semi-structured and conducted mainly over the phone, ranging from 14 to 114 minutes ($M = 39.67, SD = 22.04, n = 30$) (see Appendix A for the interview protocol). Three other interviews were completed via email upon the participants’ request, and one face-to-face interview was performed without the use of the recording device due to ambient interruptions. The first-time interviews took place from July 2009 to January 2010, but 10 organizers were followed through July 2011 after observing conspicuous group development (e.g., group closure, spin-off groups). By August 2011, seven out of the 34 groups under study were closed (mean of age = 46.53 months, $SD = 28.69$; see Table 3-1 for more details).

**Procedures of Analysis**

All of the 30 audio-recorded interviews were transcribed. The transcripts, including the four interviews that were not audio-recorded, were entered in ATLAS ti and
Table 3-1

Details about Participating Organizers and Their Groups on Meetup.com

<table>
<thead>
<tr>
<th>Group Pseudonyms</th>
<th>Group Topic(s)</th>
<th>Geographic Location (state)</th>
<th>Group Duration in Months (as of August 1, 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVHikingGroup</td>
<td>Sports and recreation</td>
<td>Nevada</td>
<td>67</td>
</tr>
<tr>
<td>DCCulturalGroup</td>
<td>Cultures and languages</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>TXSpiritualGroup 1</td>
<td>Health and support</td>
<td>Washington, DC, Texas</td>
<td>22 (closed)</td>
</tr>
<tr>
<td>TXSpiritualGroup 2a</td>
<td>Health and support</td>
<td>Texas</td>
<td>9 (closed)</td>
</tr>
<tr>
<td>NMChannelingGroup</td>
<td>Health and support</td>
<td>New Mexico</td>
<td>9 (closed)</td>
</tr>
<tr>
<td>CAESLGroup (assistant organizer)b</td>
<td>Cultures and languages</td>
<td>California</td>
<td>103</td>
</tr>
<tr>
<td>CAESLGroup (organizer)b</td>
<td>Cultures and languages</td>
<td>California</td>
<td>103</td>
</tr>
<tr>
<td>OHNITGroup (current organizer)</td>
<td>Social</td>
<td>Ohio</td>
<td>104</td>
</tr>
<tr>
<td>OHNITGroup (former organizer)</td>
<td>Social</td>
<td>Ohio</td>
<td>104</td>
</tr>
<tr>
<td>NJ/NYRLGroup</td>
<td>Religion and beliefs</td>
<td>New Jersey</td>
<td>105</td>
</tr>
<tr>
<td>NYVGGroup</td>
<td>Communities and lifestyles</td>
<td>New York</td>
<td>105</td>
</tr>
<tr>
<td>MNBSGroupb</td>
<td>Business and career</td>
<td>Minnesota</td>
<td>24</td>
</tr>
<tr>
<td>DCJassGroup</td>
<td>Art and entertainment</td>
<td>Washington, DC</td>
<td>56</td>
</tr>
<tr>
<td>SFGameGroupb</td>
<td>Hobbies</td>
<td>California</td>
<td>28</td>
</tr>
<tr>
<td>WISocialGroup</td>
<td>Social</td>
<td>Wisconsin</td>
<td>31</td>
</tr>
<tr>
<td>NYAdventureGroup</td>
<td>Sports and recreation</td>
<td>New York</td>
<td>25</td>
</tr>
<tr>
<td>COSportsGroup</td>
<td>Hobbies</td>
<td>Colorado</td>
<td>38 (closed)</td>
</tr>
<tr>
<td>WIDogGroup</td>
<td>Pets and animals</td>
<td>Wisconsin</td>
<td>29</td>
</tr>
<tr>
<td>NJVegGroup</td>
<td>Communities and lifestyles</td>
<td>New Jersey</td>
<td>51</td>
</tr>
<tr>
<td>TXHikesGroup</td>
<td>Art and entertainment</td>
<td>Texas</td>
<td>36</td>
</tr>
<tr>
<td>TXRLGroup</td>
<td>Religion and beliefs</td>
<td>Texas</td>
<td>40</td>
</tr>
<tr>
<td>NCNASCARGroup</td>
<td>Hobbies</td>
<td>North Carolina</td>
<td>37 (closed)</td>
</tr>
<tr>
<td></td>
<td>Group Name</td>
<td>Topic</td>
<td>Location</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------</td>
<td>---------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>21</td>
<td>ORWSocialGroup</td>
<td>Social</td>
<td>Oregon</td>
</tr>
<tr>
<td>22</td>
<td>NJPRGroup</td>
<td>Business and career</td>
<td>New Jersey</td>
</tr>
<tr>
<td>23</td>
<td>SFNGroup</td>
<td>Science</td>
<td>California</td>
</tr>
<tr>
<td>24</td>
<td>MIADGroup</td>
<td>Sports and recreation</td>
<td>Michigan</td>
</tr>
<tr>
<td>25</td>
<td>NJ/NYGreenGroup</td>
<td>Communities and lifestyles</td>
<td>New York</td>
</tr>
<tr>
<td>26</td>
<td>OHIThinkGroup</td>
<td>Religion and beliefs</td>
<td>Ohio</td>
</tr>
<tr>
<td>27</td>
<td>MIWalkGroup</td>
<td>Sports and recreation</td>
<td>Michigan</td>
</tr>
<tr>
<td>28</td>
<td>PAThinkGroup</td>
<td>Education &amp; Religion and beliefs</td>
<td>Pennsylvania</td>
</tr>
<tr>
<td>29</td>
<td>OHSocialGroup\textsuperscript{b}</td>
<td>Communities lifestyles &amp; Social</td>
<td>Ohio</td>
</tr>
<tr>
<td>30</td>
<td>COTechGroup</td>
<td>Internet and technology</td>
<td>Colorado</td>
</tr>
<tr>
<td>31</td>
<td>CAGameGroup</td>
<td>Hobbies</td>
<td>Canada</td>
</tr>
<tr>
<td>32</td>
<td>MDThinkGroup\textsuperscript{1}</td>
<td>Education &amp; Religion and beliefs</td>
<td>Maryland</td>
</tr>
<tr>
<td>33</td>
<td>MDThinkGroup\textsuperscript{2}</td>
<td>Education &amp; Religion and beliefs</td>
<td>Maryland</td>
</tr>
<tr>
<td>34</td>
<td>MAClimbGroup</td>
<td>Sports and recreation</td>
<td>Massachusetts</td>
</tr>
</tbody>
</table>

\textit{Note.} Group 5 and Group 22 closed down in April 2010 and both were for-profit groups; Group 15 and Group 20 closed down in December 2010 and January 2011, and both were sports game watching groups.

\textsuperscript{a}These groups were generated from the random sample, but were on the verge of being closing down when selected. The organizers of these groups had multiple groups serving as organizers; thus when approached for interview, they were willing to provide account of both their retired group and their other ongoing groups. \textsuperscript{b}The organizers (or the assistant organizer) being interviewed had stepped down at the time of paper writing.

analyzed through a series of coding processes: open coding, axial coding and integration (Strauss & Corbin, 1990). First, open coding, which looks for emergent themes, was implemented to go over all the transcripts the first time and detect the emerging themes.

Second, axial coding, which links emergent themes to larger categories, was performed to organize these themes into bigger categories and apply these categories to make the first attempt of coding three transcripts. Subcategories were generated while original categories were modified, and new categories were added during this first attempt of
coding. Then the newly modified coding scheme was used to recode the original three manuscripts (for complete coding categories, see Appendix B). Lastly, the coding scheme was applied to the rest of the 31 transcripts and iterative comparative analysis was performed on quotations, linking them to the central categories sought for this research. Note that because interviews were conducted mostly following the order and structure of the questions as listed in the protocol, the decisions of where to code and which codes to apply were relatively straightforward, and so were the comparisons of interviewees’ responses under different categories.

Research questions (RQ1-4a) were answered through the query tool provided by the ATLAS ti computer program, which searched the entire corpus for the sentences and paragraphs of quotes that had been coded with the established categories (in Appendix B). Specific query criteria to measure the two major sets of variables (contexts, collective action) were applied as follows.

**Operationalizations of contexts.** To answer the first two research questions about the ecology of groups in the form of social, physical and temporal contexts that influence group evolution, a series of codes were used (see Appendix B). Social contexts were assessed using *the prior history of the group* (1.1), *the locale* (3), and *recruitment and advertisement* (4) codes. In relation to the social context that occurs during group development, following codes were used: *internal group activity* (11.1), *compositions of attendees* (11.1.1), *interaction with the local community* (11.1.2), *external group activity* (11.2), *group-related communication* (6.1.1), *outside group communication* (6.1.2), *external communication* (6.2), *incoming flow of communication* (6.2.1), *outgoing flow of communication* (6.2.2) and *two-way flow of communication* (6.2.3). Logistic
arrangement (8) and the locale (3) codes were used to identify the physical contexts where group activities take place. To examine the temporal contexts of groups, group development (5) and group transition (1.4) were used.

**Operationalizations of collective action.** The codes used to measure group collective action included those placed under group activity (11.0-11.2) and locale (3). It was hypothesized that the connections that a group has at both individual and collective levels would be influenced by or influence the forms of group activity. To assess the influence of these structural and communicative characteristics in relation to group activity, affiliation ties (12.2), direct ties at group levels (12.2.1), indirect ties at group levels (12.2.2), embeddedness at individual levels (9.1) and embeddedness at collective levels (9.2) were used to answer the third research question.

**Data Collection and Analysis: Archived Group Data**

A random sample of 100 Meetup groups was retrieved with the assistance of the research unit of Meetup.com and was observed over an 18-month follow-up period from August 1, 2009 to February 1, 2011. On the webpage of each Meetup group, basic information about the group is listed, including group description, group topics, time of creation, membership size, organizer and/or assistant organizers, number and details of group events (e.g., content of activities, locations, cooperating groups or organizations). During these 18 months, observations were made on every 1st and 15th of the month because Meetup.com displays a warning closure notice on the group page approximately 15 days before a group closes down. As such, the timing of group closure can be more accurately detected and recorded. Moreover, the reason of using the month as the interval was based on the structure of the subscription schemes of Meetup.com, which
charges the group organizer dues on a monthly basis despite the differences in the length of the subscription plans. Figure 3-2 presents the geographic distribution of these 100 groups; Tables 3-2 and 3-3 display the descriptive analysis of these groups. Related to RQ4b and six hypotheses (H1-H6), operationalizations of the key variables are detailed as follows.

*Figure 3-2. Geographic distribution of 100 random Meetup groups observed (by state).*

The category of “others” encompass three groups from Japan, Australia and Switzerland.
Table 3-2

**Distribution of Group Topics among the 100 Meetup Groups**

<table>
<thead>
<tr>
<th>Topic</th>
<th># of groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and career</td>
<td>19</td>
</tr>
<tr>
<td>Parenting and family</td>
<td>14</td>
</tr>
<tr>
<td>Religious and beliefs</td>
<td>12</td>
</tr>
<tr>
<td>Sports and recreation</td>
<td>11</td>
</tr>
<tr>
<td>Social</td>
<td>10</td>
</tr>
<tr>
<td>Art and entertainment</td>
<td>9</td>
</tr>
<tr>
<td>Hobbies</td>
<td>7</td>
</tr>
<tr>
<td>Health and support</td>
<td>6</td>
</tr>
<tr>
<td>Internet and technology</td>
<td>5</td>
</tr>
<tr>
<td>Culture and language</td>
<td>4</td>
</tr>
<tr>
<td>Politics and activism</td>
<td>2</td>
</tr>
<tr>
<td>Science</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 3-3

**Descriptive Analysis of the 100 Meetup Groups**

<table>
<thead>
<tr>
<th></th>
<th>Group Age</th>
<th>Membership Size</th>
<th># of Meetings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>256.01</td>
<td>101.76</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>673.96</td>
<td>176.06</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>99</td>
<td>897</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Mean</td>
<td>29.01</td>
<td>22.14</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>673.96</td>
<td>176.06</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>99</td>
<td>897</td>
</tr>
<tr>
<td><strong>Ongoing Groups</strong></td>
<td>Mean</td>
<td>432.04</td>
<td>171.46</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>878.38</td>
<td>215.99</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>6039</td>
<td>897</td>
</tr>
<tr>
<td><strong>Closed Groups</strong></td>
<td>Mean</td>
<td>49.37</td>
<td>19.93</td>
</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>98.67</td>
<td>23.96</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>580</td>
<td>106</td>
</tr>
</tbody>
</table>

*Note.* N=100 in the total sample, N= 54 in ongoing groups and N= 46 in closed groups.

Membership size and the number of meetings were based on the data as of February 1, 2011.
Operationalizations of key variables. *Group niche* was measured by member requirements. Referencing Baum and Singh’s (1994c) definition of organizational niche based on the ages of children day care centers are licensed to enroll, member requirements were used to measure the niche of a *Meetup* group. A group was coded 2 if it entailed specific member requirements in terms of demographic aspects (e.g., gender, age, marital status, ethnicity and race, language), professional orientation (e.g., occupation, professional status) and others (e.g., social role), and coded 1 if no requirements were inferred. Efforts were made to go over the group description and group events to decide the *profit orientation* of a group. If it was mentioned that the group aims to sell the products associated with the organizer’s own business (e.g., dancing class, coaching services, PR training services), then this group was coded as for-profit (code = 2). Otherwise, it was coded as not-for-profit (code = 1).

*Leadership change* was examined based on the bio page of the group organizer. If the time he/she was listed as the organizer was different from the time the group was created, then this group was coded as experiencing leadership change (code = 2). Otherwise, a group was coded as without leadership change (code = 1). *Leadership team* was measured by going over the information listed under the organizer section of each *Meetup* group. If there was only the organizer listed, then this group was coded as without a leadership team (code = 1). If there were a number of organizers, assistant organizers and/or event organizers listed, then it was coded as having a leadership team (code = 2).

*External ties* were investigated based on the content analysis of each group event. In the event section, if a group has ever mentioned contacts outside of the group, such as
other Meetup or non-Meetup groups as part of the group event, other organizations listed as the sponsor or the recipient of the event, or guest speakers invited from outside for group event, then this group was coded as with external ties (code = 2). Otherwise, it was coded as without external ties (code = 1). Note the ties tackled here are not merely structural links; they refer to the communicative links that have been specifically and explicitly mentioned and incorporated as part of the group event. Two coders coded the data individually using the coding schemes mentioned above and a high degree of inter-rater reliability was attained for coding these five variables, with Cohen’s Kappa ranging from 0.85 to 0.97. Lastly, population density was obtained by recording the number of Meetup groups within a radius of 25 miles (Density I) and 10 miles (Density II) using the search function on Meetup.com. These two variables were analyzed after being log-normalized to better approximate a normal distribution.

Geographic location in the forms of urban proximity, population density and population change has been found to be linked to growth and survival of voluntary associations (e.g., McPherson, 1988; Smith, 1997; Wollebæk, 2009). Hence, local population size and residential mobility were included as the control variables. Using the location that a Meetup group listed (e.g., Boston, MA), relevant information about local population size and residential mobility was retrieved from U.S. Census Bureau’s online database (i.e., 2009 estimate and 2005-2009 community survey).³

To test the hypotheses, survival analysis (or event history analysis) was used.³ By taking into account temporal factors, survival analysis is useful in simultaneously examining whether and when a target event occurs (e.g., deaths of organizations, success of rehabilitation, or survival of groups) (Singer & Willett, 1991). This analytical
technique also lends itself to comparative inferences across cases by taking observations of the units over time (Box-Steffensmeier & Jones, 2004).

Two assumptions related to survival analysis were tested. First, squared multiple correlations (SMC) was conducted to check for evidence of multicollinearity. No SMC exceeded the recommended threshold of .90 (Tabachnick & Fidell, 2001); thus it was concluded that the variables under study were nonredundant. The assumption of proportional hazards required in the Cox regression model was also tested by adding to the model interaction of time with all the variables, and then assessing the effect of these interactions (Tabachnick & Fidell, 2001). None of the covariates significantly interacted with time. Hence, it was considered that the assumption of proportionality was not violated.

Data Collection and Analysis: Online Survey

Considering the importance of age in group survival as observed in the earlier stage of data analysis, a stratified random sampling strategy was used to generate 2,000 Meetup groups for the recruitment for the online survey. First, the entire population of Meetup groups (mainly in North America) was sorted into three sub-populations based on age (less than one year, 1-2 years, more than two years). Then, 2,000 groups were 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 to two years), and 26.87% (537 groups) aged more than two years. In situations where the same organizers managed multiple groups, only one of the groups was randomly selected for invitation. Moreover, some groups listed in the sampling frame closed down by the time the invitation was performed. At the end, among the 2000 sampled groups, 1,237
were considered as valid subjects for invitation. Those 1,237 selected organizers were contacted individually through the contact function available on Meetup.com for the request to participate in the online survey, and 171 responded (response rate = 13.82%). Data collection lasted approximately two months, from December 4, 2010 to February 1, 2011. Email or web surveys typically have lower response rates because the technical features make the decision easier to delete or not to respond to a survey request compared to other survey methods such as in-person or phone surveys (Dillman, 2000). Moreover, due to the general high concern for privacy characterizing Meetup users, each organizer was contacted only once and no reminder emails were generated.\(^5\) Admittedly, lack of follow-up contacts may have also contributed to the low response rate (Sheehan, 2001).

Nonetheless, nonresponse bias may arise due to low response rates and the differences in the estimates between respondents and nonrespondents (Bose, 2001). In order to identify the potential sources of bias, nonresponse bias analyses were conducted. First, an evaluation of the bias was performed by comparing the true values of the population parameters with the values derived from the survey. Compared to the population of Meetup.com, the survey sample was somewhat skewed toward groups which were older and having larger membership size.\(^6\) There was, however, no substantial difference in terms of the meeting frequency. Second, comparisons were made between early and late responders, as later respondents may resemble nonrespondents more than earlier respondents (Bose, 2001). Hence, t-tests were conducted on the earlier and latest third of respondents for each of the variables. The results suggest no significant differences between these two groups of respondents on any
of the variables (see Table 3-4); hence, the sample can be assumed to be relatively free of nonresponse bias.

Table 3-4

Results of Comparing Means between the Earliest and Latest Respondents

<table>
<thead>
<tr>
<th></th>
<th>Respondents</th>
<th>Mean</th>
<th>S.D.</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>27.96</td>
<td>19.259</td>
<td>-.421, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>29.75</td>
<td>25.686</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>219.21</td>
<td>274.209</td>
<td>-.838, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>269.55</td>
<td>361.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting Frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>3.41</td>
<td>3.519</td>
<td>-.043, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>3.44</td>
<td>5.057</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>6.26</td>
<td>1.530</td>
<td>.884, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>5.96</td>
<td>2.061</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>4.07</td>
<td>2.251</td>
<td>1.332, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>3.51</td>
<td>2.178</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1.961</td>
<td>.685</td>
<td>1.662, p&gt;.05</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>1.764</td>
<td>.576</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.022</td>
<td>.962</td>
<td>.647, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>1.918</td>
<td>.736</td>
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<td></td>
</tr>
<tr>
<td>I</td>
<td>4.205</td>
<td>.713</td>
<td>.674, p&gt;.10</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>4.102</td>
<td>.908</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. I refers to the earliest third of respondents (n = 57) and II the latest third of respondents (n = 57).

About the Meetup Groups Studied

The age distribution of participating groups was slightly different from the Meetup population. The groups participating in the survey were concentrated in older groups: groups aged less than 12 months accounted for 29.76% of the groups under study,
12-24 months 30.36% and those older than 24 months were about 39.88%. In other words, the groups aged less than one year were under-represented while those over two years were over-represented (the proportion of these three subpopulations is 48.4%, 24.73%, and 26.87%). In terms of geographic distribution, as Figure 3-3 shows, participating groups were concentrated in several populous states, including California, New York, Florida and Texas. Moreover, among the 171 groups, about one third (31.8%, n = 54) of the groups had experienced leadership change because the originator of the group was not running the group any more.

Figure 3-3. Geographic distribution of 171 responding Meetup groups (by state).

Instruments and Measures

Due to the exploratory nature of the study, instruments of the eight variables were largely informed by the interviews conducted at the earlier stage with 34 Meetup group organizers. The interviews were first audio recorded and transcribed; the transcripts
were then culled and analyzed, noting where the organizers described how they manage to keep the group going. Despite lacking well-established validity, the advantage of this procedure is that it revealed and examined strategies that are relevant and natural for the Meetup groups under study. The survey was pilot tested with five Meetup organizers to validate original scales and clarify question wording. Multi-indicator scales were evaluated based on reliability and validity, which will be reported in the results mentioned in Chapter 6 (see Tables 6-1, 6-2, 6-3).

**Scope of strategies used.** To examine the patterns of internal and external activities that a group engages in, the scope of strategies is deemed an apt measure. The scope of strategies was examined through two categories: *internal* and *external strategies*. Respondents were asked to indicate whether and how often they have used a given strategy to run their group on a 5-point scale, where 1= *Never*, 2= *Once*, 3= *A few times*, 4= *Many times*, 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 interviews (see Appendix C for the individual items). 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 range 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 communication.** Directionality was considered when measuring a group’s communication with its network contacts. To measure incoming communication, respondents were asked to indicate how often other Meetup groups and other non-Meetup
groups/organizations have contacted them over the course of their group development on 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 communication with five different network 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. Aggregately, the latent variable of network communication (α = .806, M = 1.907, SD = 0.653) was comprised of these six items to measure the frequency of a group’s overall communication with its network contacts.8

Resource acquisition. Inspired by the group boundary spanning literature that measures social capital by examining network internal density and external range as well as their impacts on group performance (e.g., Reagans et al., 2004), resource acquisition was investigated through 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 on 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). Aggregately, the latent variable of density of resources received (α = .796, M = 1.722, SD = 0.624) was comprised of six items measuring the frequency of a group’s receipt of resources from its network contacts.9 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 \( (M = 2.021, SD = 0.899) \). Resource acquisition was the variable used in the testing of the complete model.

**Group impacts.** Informed by Meetup organizers’ responses during the interviews, impacts of a group’s collective activity were measured using six items, covering the aspects of interpersonal relationships, community development and local interaction. These dimensions coincide 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* (sample item: My group has contributed to building and/or maintaining relationships among members) \((\alpha = .874, M = 4.132, SD = 0.756)\).

**Control variables.** Three additional variables were included as controls: group age, group size and meeting frequency. It has been argued that impacts of voluntary associations will mostly be observable after one or two years of 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 stands
to reason that group size and frequency of face-to-face interaction are also key to generating the impacts of voluntary associations: a group with enough members frequently showing up for activities would be likely to experience significant impacts (Smith, 1999).

Respondents were asked to provide their groups’ date of establishment (month, year) on Meetup.com, based on which the group ages for all 171 groups were calculated to the cutoff date of February 1, 2011. Group size was based on respondents’ self-reported number of members their group had at the time the survey was filled out. Respondents were also asked to identify how often their group met in the last month (number of times) in order to assess a group’s meeting frequency.

**Analytical Procedures: Partial Least Squares (PLS) Path Modeling**

In testing the hypotheses (H7-H10), four main variables, along with three control variables, were entered in the model to predict group impacts as the ultimate endogenous variable (see Figure 3-4). PLS path modeling was chosen for data analysis based on the following reasons: 1) the exploratory nature of the study and the intention to test and validate the hypothesized relationships that have not been previously investigated; 2) small to moderate sample size; 3) violations of the assumption of multivariate normality. Like covariance-based structural equation modeling (SEM) (e.g., LISREL, AMOS), variance-based PLS simultaneously assesses both the structural component, representing the relationships between the latent variables, and the measurement component, representing the relationships between the latent variables and their indicators (Fornell & Bookstein, 1982). Yet, unlike covariance-based SEM focusing on theory testing and confirmation, the statistical objective of soft modeling techniques (PLS) is to maximize
the explained variance of the dependent variables \( R^2 \) (Hair, Ringle, & Sarstedt, 2011). In other words, the emphasis of PLS is to examine the significance of the relationships and the resulting \( R^2 \), which renders it a suitable approach to predictive and theory-building applications (Gefen, Straub, & Boudreau, 2000). Moreover, compared to the stringent assumptions required for covariance-based SEM, PLS is considered to be able to offer robust approximations even when sample sizes are small and when distributions are highly skewed (Bagozzi, 1994; Chin & Newsted, 1999; see reviews of PLS modeling by Henseler, Ringle, & Sinkovics, 2009 and Sosik, Kahai, & Piovoso, 2009).

Given the early stage of theory development associated with the research goal of this study, PLS is thus considered an appropriate option. Data was analyzed using Smart PLS (Ringle, Wende, & Will, 2005), an easy-to-use PLS path modeling software (Temme, Kreis, & Hildebrandt, 2010). Additional analyses were conducted using SPSS for significance tests of indirect effects (Preacher & Hayes, 2008), and a customized spreadsheet created by Henseler et al. (2009) for multi-group analysis.

**Data preparation for PLS analysis.** There were 84 missing values in the data set, which accounted for 5.46 % of the total number of values with regard to the study variables. Little’s MCAR test (Little & Rubin, 1987) was performed and it was found that these values were missing completely at random (chi-square= 71.693, df = 87, \( p = .882 \)). Since the missing values did not reflect hidden systematic patterns, using Smart PLS’s default imputation option of mean substitution to handle these missing values was deemed appropriate. After inserting the missing values with calculated means, a data set with 171 complete cases was obtained. A rule of thumb for robust PLS modeling suggests the sample size should be equal to the larger of the following: 1) ten times the
largest number of formative indicators used to measure a latent variable, or (2) ten times the largest number of structural paths directed at a particular dependent latent variable (Barclay, Higgins, & Thompson, 1995; Chin 1998). Applying this rule, a sample of 171 in this study was considered a sufficient prerequisite for robust PLS path modeling.

*Figure 3-4.* The conceptual model.

The Kolmogorov-Smirnov test of the residuals of all the eight variables showed that group impacts, group age, group size, and meeting frequency were significantly
skewed. Therefore, multivariate normal distribution was not present, which makes it suitable to use PLS path modeling. PLS is a distribution-free approach to regression and path modeling and uses bootstrapping resampling (a standard feature in SmartPLS) to test the significance of the beta coefficients for the paths measuring the relationships between latent variables. But an important assumption of PLS modeling is linearity. ANOVA test of linearity was applied to examine the linear relationships among all variables. The variables in the data conformed to the assumption of linearity; no significant deviation from linearity was found. Lastly, all of the variables were tested for multicollinearity. The variance inflation factor (VIF) values were all well below 10 and the tolerance statistics (1/VIF) were all well above .2 (Menard, 1995; Myers, 1990), indicating that multicollinearity was not a problem among the variables.
Notes

1 These 100 groups were randomly selected from the database of all the ongoing groups listed under Meetup.com when the request was made.
2 Local population size was classified based on the four categories of metropolitan statistical areas (MSAs) (http://www.census.gov/population/www/metroareas/mastand.html), that is, Level A MSAs corresponding with 1 million or more local population, Level B MSAs with 250,000 to 999,999, Level C MSAs with 100,000 to 249,999, and Level D MSAs with less than 100,000. The locale data related to the 100 random groups represents 42% of Level D MSAs, 18% of Level C, 23% of Level B, and 17% of Level A.
3 External ties, leadership team and leadership change (in lagged form) were analyzed as covariates representing “state” in the Cox regression model. These variables were meant to indicate whether a group has ever experienced the target event, that is, whether a group has constructed an external tie, has shared leadership, or has experienced leadership change over the course of group development; thus they were not recorded at various points in time.
4 The information about the age distribution of Meetup groups was provided by the research team of Meetup.com, who also helped generate the sample.
5 Meetup users’ high-level privacy concerns were observed at the earlier stage of interview data collection.
6 Compared with the population, the groups participating in the survey sample tended to be older (sample mean = 25.21 months, population mean = 22.28) and have a larger membership size (sample mean = 219.04, population mean = 141.16). The meeting frequency of the sampled groups was no substantially different from those in the population (sample mean = 3.28, population mean = 3.10). The information about the population parameters was provided by the research team of Meetup.com.
7 See Chapter 4 for more detailed findings from the interview data.
8 SmartPLS output generates unstandardized latent variable scores for network communication and group impacts. In the network communication, six items (NC1-6) were included. The item of communication with personal contacts was not included because of its low factor loading (0.569). Including this item also reduced the AVE of network communication below the threshold of .50. Six items (OC1-6) were included to represent the latent variable of group impacts.
9 One of the six items measuring density of resources received had a factor loading below 0.60 (0.502), but it was still included considering the construct validity of this measurement. Moreover, the AVE was still above the threshold of 0.50 when including this item.
Chapter 4

An Inductive Approach to Understanding Mixed-Mode Groups

This chapter reports the first of the series of studies conducted on Meetup groups, focusing on uncovering the evolutionary processes of groups in the form of enacting variation-selection-retention (V-S-R) mechanisms, as well as the outcomes of group sustainability. An overview of the research questions is provided, followed by the presentation of the findings from analysis of interviews with Meetup organizers. The theoretical and practical implications of these findings are discussed with the aim of providing insights into the phenomenon of mixed-mode groups.

Overview of Study Part One

From an evolutionary perspective, groups experience the V-S-R processes as the basis of change and survival in the environment (Campbell, 1965). For mixed-mode groups, potential variations may come from recruitment and advertisements, state of member attendance, interaction with other groups and the physical environment, organizing structure and the content of group activities. From the moment groups form, they engage in different levels of trial-and-error experiments with these variations; some of the useful variations will then be selected and retained as part of regular group operation later on.

Meanwhile, from an ecological perspective, especially McPherson’s (1983a, 1988) model, it is conjectured that mixed-mode groups’ interaction with the environment will influence the continuity of groups. In order to grow and survive, groups rely on their
environments through which social, physical and temporal resources can be gleaned. In light of this, the first two research questions ask:

RQ1: How are the processes of V-S-R (e.g., the way a group starts, the way a group recruits members, the physical locale of a group) reflected in the formation of mixed-mode groups?

RQ2: How are the processes of V-S-R (e.g., interaction within and across groups, interaction with local venues) reflected in the continuity of mixed-mode groups?

As proposed in the ecological perspective, a group may survive through the formation and maintenance of intergroup links. Specifically, the greater number of links constructed offers the group greater capacities to detect and respond to changes in the environment, and see a greater probability to actually modify its environment (McPherson, 1983a). Put it another way, behaviors of human groups will invariably affect the environment; for example, certain stores, restaurants, and bowling alleys are patronized because group activities take place in these places and money is spent in them (Homans, 1950). The third research question thus asks:

RQ3: What are the forms and outcomes of collective action by sustained mixed-mode groups?

Findings

The research site of this study was Meetup.com, a website designed to facilitate the creation of groups and coordination of offline groups meetings among users based on shared interests and physical location; that is, the formation and coordination of mixed-mode groups. Analysis of the interviews with 34 Meetup group organizers was used to identify the emerging patterns of how those groups engage in the V-S-R processes at
different stages of group development. Different forms and outcomes of collective action performed by those groups were also examined. See Table 3-1 in Chapter 3 for the detailed information about the 34 groups studied.

**V-S-R Processes and Formation of Meetup Groups**

RQ1 asked how the V-S-R processes were reflected in the formation of mixed-mode groups. Interviews revealed that most groups adopted combined methods of traditional word-of-mouth and unique online functions, including the website of Meetup.com itself and online searching affordances. This organizer of a hiking group (NVHikingGroup¹) described his offline advertising efforts that resulted in a series of relationship switches from offline to online and then from online to offline:

Mainly it was business cards, actually. We printed out cards, and we’d meet people on the trail and just start talking to them and hand them a business card. And definitely, most of our members - or we have - the ones that we actually recruited were definitely word of mouth. You know, we just told them about the hiking group. A lot of them said, “Wow, that sounds cool. I’d like to come out.”

The traditional ways of advertising through member social networks were also observed in these Meetup groups. Organizers’ social networks in particular played an important role in getting the group off the ground in terms of spreading the word out and providing input. Organizers tended to pass along the message about their newly created Meetup groups among their professional and social networks.

In addition to traditional recruitment, groups were able to take advantage of the technological affordances of online search functions to recruit members. The website of Meetup.com itself served as a big search engine for potential members to find the group based on the parameters they entered in the system. An organizer of a social group (WISocialGroup) mentioned his experience:
I did try advertising on Craigslist during the first couple of weeks. I also put out fliers. But neither activity made much difference. Basically, people who had heard about Meetup.com through other ways joined Meetup and then found my group when browsing the list of nearby groups. So the group has grown rapidly with very little effort on my part.

Understandably, it seems there was a natural tendency for people to join a group that shows some promise of success, at least as manifested by a large membership size, which is publicly available on the webpage of these groups. In some situations, the public presence of group meetings increased visibility and attracted potential members’ attention. For example, organizers would unfold supplementary materials such as table tents in the place where they held the meetings. Another effective way of promoting groups was to spread the message in the places that may be relevant to group events. An organizer of a gaming group in Canada mentioned that he promoted the group mostly through role playing game (RPG) community contacts and through convention goers. Similarly, another organizer of a small breed dogs group (WIDogGroup) described his advertising approach:

One of the venues that we use is a doggy daycare. And what I do is I take her cards and I hand them out. And by me handing her cards out, I say, “This is where we have our Meetup group.” Her name as a doggy daycare is getting out there because I’m handing out the cards. And she’s allowing me to use her facility as a meetup site.

Interestingly, the way the organizers of these voluntary groups recruited members and promoted groups did not seem too different from what is typically practiced by businesses. Organizers were seen to proactively hunt down potential members through the website of Meetup.com by sending out individualized emails to prospective members, or contact people by searching through the profiles on online dating websites.
Figure 4-1. The iterative processes of V-S-R in the evolution of Meetup groups.

**Group Formation**

**Variations (recruitment and advertisements)**
- active word-of-mouth through organizers’ or members’ social networks
- passive online search
- active contact with potential members
- visibility of meeting in public places
- spreading the word out through possible meeting venues

**Variations (group topics, structure and policy)**
- specification of group policy (e.g., requirements of photo posted)
- levels of topic focus

**Selection and retention (recruitment and advertisements)**
- active word-of-mouth through organizers’ or members’ social networks
- passive online search
- active contact with potential members
- visibility of meeting in public places
- spreading the word out through possible meeting venues

**Selection and retention (group topics, structure and policy)**
- specification of pre-set group policies (e.g., requirements of photo posted)

**Group Continuity**

**Variations (logistics)**
- locations for meeting
- cooperation from local venues

**Variations (group topics, structure and policy)**
- specification of group policy (e.g., requirements of photo posted, inappropriate behavior, problems with members’ RSVP)
- levels of topic focus
- organizing structure (besides the organizer)
- group transition (e.g., leadership change, interest demand by members)

**Variations (links and networks)**
- seeking out opportunities for cooperation
- being reached by other groups/organizations
- member-member relationships developed

**Selection and retention (recruitment and advertisements)**
- passive online search
- visibility of meeting in public places

**Selection and retention (logistics)**
- regularized locations for meeting

**Selection and retention (group topics, structure and policy)**
- specification of group policy
- levels of topic focus
- segmentation of activities
- creation of spin-offs
- regularized organizing structure

**Selection and retention (links and networks)**
- regular joint events with other groups
- cooperation with other organizations (e.g., sponsorships)
- sub-group activities maintained
At the formation stage, variations, as well as the selection and retention, were mainly concerned with the advertising and recruitment aspects (see Figure 4-1). Groups usually experimented with different locations for meeting without finalizing any decisions. Nevertheless, the variation in the form of the specification of group policy differed across groups. In some cases, photo posting as a requirement for membership was clearly mentioned in the group descriptions on the group webpage and this policy was maintained at later stages. In other groups, policies were produced in response to situational demands that arose later on, which will be described in the following section.

**Processes of V-S-R and Continuity of Meetup Groups**

After a group is formed, the necessity of handling logistics and connections within and across groups becomes critical to maintaining group continuity (RQ2). The choice of physical location had a discernible impact on various facets of group operation. For example, organizers reported difficulties in finding a meeting place that could accommodate the growing number of members. Meanwhile, the nature and type of group activity often entailed specific requirements for locations. An organizer of a meditation group mentioned her experience of changing meeting places due to her group activity. This organizer of a sports watching group (COSportsGroup) specified group preferences for the multimedia surroundings:

One of the biggest things about it is we wanted to have the sound of the football game. So like a lot of bars or a lot of restaurants, they only have, you know, the option to play the sound of one game. And the bar that we go to has three different areas. And they can play a different game sound, you know, at each of the different areas.

Organizers reported that they were well received by local venues and in some cases groups were being actively reached by those local businesses. For example, it was
not uncommon to see groups obtaining cooperation from the local establishments, such as reserving a meeting space for groups or providing them with group discounts. Yet depending on the group, the connections with these businesses might be a one-time business transaction, with no deeper ties being cultivated. Other strategies were also experimented with and selected over various alternates to keep the group going, such as seeking out opportunities or being reached by other interested groups/organizations to organize joint events. An organizer of a new technology group had local businesses serving as group sponsors who reached him through Meetup.com. After a number of sluggish meetings, an organizer of another new technology group decided to seek out cooperation with a similar Meetup group.

Internally, as a group developed further, organizing structure took shape while interpersonal relationships were formed between members. Different organizing structures were observed depending on the nature of the group topic. In groups with focused activities (e.g., concert going, rock climbing), help from assistant organizers seemed to be minimal since the organizer could easily handle the planning and organizing portions, whereas in groups with diverse activities (e.g., social), organizers tended to tap into the expertise of their assistant organizers on different fronts. If no help came from inside the group, organizers would solicit help from their personal networks, such as workplace colleagues or friends, at least in terms of getting ideas for events. Some organizers also implemented group policies for dealing with occurrences such as business solicitations, inappropriate or harassing behavior, or lower than expected attendances due to inaccurate RSVPs by members. Meanwhile, personal relationships were observed to develop among members, which became a possible motivator for
members to continue participating in group activity. Nonetheless, as some organizers pointed out, these relationships may in some way lead to shifts in communication and activity from the group level to the smaller and private level. Hence, those members no longer attended group meetings.

**Group transition.** In some groups, group transition occurred as a result of leadership change and subsequent “turbulence.” Among the 34 participating organizers, 17 were not the originators of their groups. These organizers recounted the situations before and after they took over the group. An organizer of a culture group mentioned he needed to make a quick decision whether to take over the group after receiving a 24-hour email alert from Meetup.com; otherwise, the group would close down. By taking over, he would need to tackle various issues, including working with current assistant organizers, member turnover, or clarification of group policies. This organizer of a sports watching group (NCNASCARGroup) described the situation of turnover when the original organizer left:

> So, after she (the previous organizer) left, a lot of them left. So, it was hard to build -- it was hard to go ahead and start to build the group. The early meetings there was only sometimes two or three people that would come. So, that was a big battle. I think now that I’ve been patient enough, and I think after about a year and a half, that it’s started really gettin’ goin’ and more people became interested.

Group transition also took another form: that of segmentation of group activities. An organizer of a vegetarian group (NJVegGroup) mentioned, “We’re getting to the point now where we need to start segmenting and finding ways to have things at all these different locations and that’s gonna require help from the members…”

**Characteristics of stable groups.** When a group morphed into a stable group, it usually had the characteristic of new attending members mixing with the existing ones
over time. To some extent, the growing size of the attendance may matter less than maintaining a stable turnout. This organizer of a gaming group (CAGameGroup) explained the state of his group:

I would describe the growth of this group as a nice even, and steady pace. We do not get massive influxes of outgoing members. This, I find to be a very good sign, as this goes to show that D&D still remains as it always was, not a fad, but a very fun staple game for all members of the family.

Another organizer of a sports watching group (COSportsGroup) mentioned that they only meet during the season, but the stable turnout keeps the momentum of her group.

I’d be thrilled if we end up with 50 people, you know, are coming to watch the game with us, but I’m okay. As long as people have a good time, it’s not that big of a goal. We don’t really have a goal of getting a certain size. As long as members have a good time meeting people with the same interests and getting along, we’re happy.

A group can also sustain itself with routine self-organizing among several assistant organizers, even when the organizer leaves. The new organizer could inherit the logistic responsibilities, such as the meeting location and the original organizing structure. This organizer of a climbing group (MAClimbGroup) said:

I know that Jeff was not the first who started it (the group). The Meetup group was about to die and Jeff then took over because he felt it was a great idea. I actually still don’t know who really started it. It’s kind of being handed over from one to the other one.

Note that 10 organizers (out of 34) were followed up till July, 2011 due to the observation of group closure, leadership change and ostensible activity change, and two of them closed their groups down not long after the first-time interview. For these two cases, they explained that the reason leading to group closure was partially because they did not find their Meetup group help achieve their set goals to recruit new members to their existing activities. Among another two organizers of sport watching groups who
disbanded their groups on Meetup.com, one moved the group to Facebook while the other
joined another similar Meetup group.

In the meantime, after probing further, 11 organizers (out of 34) mentioned their
experience of organizing their other relatively inactive and declining Meetup groups.
Common reasons associated with group decline were: difficulty in scheduling, lack of
clear group goals, unpopular group topics, and the unsuitable locale. An organizer of a
philosophy group (MDThinkGroup) described that he had two identical groups in two
urban areas, but one turned out very well while the other did not. He solicited members
of the laggard group for feedback for improvement, but only a few responses were
received. He suspected that the different residential populations were the main reason
contributing to this outcome; college students might not be as interested in this group
topic as the older and working population in another location. Another organizer
(TXSpiritualGroup 2) mentioned that she also tried different strategies to accommodate
members’ scheduling preferences, but these did not work out. These results imply that
these inactive groups had engaged in the process of variation, but were unable to find an
optimal strategy, thus leading to closure of the group.

Collective Action of Meetup Groups

RQ3 asked about the forms and outcomes of collective action by sustained
groups. Collective actions of these groups were manifested through different levels of
activity focus, creation of spin-off groups, joint events with other Meetup groups, and
interaction with the local community. Groups were observed to differ in their levels of
focus; in other words, some groups tended to limit their group activity to events directly
relevant to the group topic, such as jazz concerts, rock climbing, social chats, or watching
sports events. Others diversified their activities, such as mixing social and volunteer activities (e.g., park cleanup, fundraising for social causes). But generally, the attendance at any one meeting was far lower than the membership size as listed on the group webpage. Organizers revealed that as groups became stable, a core group of loyal members would emerge. And for each meeting, there were often new faces or visitors mixed with regular attendees. In some groups with diverse activities, members had the tendency to only participate in specific events that interested them.

**Spin-off groups.** Interestingly, the generation of spin-off groups from the original groups was mentioned by nine organizers (out of 34). These spin-off groups were mainly developed out of the need for members to have a separate group devoted to their interests. For example, members in a women’s social group organized among themselves a separate dancing *Meetup* group. Similarly, an organizer of a small breed dogs group created another *Meetup* group with the special focus on Westie dog keepers. The motivation may also be linked to the specific geographic location that delimits the spin-off group. An organizer of one walking group started another walking group in a town one hour’s drive away from the area where her original group was located because she bought a house in the new area. She kept both of the groups, but relied more on her assistant organizers’ help to keep the original group going.

According to the participating organizers’ descriptions, the impact of the formal spin-off groups on the original group was generally perceived in a positive light, given that these sub-group activities enabled interaction among members with closer common interests. The downside, however, was also observed in that smaller groups of people tended to develop their own personal relationships and thus no longer participated in
bigger group after a while. This type of sub-group activity would then lead to the departure of group members.

**Joint events with other groups.** Notably, certain groups tended to organize joint events with other Meetup groups, born out of the direct ties that organizers or assistant organizers had with other Meetup groups. In other words, if organizers or assistant organizers had another Meetup group for which they also served as the organizer, they would either cross-post events on both groups or organize events together. Even if they were just members of another group, they were likely to arrange joint events by cooperating with the organizer of the other group. An organizer of a social group (OHNITGroup) mentioned how her group was connected to other similar Meetup groups:

…certain groups that I have a connection with. Like I would know them from the other – being in those groups. Maybe they’d come up with an idea, and I first would say to them, “Hey, is it okay if I copy your idea, you know, do a joint meetup?” And I’d ask permission at first. And then now it’s to the point where, with certain groups, they’re just like, “Hey, whatever you want to do, just post it or you know, just copy it. So I guess most of the groups that work together well, but again I’ve known them with you know, going along with the different events. You meet them. You see a lot of people that seek, you know, about three or four different groups.

To a large degree, the locale and the characteristics of the group had much to do with the initiation and implementation of joint events. For example, an organizer of a classic book club mentioned she was welcomed by the local community and was contacted by local organizations (e.g., library) for cooperation. Not surprisingly, inflow communication from other organizations or Meetup groups also occurred when a group reached a certain group size. Generally, from the perspective of members, joint events provided them with an opportunity to know people from different groups and learn about
other groups that they might not otherwise be aware of. From the perspective of the
group, joint events can also help recruit new members.

**Local interaction.** Common to those Meetup groups under study were the
contributions they have made to local establishments and their community. An organizer
of a vegetarian group mentioned that he held group meetings at certain restaurants to
support their businesses, while another organizer of a women’s social group tended to
arrange events at restaurants that are owned or run by women. This organizer of a hiking
group (NVHikingGroup) explained his group’s involvement in reciprocating favors:

….with all these people that we have, I want to use them to do good things and to
help the community. And you know, we’ve gotten so much out of [the city] that
it’s nice to give something back, …we have adopted very popular trails in all
three of those places. So we do maintenance on the trail. We clean trash off the
trail and so on.

Furthermore, in some groups, they had incorporated interaction with local community as
part of group activities. This organizer of a new technology group (COTechGroup)
described how his group activity served as a venue to connect community and college:

I was talking with people about what has happened, and I kind of talked with one
of the professors up at the local college, which is the University of ABC
(pseudonym used for confidentiality). And it became clear that they did not have a
clear vehicle to get what their mission was into the community, and the community
didn't have a clear way of going from the community into the school. .. So it’s kind
of, again, in this two-way street as a way for this school to come out and for the
community to go in. And the meeting has become kind of this vehicle for all this
to occur.

…We are adding to the ability of -- for example, here ….where the Parks
Departments would’ve liked to do something, but they can’t, for two reasons: one,
because it’s illegal and, two, because they don't have the money. But they’re very
happy that we can bring the service so that they can provide the service, because
we are volunteers. So it is like we augment the capacity of the city to deliver
certain services (Organizer of a beekeeping group).
Discussion

The growing use of the Internet to organize face-to-face meetings has generated a new form of voluntary associations--mixed-mode groups, which are characterized by a multimodal form of building connections and relationships through online interaction and face-to-face meetings. Using Meetup.com as the research site, this study (Part I) illustrates the evolution of mixed-mode groups by looking at the processes of V-S-R in the formation and continuity of Meetup groups and the forms and outcomes of collective action by surviving groups. In sum, findings from interviews suggest Meetup group organizers engaged in the V-S-R processes at different stages of group development in order to build and strengthen the fitness of the group. The strategies mentioned included various online and offline recruitment efforts made at the formation stage, and the connections built both within and outside of the group for logistic arrangements at later stages. The relative advantages and disadvantages of these connections were further manifested in different aspects, such as group transition as a result of leadership change, formation of subgroup activities and/or spin-off groups, joint events with other groups, and interaction with local communities.

This study (Part I) offers contributions to evolutionary theories in terms of (a) applying an evolutionary perspective to voluntary groups, especially technology-mediated groups; (b) identifying the iterative V-S-R processes as manifested at different stages of group evolution; and (c) examining the forms and outcomes of collective action by surviving groups.
Evolution of Mixed-Mode groups

The advantage of the evolutionary perspective is its ability to explain phenomena using the same theoretical process at different levels (Monge et al., 2008). Applying the evolutionary perspective to understand the growth, decline, disbanding and survival of mixed-mode groups, this study extends the existing evolutionary research concentrated in formal task-oriented organizations to the domain of technology-mediated voluntary groups. Specifically, the results showed the different ways these Meetup groups built and strengthened their fitness through word-of-mouth and online searching recruitment, focused/segmenting activities, cooperating with other groups/organizations, and interacting with local establishments and community. These groups were also able to explore their link and network fitness both within and across groups. It was suggested that communication links with other Meetup groups were preferred and thus were relatively fit for groups with diverse activities, but were less fit for groups with focused topics. Similarly, links with local community organizations were likely being sought and thus fit for a stable group, compared with a group still struggling with a low member turnout.

In the meantime, the negative impact of sub-group activity on the group overall, as occurring in some groups under study, has been mentioned in other research. For example, Sessions (2010) found that face-to-face meetings may encourage attending members to stay in the online community, but they may also reduce the dynamics of the community as a whole. From the evolutionary perspective, it appears that the fitness of the links between members engaging in sub-group activities may interfere with the fitness of the larger group network. Such multilevel fitness dynamics (Monge et al., 2008) were
addressed as part of the variation process. As shown in the results, organizers tended to deal with this tension by encouraging the creation of a spin-off group, segmenting group activities, or just choosing not to act.

**Niches of mixed-mode groups.** Research on the notion of “niche” suggests that organizations or populations of organizations possess varied capacities to procure resources and exploit these resources in the environment (Hannan & Freeman, 1977; McPherson, 1983a; McKelvey 1982; Popielarz & Neal, 2007). Niche width is conceptualized as an organization’s variance in resource utilization, and the dichotomy of generalists (with wide niche) and specialists (with narrow niche) is posited accordingly (Hannan & Freeman, 1989). Analysis of interviews suggests that niches of mixed-mode groups can be defined by the range of physical proximity within which a group can recruit members; they can also be determined by the group topics, given the online search and matching functionalities (especially on Meetup.com). Meetup.com users can locate the groups they are interested in joining based on the parameters of group topics and groups within a certain radius.

Findings from interviews imply that there are variations in the strategies that groups act on when dealing with other groups occupying differential or overlapping niches. For example, in a college town, several broadly defined sports-and-recreation Meetup groups developed into a strong alliance. In another suburban town, a Meetup group focused on the immigrant culture topic tended to cooperate with other social groups in the same area in the form of joint-events or cross-posting events for each other. Further research can help identify how certain topics or combination of topics, as well as
geographic locations, influence the formation of interdependence among mixed-mode
groups occupying the “niche” space.

V-S-R in Phases of Mixed-Mode Group Evolution

Older groups are more likely to experiment with different strategies in terms of recruting members, organizing activities, and interacting with entities outside of the group. Hence, the trial-and-error process can be said to take place not only at the initial formation stage but also at later stages of group evolution. Participating organizers mentioned the recruitment strategies of active referrals and passive online searching were learned over time. Later on, groups were faced with other challenges such as retaining members and finding locations for meeting. Yet, compared with the formation stage, results showed that established groups tended to experience both blind and intentional variations at later stages. The former variation refers to the random events that occur in organizations and their environments that prompt them to respond, while the latter refers to the actions that an organization actively takes to solve problems (Aldrich, 1999; Monge & Contractor, 2003). In other words, at later stages, in addition to anticipated challenges, groups were observed to tackle unexpected opportunities (e.g., being contacted by a local organization) and issues (e.g., the sudden departure of the leader). For those groups that can endure longer, they are likely to adapt through these variations, which may prove fruitful.

The processes of V-S-R in networks can also help explain the links and networking that are tried, formed, and dissolved in different phases of a group’s evolution. As mentioned earlier, groups were being contacted by other groups or local organizations, which can be seen as blind variations. There were certainly more cases in which
organizers actively seek out potential sponsors, accommodating local venues, and other Meetup groups to cooperate with, which can all be treated as intentional variations. In the relatively long-lived groups under study, it was common for the relationship with the local venue where group events were held to be retained, after these groups tried out alternatives and finally settled on the selected one (Zajac & Olsen, 1993).

When a group moves into a stable phase, strategies selected and retained from the previous phase may be modified or even abandoned. For example, while still relying on the search function of Meetup.com for getting new members, organizers mentioned they stopped using promotion materials when they held the event at public places because they thought it was no longer needed. This indicates that in mixed-mode groups, adaptations processes of V-S-R can be iterative as groups evolve (Freeman, 1981). Moreover, the V-S-R processes can occur simultaneously. As illustrated in Figure 4-1, strategies that groups tried out at the formation stage may remain unselected (the top right arrow) or become selected and retained (the downward arrow) as groups evolved. Some strategies selected and retained from the formation stage may remain selected and retained (the bottom right arrow) while others became modified or abandoned (the upward arrow) as groups proceeded to the phase of continuity. In the interim, groups also encountered other new sources of variation and engaged in different rounds of V-S-R processes.

These findings also highlight an important question to explore further; namely, the role of technological affordances in influencing the V-S-R mechanisms enacted by technology-mediated organizations in general and mixed-mode groups in particular. It may be possible that certain technological features (e.g., online search and group webpage listing group details) serve as sources of variation for recruitment at the
formation stage, but they can also be sources of variation for retaining members at later stages.

**Collective Action of Surviving Mixed-Mode Groups**

Under the evolutionary perspective, survival is the ultimate pursuit for all entities. The longitudinal analysis of the 100 random *Meetup* groups (in Chapter 5) showed a higher mortality rate for groups aged less than one year. Therefore, examining how groups that survive this threshold generate different outcomes becomes a salient question. Findings from this study showed that surviving groups engaged in different forms of collective action. It can be argued that, consistent with club theory (Sandler & Tschirhart, 1980), benefits of collective action (e.g., relationship development) are exclusive only to group members who attend the meeting. Yet in general, group information and activities are also being documented online, where absent or inactive members can still catch a glimpse of the past activities. In other words, those members can reap limited benefits in the form of public goods (e.g., getting communal information or direct connections with other members electronically) (Fulk et al., 1996). A related term describes these inactive members as “on paper only” (Smith, 1972), for whom the group may be of minimal impact in most cases (Smith, 1999). Therefore, technological affordances like this imply that outcomes of surviving mixed-mode groups’ collective action may need to be understood differently in online and face-to-face contexts.

On the other hand, this study shows that public goods were generated by surviving mixed-mode groups in the form of interactions with local venues or the local community. For example, groups visited local restaurants to keep the business open, which was advantageous to the local economy and community overall. Together, these
findings indicate that outcomes of surviving mixed-mode groups would be better explained by integrating club theory and public goods theory. Future research can study whether and how the generation of these two types of outcomes of collective action is mutually beneficial or disadvantageous to a group. For instance, it is possible that by stimulating online interaction among all members, a group is likely to have good turnout, which helps produce public goods to the local community.

**Conclusion**

This chapter presents the results of employing an ecological and evolutionary perspective to understand and explain the evolutionary processes of mixed-mode groups. Through interviews with Meetup group organizers, it was found that groups engaged in different strategies to build and strengthen their fitness, including multimodal recruitment and interaction with their environments. More importantly, groups were observed to experience iterative and simultaneous V-S-R processes as they evolved. Groups also exhibited collective action of various forms, and many of them involved the local community.

**Limitations**

There are three key limitations in this study (Part I). First, drawing on interviews with group organizers using Meetup.com, findings might be biased by the participating organizers, who were more likely to be successful organizers. But extra efforts have been made to encourage organizers to share their thoughts about less active groups they also organized. Second, the evolution of groups on Meetup.com may not adequately represent the general phenomenon of mixed-mode groups. Future research can expand to different formats of mixed-mode groups for comparison purposes. Third, relying on interviews to
understand the over-time dynamics of group change may limit the findings. Other sources of data should be used in future study, such as archived data with historic records of groups.

Despite these shortcomings, this exploratory study extends the evolutionary and ecological perspective to the domain of voluntary groups, especially technology-mediated mixed-mode groups. Findings demonstrated the iterative and simultaneous processes of V-S-R in different phases of group evolution. Referencing public goods theory and club theory, findings of this study also provided insights into different forms and outcomes of collective action by surviving mixed-mode groups, which can be understood by considering the different benefits that accrued to attending members and to absent/inactive members. The influence of technological affordances was suggested to be linked to the V-S-R processes as well as the outcomes of collective action by surviving mixed-mode groups. In sum, this study helps add social understanding of the growing use of the Internet for face-to-face group activities by uncovering the dynamic change and evolutionary processes of mixed-mode groups.
Notes

1 See Table 3-1 in Chapter 3 (Methodology) for the detailed information about the 34
groups being studied and the pseudonyms used for the groups.
2 Pseudonym used to protect confidentiality.
3 Generic name used for confidentiality.
Chapter 5
A Multilevel View of Mixed-Mode Groups

This chapter reports the second of the series of studies conducted on Meetup groups, investigating the evolutionary processes at group and population levels as well as the internal and external dimensions of evolution. An overview of the research questions and hypotheses is provided, followed by the presentation of the results from analysis of interviews with Meetup organizers as well as the longitudinal analysis of the archived group data. The theoretical and practical implications of these findings are discussed, emphasizing the empirical significance of delving into the evolution of mixed-mode groups across different levels.

Overview of Study Part Two

As mentioned in Chapter 2, building on Baum and Shipilov’s (2006) discussion and the multilevel feature of evolutionary theory, one research question and a set of hypotheses are developed with the aim of examining the ecology and evolution of mixed-mode groups at both group and population levels. In response to the call for identifying variation-selection-retention (V-S-R) mechanisms at different levels of analysis (organizations, populations, community) (Monge & Contractor, 2003; Monge & Poole, 2008), a general research question asks:

RQ4: What are the V-S-R processes in the evolution of mixed-mode groups at (a) the group and (b) the population level?

Existing research has primarily delved into the ecological processes of organizations (e.g., niche, density dependence) and the demography of organizations (e.g., age and size of organizations) (Baum, 1999). For the former, narrow organizational
niches have been found to be positively correlated with mortality rates (Dobrev et al., 2001). Increased competition may also contribute to failure rates at different stages of population development (Hannan & Carroll, 1992; Hannan & Freeman, 1987, 1988, 1989). For the latter, predictions have been proposed associating age dependence with organizational survival, for example the “liability of newness” (Freeman et al., 1983; Stinchcombe, 1965). Research has also identified various demographic factors (e.g., resource insufficiency, leadership change, interpersonal conflicts, narrow focus) linked to organizational closure (Chambré & Fatt, 2002; Fernandez, 2008; Wollebæk, 2009). It is hypothesized that dissolutions of mixed-mode groups are also influenced by these demographic factors, such as profit orientation and leadership structure.

Additionally, establishing institutional links and being embedded in a network of weak and strong ties to other organizations can incur survival advantages for organizations. Such ties to the environment have been found to provide organizations with legitimacy and access to resources (Baum & Oliver, 1991, 1992; Fernandez, 2008; Hager et al., 2004; Selle & Øymyr, 1992). Building on existing research concerning ecology and demography of formal organizations, the following hypotheses are developed regarding the effects of various factors on group survival, including group niches, population density, group age, profit orientation, leadership change and external ties.

H1: Group niches affect the survival of mixed-mode groups.

H2: Population density affects the survival of mixed-mode groups.

H3: Older mixed-mode groups are more likely to survive than younger groups.

H4: Profit orientation affects the survival of mixed-mode groups.
H5: Leadership factors (e.g., leadership structure, leadership change) affect the survival of mixed-mode groups.

H6: External ties affect the survival of mixed-mode groups.

Results

In this study (Part II), data were drawn from in-depth interviews conducted with 34 Meetup group organizers and archived data of 100 random Meetup groups over 18 months of observation. The former was used to answer RQ4a via a grounded approach, while the latter was used to answer RQ4b and test the six hypotheses through survival analysis. See Table 3-1 in Chapter 3 for more detailed information about the 34 groups being interviewed.

The V-S-R Processes of Meetup Groups

RQ4a asked about how Meetup groups engage in the V-S-R processes over the course of group development. Interviews revealed that groups enacted different V-S-R mechanisms depending on the stage of group development (see Table 5-1). When a group was first created, organizers mostly focused on the aspect of recruitment and advertising; the strategies they used included combined ways of traditional word-of-mouth and unique online search affordances. For example, this organizer of a philosophy group (MDThinkGroup 1) described his advertising efforts:

I know when I talk with them, they, of course, I tell them about my group and a lot of groups and a lot of people join, ’cause we do some cool things. So, just pretty much, other than the Meetup page, I’ve talked to people at other Meetup groups.
Table 5-1

*The V-S-R Mechanisms Enacted by Meetup Groups at Different Stages*

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<th>Group Formation</th>
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<th>Group Continuity</th>
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<th>Links and Networks</th>
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<td>Group Topics, Structure &amp; Policy</td>
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<td>Recruitment &amp;</td>
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<td>Variation</td>
<td>active word-of-mouth through organizers’ or members’ social networks</td>
<td>specification of group policies (e.g., requirements of photo posted)</td>
<td>locations for meeting</td>
<td>specification of group policy (e.g., requirements of photo posted, inappropriate behavior, problems with members’ RSVP)</td>
<td>levels of topic focus</td>
<td>locations for meeting cooperation from local venues</td>
<td>seeking out opportunities for cooperation</td>
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<td></td>
<td>passive online search</td>
<td>levels of topic focus</td>
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<td>levels of topic focus</td>
<td>organizing structure (besides the organizer)</td>
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<td>being reached by other groups/organizations</td>
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<td>actively contacting potential members</td>
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<td>group transition (e.g., leadership change, interest demand by members)</td>
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<td>member-member relationships developed</td>
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<td>spreading the word out through possible meeting venues</td>
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<td>Selection and Retention</td>
<td>active word-of-mouth through organizers’ or members’ social networks</td>
<td>specification of preset group policies (e.g., requirements of photo posted)</td>
<td>passive online search</td>
<td>specification of group policy</td>
<td>segmentation of activities</td>
<td>regularized locations for meeting</td>
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<td>levels of topic focus</td>
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<tr>
<td></td>
<td>actively contacting potential members</td>
<td></td>
<td></td>
<td></td>
<td>creation of spin-offs</td>
<td></td>
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<td></td>
<td>visibility of meeting in public places</td>
<td></td>
<td></td>
<td></td>
<td>regularized organizing structure</td>
<td></td>
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<tr>
<td></td>
<td>spreading the word out through possible meeting venues</td>
<td></td>
<td></td>
<td></td>
<td>self-organized leadership</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>a stable turnout</td>
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Another organizer of a new technology group (COTechGroup) mentioned his strategy of recruiting members by infusing a community spirit in the activity:

I try to set up where it’s not my event. I was trying to set it up as the community’s event, so that they’re proud of it and they want to participate in it and that they want to bring their friends and that they want to present and that they wanna actually engage with it and tell other people about it. It’s been very much word of mouth. We haven't done commercials or advertising or anything like that.

Notably, groups were able to take advantage of the technological affordances of online search functions to recruit members. The website of Meetup.com itself was observed to serve as a big search engine for potential members to find groups, based on the parameters they enter in the system. An organizer of a social group (OHSocialGroup) mentioned his experience:

_Organizer:_ I don’t have to recruit members, word of mouth. People will find it by keywords searches.
_Interviewer:_ By...? On the website?
_Organizer:_ By keyword searches. When you go into Meetup, it will ask you what your interests are. And if you say it's volunteers and voluntary community service or nightlife or movies or dining; adventure, travel, running, or tennis - and those keyword searches - somebody will go off of those. My group will - or groups will be identified through that.

Organizer of a small breed dogs group (WIDogGroup) reported his multimodal organizing enabled through different online channels:

I have a Facebook account and a Craigslist account and a Myspace account. And when I schedule a group, I’ll post that on my, you know, on my other - on Facebook or Meetup or Craigslist. And it brings in a couple of members. It’s brought in a couple of members. Like a friend of mine from high school who has the Facebook saw that I was on, you know, organizing this.

Essentially, the technological affordances of search engines were critical in determining the niche a group can occupy in the population. The organizer of a social philosophy group (OHTThinkGroup) mentioned the effects of search engine functionality, both on Meetup.com and on the web, on the growth of the group.
And the bigger we get, the easier it is to search us. Because more and more people talk about the group, then they find Meetup and they keep using words that will pull out for a search engine. And that makes it easier for people to then find our group though these words that they use. They don’t even realize they’re doing it. ….. When a group is formed of that interest or topic they are notified. Meetup.com takes care of that sort of thing. And it’s up to the - we have members themselves put their parameters. In other words, they’ll be looking for a group that forms within 25 miles of their location. They can go up to 50 miles. I think the most is 100 miles. Because of that we have got members from as far away as the Mansfield, Ohio area. That’s an hour and a half drive from Cleveland. We got one from the Michigan area. So, yeah, it’s really - those people have to find us.

In terms of logistics, groups usually experimented with different locations for meeting, and rarely had such decisions finalized at the initial stage. But specification of group policy differed across groups. In some cases, photo posting as a membership requirement was clearly mentioned on the group webpage and this policy was maintained at later stages. But in other groups, policies were later initiated in response to situational demands.

**Group continuity.** After several meetings, a group started to face the necessity of handling logistics and connections within and across groups. The choice of the physical location had a discernible impact on various facets of a group’s continued operation. For example, organizers reported difficulties in finding a meeting place that can accommodate a growing membership. Meanwhile, the nature and type of group activity often entailed specific requirements for locations. For example, this organizer of a gaming group (CAGameGroup) specified group preferences for the location:

*Organizer:* Actually, the location for the meetup events was preset when I took over. However, the current location at the [place ABC] (generic name used for confidentiality) was a “no brainer” as it is the single largest store in the city of Calgary that caters to our particular community/ demographic.

*Interviewer:* If it is a public place, like a restaurant or a park, how did you get it prepared? Do you need to do certain things, like talking to the restaurant owner or the park authority?
Organizer: The [place ABC] was designed with having a public gaming facility in mind, actually. We needed only to schedule our events with the store events coordinator, and the coordinator sets aside space and time for our event to take place at regular intervals.

The strategies organizers found useful at the initial stage may nevertheless be dropped later due to changes in the group situation. Below are two examples exhibiting these iterative V-S-R processes.

Originally when I first started the group, I actually asked people when they came for the first time to kind of sign in and say how they found it. I don’t do that anymore because it’s just - it’s just too many people to deal with now and stuff like that (Organizer of a political philosophy group- PAThinkGroup).

Organizer: When I first opened the group, Meetup automatically sent the e-mails to people on the waiting list for walking and hiking. And then you can also go to the waiting list and personally e-mail each person to ask them to join your group. So I did that ‘cuz I was pretty ambitious. I made a message like “Please join my group yada yada,” and then I would write the person’s name in and I sent that to at least 150 people.

Interviewer: Individually.

Organizer: Yeah, ‘cuz you can do that. Now I would never do that ‘cuz eventually people find the group and they join (Organizer of a walk group- MIWalkGroup)

External and internal ties. Organizers reported that they were well received by local venues and in some cases groups were being actively reached by local businesses. For example, it was not uncommon to see groups obtaining cooperation from the local establishments, such as reserving meeting space for groups or providing them with group discounts. An organizer of a new technology group had local businesses that reached him through Meetup.com serve as group sponsors. Yet depending on the group, the connections with these businesses may be a one-time business transaction, with no deeper ties cultivated. The organizer of a social group (OHNITGroup) described her contact with the local venues where she wanted to hold group events:

We always as much as, you know, we always love to communicate with the restaurant, you know, that we do have a group coming. And for example, the
IMAX tomorrow, we’re getting a group discount. I have to go check with them ahead of time. You know, we’ll be able to get a group discount and save a couple dollars on that. So, you know, we always check the place. And a lot of times, you know, depending on the place, we’ll go to the place, check it out, to talk to the management depending on the situation or what the deal is. So yeah. There’s, you know, at least a phone call or going there, but usually just a phone call is good enough.

Other strategies were used and selected to keep the group going, such as joint events. Certain groups tended to organize joint events with other Meetup groups, on the basis of direct ties that organizers or assistant organizers had with those Meetup groups. In other words, if organizers or assistant organizers had another Meetup group they also served as the organizer, they would either cross-post events on both groups’ pages or organize events together. The initiation and implementation of joint events also occurred with regard to the locale and the characteristics of the group. For example, an organizer of a classic book club mentioned she was welcomed by the local community and was contacted by local organizations (e.g., library) for cooperation. Another organizer of an adventure group (MIADGroup) described her personal links with other groups that facilitated intergroup links:

And so the Europeans are not all students. Half of them are actually young professionals. And I just happened to meet up with them because I work on campus. So I go to the tabling events that all the clubs and organizations have every year, which is how I found them. And then because they’re closer to my age and they are just as active - and basically invited them to some of the Meetups, or we do our own thing with them.

Internally, as a group developed further, an organizing structure took shape while interpersonal relationships were formed between members. Different organizing structures were observed depending on the nature of the group topic. In groups with focused activities (e.g., concert going, rock climbing), help from assistant organizers seemed to be minimal, since the organizer could easily handle the planning and
organizing portions. In groups with diverse activities (e.g., social), organizers tended to use the expertise of their assistant organizers on different fronts. If no help was available from inside the group, organizers would solicit help from their personal networks, such as workplace colleagues or friends, at least in terms of generating ideas for events. Some organizers also implemented group policies for dealing with occurrences such as business solicitations, inappropriate or harassing behavior, or lower than expected turnout due to inaccurate RSVPs by members.

Meanwhile, personal relationships were observed to develop among members, which became a possible motivator for members to continue participating in group activity. Nonetheless, as some organizers pointed out, these relationships may sometimes lead to a shift of communication and activity away from the group level to a smaller and more private level; these members no longer attended group meetings. The organizer of a language group (CAESLGroup) witnessed this change in her group:

Meetup (group) became extremely big. It surges over 1,000 members and what was happening was that there was a lot of parties and -- or house parties and the group became known for these parties and a lot of people joined specifically to go to these parties. So once that kind of died down because some of those members left - well, they left the group or some of them left the city, you know, from those activities died down and I - also by then people had made good enough friends that they were no longer using Meetup as an opportunity to create events, that we were making private events through eVite or just - you know - it’s personal e-mail.

**Group transition.** In some groups, group transition occurred as a result of leadership change and subsequent “turbulence.” But it was not uncommon to see a group sustain itself with routinized self-organizing among several assistant organizers, even after the organizer left. A new organizer could then inherit the logistic arrangements such as the meeting location and the original organizing structure. Group transition could
also take another form, that of segmentation and expansion of group activities. An organizer of a social philosophy group (OHThinkGroup) described:

Once it reached a certain amount of members, it was clear that a lot of members were interested in not just talking and blabbing and then eating for dinner. They really want to get into some more active type things. So we’re trying to branch out the best we can into those sort of areas.

The V-S-R Processes of the Population of Meetup Groups

After 18 months of observation, 46 out of 100 Meetup groups were found to have closed down (see Figure 5-1 for the presentation of survival and hazard function). To test the hypotheses, a series of Kaplan-Meier survival analyses and Cox regression models were conducted. At the exploratory stage, in which the variable time is considered to be the only significant factor for group closure to occur, non-parametric Kaplan-Meier analysis is useful to identify important differences in groups stratified by the key variables under study. The results of Kaplan-Meier analysis showed that there were significant differences between groups on the dimensions of profit orientation, leadership structure, external ties, and leadership change, indicating not-for-profit Meetup groups and groups with a leadership team, with external ties, and/or experiencing leadership change had a longer survival time (see Table 5-2 and Figure 5-2a-d). However, there was no reliable difference between groups with and without member requirements.

Among the 46 groups closing down, 38 groups (82.6%) were aged one year or younger. A significant age difference was found between ongoing groups ($M = 40.91, SD = 22.06$) and closed groups ($M = 15.04, SD = 11.67$) ($t(83) = 7.48, p < .001$), thus H3 was supported, suggesting younger groups had a higher possibility of closure than older groups. To test the rest of the hypotheses, all the variables were entered in the Cox
regression model. The results revealed that the number of other Meetup groups existing within a radius of 25 miles (H2) \( (B = .953, p = .058) \), profit orientation (H4) \( (B = 1.614, p < .001) \), leadership team \( (B = -1.094, p < .05) \), the experience of leadership change (H5) \( (B = -1.455, p < .01) \), and external ties (H6) \( (B = -1.935, p < .001) \) significantly influenced group survival (see Table 5-3). Population density and profit orientation were positively correlated with group closure, meaning that a greater number of other nearby Meetup groups and profit orientation increased the probability of group closure. On the other hand, the existence of a leadership team, experience of leadership change, and possession of external ties were negatively associated with group closure, indicating these factors helped reduce the chance of group closure. Member requirement was not a significant predictor of survival time (H1). Hence, except for H1, all the hypotheses were supported.

In answering RQ4b, these above results suggest that variation may come from a combination of several elements, including ecological factors, demographic features, and network configurations. But evolutionary processes led to the selection and retention of older and not-for-profit groups, living under low population density and surviving with a leadership team and leadership change in the population of Meetup groups. These selected and surviving groups also maintained external ties with other groups or organizations, be they inside or outside the population of Meetup groups.
Figure 5-1. Survival and hazard function of 100 Meetup groups during an 18-month period of observation. Note that survival function refers to the cumulative proportion of groups surviving to a given time (i.e., how many months passed before the average group is closed?) and hazard function represents the probability of a group experiencing the event (closure) at a given point in time, conditional on having survived until that time (i.e., distribution of risk across times).
Table 5-2

*Results from Kaplan-Meier Survival Analysis on Key Factor Variables*

<table>
<thead>
<tr>
<th></th>
<th>Profit Orientation</th>
<th>Leadership Structure</th>
<th>External Ties</th>
<th>Leadership Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not-for-profit</td>
<td>For-profit</td>
<td>With links</td>
<td>Without links</td>
</tr>
<tr>
<td></td>
<td>With leadership team</td>
<td>Without leadership team</td>
<td>Having leadership change</td>
<td>No leadership change</td>
</tr>
<tr>
<td>M</td>
<td>66.943</td>
<td>14.500</td>
<td>84.157</td>
<td>37.178</td>
</tr>
<tr>
<td>S.E.</td>
<td>5.125</td>
<td>2.906</td>
<td>5.508</td>
<td>5.286</td>
</tr>
<tr>
<td>95% CI UL</td>
<td>76.988</td>
<td>20.196</td>
<td>94.952</td>
<td>47.537</td>
</tr>
<tr>
<td>95% CI LL</td>
<td>56.897</td>
<td>8.804</td>
<td>73.362</td>
<td>26.818</td>
</tr>
<tr>
<td>$\chi^2$ (Log Rank test)</td>
<td>39.357***</td>
<td>22.775***</td>
<td>36.838***</td>
<td>17.908***</td>
</tr>
</tbody>
</table>

***p < .001
Figure 5-2(a). Profit orientation and survival time (blue line: not-for-profit groups; green line: for-profit groups).

Figure 5-2(b). Leadership team and survival time (blue line: groups without a leadership team; green line: groups with a leadership team).
Figure 5-2(c). External ties and survival time (blue line: groups without external ties; green line: groups with external ties).

Figure 5-2(d). Leadership change and survival time (blue line: groups without leadership change; green line: groups with leadership change).
Table 5-3

Results from Cox Analysis

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>B</td>
<td>Sig.</td>
<td>Exp(B)</td>
<td>B</td>
</tr>
<tr>
<td>Local population size</td>
<td>-.077</td>
<td>.615</td>
<td>.926</td>
<td>.025</td>
</tr>
<tr>
<td>Residential mobility</td>
<td>.020</td>
<td>.349</td>
<td>1.021</td>
<td>.037</td>
</tr>
<tr>
<td>Density I (log)</td>
<td></td>
<td></td>
<td></td>
<td>.953</td>
</tr>
<tr>
<td>Density II (log)</td>
<td></td>
<td></td>
<td></td>
<td>-.724</td>
</tr>
<tr>
<td>Member requirements</td>
<td></td>
<td></td>
<td></td>
<td>-.197</td>
</tr>
<tr>
<td>Profit orientation</td>
<td></td>
<td></td>
<td></td>
<td>1.614</td>
</tr>
<tr>
<td>External ties</td>
<td></td>
<td></td>
<td></td>
<td>-1.935</td>
</tr>
<tr>
<td>Leadership team</td>
<td></td>
<td></td>
<td></td>
<td>-1.094</td>
</tr>
<tr>
<td>Leadership change</td>
<td></td>
<td></td>
<td></td>
<td>-1.455</td>
</tr>
<tr>
<td>(lagged)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>-2 log-likelihood</td>
<td>326.369</td>
<td></td>
<td>257.978</td>
</tr>
<tr>
<td></td>
<td>$G^2$</td>
<td></td>
<td></td>
<td>68.391</td>
</tr>
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</table>

Note. The positive B coefficient (with odds ratios above 1) implies an increase in the probability of group closure. $G^2$ refers to the value of chi-square change from Model 1 (with locale and residential mobility only) to Model 2, in this case, $G^2=68.391$, $p=.000$, $R^2=1 - e^{-(68.391)/100} = 0.495$, indicating the strength of association between the set of covariates and survival time (Allison, 1995). Allison, P. D. (1995). Survival analysis using the SAS system: A practical guide. Cary, NC: SAS Institute Inc.

Leadership change was transformed with a lagged from to avoid the problem of simultaneity.

Discussion

This study employs an ecological and evolutionary perspective to examine an emerging form of voluntary associations, mixed-mode groups, and analyzes the evolutionary process at group and population levels. Using Meetup.com as the research site, this study (Part II) illustrated the iterative processes of V-S-R mechanisms enacted at different stages of group development; it also unraveled the V-S-R processes manifested at the population level, which in turn helped identify the organizational forms that have
existed, and especially which ones have been selected and retained in the population. Specifically, consistent with existing research on organizational ecology and evolution, the results identified several predictors of survival: the ecological factor in the form of population density; demographic factors represented by group age, profit orientation, and leadership; and external links. All of these were critical in predicting the survival of the 100 Meetup groups being observed over 18 months.

This study (Part II) offers contributions to evolutionary theories in terms of (a) applying the evolutionary theory to technology-mediated mixed-mode groups; (b) examining the evolutionary processes of mixed-mode groups at multiple levels in the same study; and (c) enriching the ecological and evolutionary research by considering technological affordances of mixed-mode organizing.

**An Ecology and Evolutionary Perspective of Mixed-Mode Groups**

Applying an ecological and evolutionary perspective to understand the growth, survival, and disbanding of mixed-mode groups, this study extends the existing evolutionary research concentrated in formal and well-structured organizations to the domain of technology-mediated voluntary associations. There are similarities between the ecological and evolutionary processes of mixed-mode groups and those that have been studied in existing research. For example, results of age dependence and group survival are consistent with the prediction of “liability of newness” as explored in work and traditional face-to-face voluntary organizations (Bielefeld, 1994; Fernandez, 2008; Freeman et al., 1983; Hager et al., 2004; Selle & Øymyr, 1992; Twombly, 2003). The positive effects of shared leadership and leadership change on survival of mixed-mode groups can also be found in existing studies on work organizations (e.g., Carson, Tesluk,

In line with the research showing the usefulness of institutional embeddedness for organizational survival (Baum & Oliver, 1991; Baum et al., 2000), findings of this study indicate the important role that external ties played in the growth and survival of groups at group and population levels. In the voluntary association domain, it is known that having certain interorganizational linkages, such as those with local organizations and businesses and other voluntary associations, is conducive to greater longevity of voluntary associations (Selle & Øymyr, 1992). Interview data suggests that group organizers engaged in different ways to build and strengthen their fitness over time through cooperation with other Meetup groups and organizations, as well as by interacting with local establishments and the community. Moreover, the existence of ties at the individual level, like those between organizers and social actors outside of the group, in many cases helped foster actual and potential interaction at the group level.

While groups can benefit from such external links, organizers of certain groups tended to strike a balance between group goals and external influence. In other words, some organizers insisted on maintaining their groups as a social or dialogue group, instead of a service group. To some extent, this observation speaks to the argument dealing with boundary work, as a group embedded in its environment faces the challenge of maintaining group identity while opening itself to opportunities by interacting with external actors (Ancona & Caldwell, 1988; Sundstrom et al., 1990; Yan & Louis, 1999). Future research can follow this direction and examine how boundary work influences group survival.
Archived data was analyzed, focusing on the existence of communicative links between a Meetup group and entities outside of the group. Note these links at the population level were not further distinguished in terms of being within or across the populations. Yet based on Monge et al.’s (2008) conceptualization of link fitness, it can be posited that links with other Meetup groups within the population may be fit because they are relatively easy to initiate and sustain, for example, through cross-posting events or joint events. Links with local establishments and other organizations across populations may also have fitness values because they provide different resources to Meetup groups (e.g., places for meeting, group discounts). It thus would be a salient topic for future study to look at different dimensions of link fitness and network fitness, because they are critical to group and population survival.

**A Multilevel View of Mixed-Mode Group Evolution**

The advantage of the ecological and evolutionary perspective is its ability to explain phenomena using the same theoretical process at different levels (Monge et al., 2008). The multilevel analysis also allows for the investigation of V-S-R processes enacted within and outside the organization (Aldrich, 1999; Aldrich & Ruef, 2006; Monge et al., 2011a). Interview data revealed that Meetup group organizers engaged in a variety of strategic actions, including recruitment, leadership structure, activity type, and external activity. In other words, organizers played a critical role in influencing the internal evolutionary process of the group. Indeed, as Miner (1994) points out, an organizational manager’s job is to monitor how the evolutionary processes at the higher level affect the whole organization, and to influence the internal evolutionary process. This is exemplified in the case of Meetup groups under study.
In response to a call for more efforts to make the level of analysis as explicit and inclusive as possible (Monge & Contractor, 2003), a mixed approach of interviews and archived group data used in this study affords the ability to articulate which level of the ecosystem is being investigated. Specifically, echoing the dynamic conceptualization of macro-and micro-niches (McKelvey, 1982), the V-S-R processes enacted by Meetup groups imply that individual groups lay down a micro-organizational niche in the population of Meetup groups by adapting themselves to the environment. Their V-S-R mechanisms then flow to and from the entire population, which in turn leads the population to carve out a macro-population niche in the environment accordingly. That also indicates the iterative V-S-R processes enacted at the micro-group level may be represented in those taking place at the macro-population level.

Regarding group disbanding, cost is a major reason singled out by a number of participating organizers leading to the decision for group closure on Meetup.com. For example, two organizers explained that they closed their groups on Meetup.com because they did not find a Meetup presence helped achieve their set goals to recruit new members to their existing business activities. Another organizer of a sports watching group mentioned that her group migrated to Facebook, another population of mixed-mode groups, because it costs nothing, whereas she paid the subscription fees to Meetup.com as the single organizer of her group. The traits of these “less fit” individual groups may together reflect the niche attributes at the population level of Meetup.com. It can be argued that Meetup.com is carving out its macro-population niche and co-exists with other free-of-charge populations of mixed-mode groups such as Facebook and BigTent, in the larger environment. Further, the selection event of group closure on
Meetup.com and group creation in another population can be described as a cross-level V-S-R process, because the selection at the lower group level reflects the adaptations and transformations at the higher level of populations (Monge et al., 2011b).

On the basis of this multilevel conceptualization of evolutionary processes, future research could delve more into how different populations of mixed-mode groups interact with each other in the form of commensalism; that is, how organizations or groups from similar populations engage in competition and/or cooperation with one another (Aldrich, 1999; Monge & Contractor, 2003). Another potential topic would be studying the phenomenon of group migration among similar (from Meetup.com to Facebook) or dissimilar populations (from Meetup.com to a business networking website) as this would help provide insight into the evolutionary dynamic at group, population and community levels.

**Technological Affordances: Mixed-Mode Organizing**

This study applies an ecological and evolutionary perspective to understand and explain whether, when, and how mixed-mode groups survive or disband; it also helps enrich this perspective by considering technological affordances of mixed-mode organizing. Organizers interviewed mentioned that they employed a mixed approach of word-of-mouth and online search engines when trying to recruit members. Some of the organizers also used online platforms other than Meetup.com for coordination and communication. The notion of mixed-mode organizing proposed here has two implications.

First, results from the longitudinal analysis suggest that population density and external ties have significant effects on group survival. For a given Meetup group, other
Meetup groups or groups from other online populations could be seen as competitors or collaborators seeking similar or dissimilar resources from the online environment. But when it comes to offline meetings, a Meetup group is influenced not only by other mixed-mode groups, but also by other organizations, businesses, and the locale. In fact, the non-significant effect of group niches (measured by group member requirements) on survival found in this study further implies the need to develop a more accurate set of measures that can tap into the ecology and environment of mixed-mode groups, as they are subject to the environment in both online and offline forms. This study makes a first attempt at incorporating mixed-mode environments in the analysis of the evolution of mixed-mode groups. Future research is needed to provide more fine-grained conceptual and methodological approaches investigating this technological implication.

Second, mixed-mode groups are afforded mixed-mode organizing, which may result in differential outcomes of collective action, depending on members’ status of attending meetings. As is suggested in club goods theory (Cornes & Sandler, 1996; Sandler & Tschirhart, 1980), benefits of collective action may be exclusive only to group members who attend the meeting (e.g., relationship development). However, group activities are generally documented online, where absent members or inactive members can still catch a glimpse of the past activities. In other words, those other members can still enjoy limited benefits in the form of communal public goods (getting communal information) and connective public goods (direct connections with other members electronically) (Fulk et al., 1996). Therefore, technological affordances like this imply that outcomes of surviving mixed-mode groups may need to be understood differently in online and face-to-face contexts.
Conclusion

This chapter employs an ecological and evolutionary perspective to examine the ecology and the evolutionary processes of mixed-mode groups at group and population levels. Through interviews with 34 Meetup organizers and a longitudinal analysis of 100 Meetup groups, this study illustrated the internal processes of V-S-R mechanisms enacted at different stages of group development as well as the V-S-R processes manifested at the population level. Results of this study mostly coincided with existing research on organizational ecology and evolution, suggesting that population density, group age, profit orientation, leadership factors, and external links were critical in predicting the survival of groups. The multilevel analysis allows further interpretation that the V-S-R processes can take place across group and population levels.

Limitations. There are at least four limitations in this study (Part II). First, analyses from both interviews and archived data did not differentiate the reasons for group decline and closure. Thus, caution should be used when interpreting the results. Second, the interviews were of course affected by interviewees’ incomplete memories and other cognitive limits. Third, because the study drew on interviews with group organizers using Meetup.com, findings may be biased, as the participating organizers were likely successful organizers. But extra efforts have been made to prompt the organizers to share their thoughts about less active groups they also organized. Fourth, the evolution of Meetup groups may not adequately represent the general phenomenon of mixed-mode groups. Future research will need to expand to different populations of mixed-mode groups.
Despite these shortcomings, this study makes a contribution by applying an evolutionary and ecological perspective to technology-mediated mixed-mode groups, and demonstrates the V-S-R processes at both group and population levels. Findings of this study also contribute to the ecological and evolutionary scholarship by incorporating technological affordances of mixed-mode organizing in the related conceptualization and analysis. It is believed that, with the growing use of the Internet for face-to-face grouping activities, the phenomenon of mixed-mode groups will attract more attention and research.
Chapter 6

Investigation of Impacts of Mixed-Mode Groups

This chapter presents the last of the series of studies conducted on *Meetup* groups, examining the dynamics of groups’ strategic actions in contributing to positive outcomes in the form of internal and external group impacts. An overview of the hypotheses and research question is provided, followed by the presentation of the results from analysis of an online survey with *Meetup* organizers. The theoretical and practical implications of these findings are discussed with the aim of providing insight into the impacts of mixed-mode groups.

**Overview of Study Part Three**

As mentioned in Chapter 2, by drawing on theories of resource dependence (Pfeffer & Salancik, 1978, 2003) and the literature of group boundary spanning (Ancona, 1990; Ancona & Caldwell, 1988, 1992), it is suggested that mixed-mode groups may engage in boundary work that encompasses internal and external strategies in order to obtain resources necessary for group operation. Empirically, research has consistently shown the positive influence of both internal and external strategies on group outcomes. Hence, it is hypothesized that engaging in internal (H7a) and external (H7b) strategies will have positive effects on impacts of mixed-mode groups.

H7a: The more strategies a mixed-mode group uses involving internal group processes, the more likely a group will perceive the impacts of collective activity.

H7b: The more strategies a mixed-mode group uses involving external actors, the more likely a group will perceive the impacts of collective activity.
According to resource dependence theory and research of boundary spanning, resource acquisition is the central mechanism driving boundary spanning activity and external networking. In concrete terms, it is believed that incorporating the notions of social capital and social embeddedness in the ecological and evolutionary framework can help shed light on the process of how organizations and groups secure resources and maintain existence by tapping into their social networks. Reflecting these arguments, a second set of hypotheses is thus proposed to investigate the usefulness of mixed-mode groups’ external communication in obtaining resources, which in turn affects the generation of group impacts.

H8a: The more a mixed-mode group engages in external communication with network contacts, the more likely a group will receive resources necessary for group operation.

H8b: The more a mixed-mode group receives resources necessary for group operation, the more likely a group will perceive the impacts of collective activity.

Under the ecological and evolutionary perspective, as organizations explore the networking environment and decide who to connect with, they essentially perform strategic choices (Aldrich & Pfeffer, 1978; Monge et al., 2008). That is, initiating and maintaining communication links with external contacts can be considered as part of organizations’ strategic actions. Considering the importance of external communication for mixed-mode groups to acquire resources, two hypotheses are proposed to examine the relationship between the use of strategies and the receipt of resources through external communication.
H9a: More frequent external communication helps a mixed-mode group to acquire resources when implementing internal strategies.

H9b: More frequent external communication helps a mixed-mode group to acquire resources when implementing external strategies.

Previous studies have shown the enhanced effect of external strategies on group outcomes through the frequency of external communication (Ancona & Caldwell, 1992b; Keller, 2001). It is presumed that receiving resources from external contacts may matter more when groups engage in external strategies than in internal strategies. The last hypothesis thus suggests that, relative to internal strategies, external strategies will exhibit differential effects on group outcomes through network communication and resource acquisition.

H10: Compared with internal strategies, implementing external strategies is more likely to facilitate group impacts when groups engage in more frequent network communication and acquire resources.

An important characteristic of mixed-mode groups is the technological affordance of mixed-mode organizing across mediated and face-to-face modes. It is true that numerous research efforts have identified the benefits of mixed-mode communication in various aspects of group coordination or even group outcomes; yet research is situated in either well-defined task settings or in online communities dominated by computer-mediated communication (CMC) activity, leaving much ambiguity about the applicability of these findings to other contexts, such as voluntary associations. Under the ecological and evolutionary perspective, it is inferred that multimodality is a critical determinant of group organizing. In light of this, a general research question is posed:
RQ5: How is the degree of mixed modality incorporated in organizing and producing the impacts of mixed-mode groups?

Results

To test the hypotheses and answer the research question, an online survey was conducted with 171 Meetup group organizers, and data was analyzed using partial least squares (PLS) path modeling. Figure 3-4 (in Chapter 3) presents the conceptual model based on the hypotheses listed. According to Chin (1998), PLS models can be evaluated through 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, measurement and structural models are assessed on the basis of these criteria, after which the results of hypothesis testing will be reported. A multi-group analysis was conducted to answer the research question concerning the influence of mixed modality on group impacts.

Evaluation of PLS Model Results

A measurement model is typically assessed based on its reliability and validity (Henseler et al., 2009). Note that except for network communication and group impacts, other variables were measured with a single indicator and thus were not included in this part of assessment. For the assessment of reliability, outer loadings of all indicators for network communication 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 6-2). There
was also evidence of sufficient convergent and discriminant validity. First, the average variance extracted (AVE) for network communication 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’ variance on average (Chin, 1998; Fornell & Larcker, 1981; Gotz et al., 2009). Second, the AVE of network communication and group impacts was greater than their squared correlations with any other constructs, meaning each latent variable shares more variance with its own assigned indicators than with another latent variable representing a different block of indicators (Chin, 1998; Fornell & Larcker, 1981; Gefen et al., 2000; Gotz et al., 2009) (see Tables 6-1 and 6-2). 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 as shown in Table 6-3 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 output produced the results of the R-square for the three endogenous variables: impacts ($R^2 = .234$), resource acquisition ($R^2 = .470$) and network communication ($R^2 = .428$), meaning 23% of the
### Table 6-1

**Summary of Intercorrelations among the Study Variables**

| Variables                  | 1  | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 10  |
|----------------------------|----|---------|---------|---------|---------|---------|---------|---------|---------|-----|-----|
| 1. Group Age               | -  |         |         |         |         |         |         |         |         |     |     |
| 2. Group Size              | .548** | -       |         |         |         |         |         |         |         |     |     |
| 3. Meeting Frequency       | .035 | .043    | -       |         |         |         |         |         |         |     |     |
| 4. Internal Strategies     | .177* | .308** | .271**  | -       |         |         |         |         |         |     |     |
| 5. External Strategies     | .183* | .344** | .161*   | .457**  | -       |         |         |         |         |     |     |
| 6. Network Communication   | .144† | .400** | .185*   | .442**  | .630**  | -       |         |         |         |     |     |
| 7. Density of Resources    | .076 | .365** | .153†   | .342**  | .529**  | .687**  | -       |         |         |     |     |
| 8. Diversity of Resources  | .097 | .252** | .108    | .364**  | .489**  | .595**  | .861**  | -       |         |     |     |
| 9. Resources (second-order)* | .090 | .320** | .136†   | .366**  | .528**  | .665**  | .965*** | .964*** | -     |     |     |
| 10. Impacts                | .189** | .178*  | .229**  | .396**  | .318**  | .302**  | .264**  | .266**  | .275**  | -  |     |

# of items | 1<sup>a</sup> | 1<sup>b</sup> | 1<sup>c</sup> | 1<sup>d</sup> | 1<sup>e</sup> | 6 | 6 | 1<sup>f</sup> | 2 | 6


SD | 20.532 | 289.67 | 4.138 | 1.986 | 2.365 | .653 | .624 | 1.857 | .899 | .756

**Note.** Total number of participants, N = 171.

<sup>a</sup>Group Age=one item measuring observed group age, group size=one item measuring observed membership size, meeting frequency=one item measuring observed meeting frequency.  
<sup>b</sup>Internal strategies=the sum of ten items; external strategies= the sum of eight items.  
<sup>c</sup>Diversity of resources= the sum of six items measuring occurrence of receiving resources from contacts.  
<sup>d</sup>Resource acquisition is a second-order construct consisting of density and diversity of resources received.  
<sup>†</sup>p < .10, <sup>*</sup>p < .05, <sup>**</sup>p < .01
### Table 6-2

**Reliability and Validity of Multi-Indicator Latent Variables**

<table>
<thead>
<tr>
<th>Construct</th>
<th>AVE</th>
<th>Composite Reliability</th>
<th>Cronbach’s alpha</th>
<th>Indicator</th>
<th>Mean</th>
<th>SD</th>
<th>Loading</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Communication</td>
<td>.509</td>
<td>.861</td>
<td>.806</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NC1</td>
<td>1.88</td>
<td>.918</td>
<td>0.663</td>
<td>11.230</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NC2</td>
<td>2.12</td>
<td>.883</td>
<td>0.623</td>
<td>11.473</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NC3</td>
<td>1.70</td>
<td>.877</td>
<td>0.802</td>
<td>23.732</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NC4</td>
<td>2.09</td>
<td>.973</td>
<td>0.681</td>
<td>10.355</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NC5</td>
<td>1.82</td>
<td>.924</td>
<td>0.796</td>
<td>23.096</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NC6</td>
<td>1.88</td>
<td>1.115</td>
<td>0.700</td>
<td>14.269</td>
</tr>
<tr>
<td>Density of Resources&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.500</td>
<td>.854</td>
<td>.796</td>
<td>DR1</td>
<td>2.48</td>
<td>1.035</td>
<td>0.502</td>
<td>5.673</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DR2</td>
<td>1.44</td>
<td>.714</td>
<td>0.797</td>
<td>17.161</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DR3</td>
<td>1.76</td>
<td>.996</td>
<td>0.605</td>
<td>6.415</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DR4</td>
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<td>.834</td>
<td>0.796</td>
<td>17.101</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DR5</td>
<td>1.96</td>
<td>1.069</td>
<td>0.717</td>
<td>10.690</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DR6</td>
<td>1.63</td>
<td>.914</td>
<td>0.776</td>
<td>14.317</td>
</tr>
<tr>
<td>Resources (second-order)</td>
<td>.930</td>
<td>.964</td>
<td>.925</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DeR&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.722</td>
<td>.624</td>
<td>0.968</td>
<td>162.951</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DiR</td>
<td>2.919</td>
<td>1.857</td>
<td>0.961</td>
<td>102.807</td>
</tr>
<tr>
<td>Impacts</td>
<td>.609</td>
<td>.903</td>
<td>.874</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OC1</td>
<td>4.15</td>
<td>1.013</td>
<td>0.768</td>
<td>15.845</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OC2</td>
<td>4.55</td>
<td>.790</td>
<td>0.781</td>
<td>14.663</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OC3</td>
<td>4.44</td>
<td>.919</td>
<td>0.763</td>
<td>14.986</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OC4</td>
<td>4.06</td>
<td>1.059</td>
<td>0.792</td>
<td>14.300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OC5</td>
<td>3.92</td>
<td>1.031</td>
<td>0.826</td>
<td>22.064</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OC6</td>
<td>3.39</td>
<td>1.262</td>
<td>0.752</td>
<td>18.378</td>
</tr>
</tbody>
</table>

*Note.* <sup>a</sup>Factor loadings of the indicators of diversity of resources were calculated separately in the initial model when the second-order construct of resources was not present. <sup>b</sup>DeR=density of resources, DiR=diversity of resources.
Table 6-3

*Factor Loadings and Cross Loadings of Measures*

<table>
<thead>
<tr>
<th></th>
<th>Network Communication</th>
<th>Impacts</th>
<th>Resources</th>
<th>Group Age</th>
<th>Group Size</th>
<th>Meeting Frequency</th>
<th>Internal Strategies</th>
<th>External Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC1</td>
<td><strong>0.663</strong></td>
<td>0.259</td>
<td>0.405</td>
<td>0.165</td>
<td>0.269</td>
<td>-0.020</td>
<td>0.290</td>
<td>0.406</td>
</tr>
<tr>
<td>NC2</td>
<td><strong>0.623</strong></td>
<td>0.301</td>
<td>0.351</td>
<td>0.113</td>
<td>0.263</td>
<td>0.171</td>
<td>0.395</td>
<td>0.336</td>
</tr>
<tr>
<td>NC3</td>
<td><strong>0.802</strong></td>
<td>0.145</td>
<td>0.532</td>
<td>0.120</td>
<td>0.303</td>
<td>0.157</td>
<td>0.252</td>
<td>0.546</td>
</tr>
<tr>
<td>NC4</td>
<td><strong>0.681</strong></td>
<td>0.380</td>
<td>0.436</td>
<td>0.105</td>
<td>0.300</td>
<td>0.179</td>
<td>0.404</td>
<td>0.388</td>
</tr>
<tr>
<td>NC5</td>
<td><strong>0.796</strong></td>
<td>0.263</td>
<td>0.542</td>
<td>0.088</td>
<td>0.292</td>
<td>0.183</td>
<td>0.340</td>
<td>0.572</td>
</tr>
<tr>
<td>NC6</td>
<td><strong>0.700</strong></td>
<td>0.041</td>
<td>0.567</td>
<td>0.027</td>
<td>0.290</td>
<td>0.113</td>
<td>0.238</td>
<td>0.413</td>
</tr>
<tr>
<td>OC1</td>
<td>0.157</td>
<td><strong>0.768</strong></td>
<td>0.248</td>
<td>0.183</td>
<td>0.181</td>
<td>0.152</td>
<td>0.317</td>
<td>0.195</td>
</tr>
<tr>
<td>OC2</td>
<td>0.156</td>
<td><strong>0.781</strong></td>
<td>0.242</td>
<td>0.061</td>
<td>0.139</td>
<td>0.161</td>
<td>0.250</td>
<td>0.215</td>
</tr>
<tr>
<td>OC3</td>
<td>0.208</td>
<td><strong>0.763</strong></td>
<td>0.221</td>
<td>0.000</td>
<td>0.045</td>
<td>0.176</td>
<td>0.260</td>
<td>0.213</td>
</tr>
<tr>
<td>OC4</td>
<td>0.266</td>
<td><strong>0.792</strong></td>
<td>0.232</td>
<td>0.204</td>
<td>0.120</td>
<td>0.199</td>
<td>0.345</td>
<td>0.220</td>
</tr>
<tr>
<td>OC5</td>
<td>0.274</td>
<td><strong>0.826</strong></td>
<td>0.138</td>
<td>0.151</td>
<td>0.165</td>
<td>0.185</td>
<td>0.301</td>
<td>0.282</td>
</tr>
<tr>
<td>OC6</td>
<td>0.337</td>
<td><strong>0.752</strong></td>
<td>0.215</td>
<td>0.293</td>
<td>0.185</td>
<td>0.205</td>
<td>0.394</td>
<td>0.372</td>
</tr>
<tr>
<td>DeR</td>
<td>0.691</td>
<td>0.265</td>
<td><strong>0.968</strong></td>
<td>0.076</td>
<td>0.365</td>
<td>0.153</td>
<td>0.342</td>
<td>0.529</td>
</tr>
<tr>
<td>DiR</td>
<td>0.598</td>
<td>0.270</td>
<td><strong>0.961</strong></td>
<td>0.097</td>
<td>0.252</td>
<td>0.108</td>
<td>0.364</td>
<td>0.489</td>
</tr>
</tbody>
</table>

Variance of group impacts, 47% of the variance of resource acquisition and 43% of the variance of network communication were explained by the model. These values approximate or exceed the criterion of $R^2 = .26$ (Cohen, 1988) for large effect sizes, supporting the evidence of the hypothesized model’s adequate explanations for the data. Second, an F-test was conducted to assess whether the model is a significant fit to the data overall. The results showed that the four predictors together (internal strategies, external strategies, network communication, resources) 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, which was obtained as the geometric mean of the average communality index (outer measurement model) and the average $R^2$ value of the endogenous latent variables (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). It ranges from 0 to 1, where the higher value represents better path model estimations (Henseler et al., 2009). The GoF value of the model was 0.614, which exceeded the cut-off value of 0.36 for large effect sizes of $R^2$ (Wetzels, Odekerken-Schröder, & van Oppen, 2009). In sum, these different test results indicate a good prediction performance of the model overall.

**Hypothesis Testing**

Hypotheses were tested by examining the significance of the path coefficients through asymptotic t-statistics, which were obtained by bootstrapping resampling (500 samples) (Chin, 1998). Figure 6-1 and Table 6-4 present the estimates obtained from PLS analysis. Results showed that the path from the two control variables—group age and meeting frequency—significantly predicted group impacts. Both internal and external strategies significantly predicted network communication, which in turn affected resource acquisition. Note 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 the network communication-resource link ($\beta = .156, t = 2.257, p < .05$). As such, H8a, H9a, and H9b were supported. 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 communication and resource acquisition ($\beta = .173, t = 2.292, p < .05$). Based on these results, it indicates that
H7a and H10 were supported while H7b was partially supported. Nonetheless, the results failed to find a positive effect of resource acquisition on group impacts, thus H8b was not supported.

Table 6-4

*PLS Path Estimators*

<table>
<thead>
<tr>
<th>Path Coefficients (standardized)</th>
<th>T-value</th>
<th>P-value</th>
<th>Total Effect</th>
<th>T-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Strategies</strong> -&gt; Network Communication</td>
<td>0.546***</td>
<td>9.173</td>
<td>&lt; .001</td>
<td><strong>0.458</strong>*</td>
<td>6.345</td>
</tr>
<tr>
<td><strong>External Strategies</strong> -&gt; Resources</td>
<td>0.159*</td>
<td>2.125</td>
<td>.034</td>
<td><strong>0.173</strong>*</td>
<td>2.292</td>
</tr>
<tr>
<td><strong>External Strategies</strong> -&gt; Impacts</td>
<td>0.127</td>
<td>1.555</td>
<td>.120</td>
<td><strong>0.173</strong>*</td>
<td>2.292</td>
</tr>
<tr>
<td><strong>Internal Strategies</strong> -&gt; Network Communication</td>
<td>0.189**</td>
<td>2.830</td>
<td>.004</td>
<td><strong>0.276</strong>*</td>
<td>3.768</td>
</tr>
<tr>
<td><strong>Internal Strategies</strong> -&gt; Resources</td>
<td>0.053</td>
<td>1.035</td>
<td>.301</td>
<td><strong>0.156</strong>*</td>
<td>2.257</td>
</tr>
<tr>
<td><strong>Internal Strategies</strong> -&gt; Impacts</td>
<td>0.276***</td>
<td>3.768</td>
<td>&lt; .001</td>
<td><strong>0.292</strong>*</td>
<td>3.932</td>
</tr>
<tr>
<td><strong>Network Communication</strong> -&gt; Resources</td>
<td>0.546***</td>
<td>6.499</td>
<td>&lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Network Communication</strong> -&gt; Impacts</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.055</td>
<td>1.268</td>
</tr>
<tr>
<td><strong>Resources</strong> -&gt; Impacts</td>
<td>0.101</td>
<td>1.495</td>
<td>.136</td>
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</tr>
<tr>
<td><strong>Group Age</strong> -&gt; Impacts</td>
<td>0.168*</td>
<td>2.306</td>
<td>.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group Size</strong> -&gt; Impacts</td>
<td>-0.073</td>
<td>1.225</td>
<td>.221</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meeting Frequency</strong> -&gt; Impacts</td>
<td>0.122*</td>
<td>2.439</td>
<td>.015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. R² of impacts = .234; R² of network communication = .428, R² of resource acquisition = .470.

*a Group age was estimated to be a suppressor variable because it enhanced the effect of group size on impacts. That also explains why the group size-outcome link had opposite signs of the simple correlation and path coefficient.

*p < .05, **p < .01, ***p < .001*
Figure 6-1. The resulting model via PLS analysis. Note that the path coefficients displayed are standardized.

† p < .10, * p < .05, ** p < .01, *** p < .001
To further determine the significance of the indirect effects, bootstrapping simple mediation was used with 5,000 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. Results showed that the indirect effects of both types of strategies on resources through network communication were significant because zero was not contained in the intervals (see Table 6-5(a)). As a result, it can be concluded that the total effect of external strategies on resource acquisition was ascribed to both direct and indirect effects; in contrast, the total effect of internal strategies on resources was mainly attributed to the indirect effect.

Nonetheless, as displayed in Table 6-5(b), the total indirect effects of strategies on group impacts were not significant. A further examination showed that the indirect effects through these mediating variables (network communication and resource acquisition) did not differ from each other significantly because zero was contained in the intervals (see Table 6-5(b) for the results in the row labeled “network communication*resources vs. resources”). 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 to indirect effects, even though they were insignificant.

**PLS Multi-Group Analysis**

To answer RQ5 about the influence of the degree of mixed modality in organizing and generating the impacts of mixed-mode groups, a multi-group analysis (PLS-MGA)
Table 6-5(a)

*Bootstrapping Indirect Effects of Strategies on Resource Acquisition through Network Communication*

<table>
<thead>
<tr>
<th>DV: Resources</th>
<th>BC 95% CI</th>
<th>BCa95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Point estimate</td>
<td>Lower</td>
</tr>
<tr>
<td>Network Communication (&lt;-external strategies)*</td>
<td>.1103</td>
<td>.0711</td>
</tr>
<tr>
<td>Network Communication (&lt;-internal strategies)*</td>
<td>.0474</td>
<td>.0140</td>
</tr>
</tbody>
</table>

*Note.* BC, bias corrected; BCa, bias corrected and accelerated; 5,000 bootstrap samples.

*With internal strategies entered as the control variable.

Table 6-5(b)

*Bootstrapping Indirect Effects of Strategies on Impacts through Resource Acquisition and Network Communication*

<table>
<thead>
<tr>
<th></th>
<th>BC 95% CI</th>
<th>BCa95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Point estimate</td>
<td>Lower</td>
</tr>
<tr>
<td>Network Communication*Resources (&lt;-external strategies)</td>
<td>-.0123</td>
<td>-.0595</td>
</tr>
<tr>
<td>Resources (&lt;- external strategies)</td>
<td>.0235</td>
<td>-.0150</td>
</tr>
<tr>
<td>Total*</td>
<td>.0112</td>
<td>-.0097</td>
</tr>
<tr>
<td>Network Communication*Resources vs. Resources</td>
<td>-.0359</td>
<td>-.1278</td>
</tr>
<tr>
<td>Network Communication*Resources (&lt;- internal strategies)</td>
<td>-.0041</td>
<td>-.0328</td>
</tr>
<tr>
<td>Resources (&lt;- internal strategies)</td>
<td>.0084</td>
<td>-.0040</td>
</tr>
<tr>
<td>Total*</td>
<td>.0044</td>
<td>-.0035</td>
</tr>
<tr>
<td>Network Communication*Resources vs. Resources</td>
<td>-.0125</td>
<td>-.0692</td>
</tr>
</tbody>
</table>

*Note.* BC, bias corrected; BCa, bias corrected and accelerated; 5,000 bootstrap samples.

*With internal strategies, group age, group size and meeting frequency entered as the control variables. *With external strategies, group age, group size and meeting frequency entered as the control variables.
was conducted using the variable of mixed modality, where code 1= groups using Meetup.com and other ways for group organizing (high mixed-mode subsample) and 2 = groups using only Meetup.com (low mixed-mode subsample). In Smart PLS, multi-group analysis is performed by splitting the sample into subsamples on the basis of the values of the variable and running the model on different subsamples (Eberl, 2010; Henseler et al., 2009; Sosik et al., 2009). But before looking at the differences in the path estimators between the two subsamples, assuring whether the two subsamples have acceptable model fit and measurement invariance is necessary (Eberl, 2010).

First, the results showed that the overall model fit in the two subsamples performed well, but the one in the high mixed-mode subsample appeared to work better in terms of different criteria (i.e., composite reliability, AVE, R², F test, Gof ) (see Table 6-6). Second, the distribution-free significance test (Henseler et al., 2009) was used to test the measurement invariance, which verifies that the loadings of the latent variables should not differ significantly within the model. Results showed that none of the loadings in the two subsamples differed significantly (see Table 6-7). As a result, the comparison of parameter estimation between subsamples can be made in the next step.

The two subsamples exhibited different patterns for predicting group impacts (see Table 6-8 and Figure 6-2(a) and 6-2(b)). Note that considering the relatively small sample size, a relaxed significance level of .10 was used in the multi-group analysis. In the high mixed-mode subsample (n = 84), group age and membership size significantly predicted group impacts while in the low mixed-mode subsample (n = 82), the influence of meeting frequency on group impacts was significant. Moreover, with regard to the hypotheses, the positive influence of internal and external strategies on network
Table 6-6

*PLS Multi-Group Analysis*

<table>
<thead>
<tr>
<th>Table 6-6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLS Multi-Group Analysis</strong></td>
</tr>
<tr>
<td><strong>Measurement Model</strong></td>
</tr>
<tr>
<td>AVE</td>
</tr>
<tr>
<td><strong>High Mixed-Mode Subsample</strong></td>
</tr>
<tr>
<td>Impacts</td>
</tr>
<tr>
<td>Network Communication</td>
</tr>
<tr>
<td>Resources</td>
</tr>
<tr>
<td><strong>Low Mixed-Mode Subsample</strong></td>
</tr>
<tr>
<td>Impacts</td>
</tr>
<tr>
<td>Network Communication</td>
</tr>
<tr>
<td>Resources</td>
</tr>
</tbody>
</table>

communication was significant in both subsamples. Both subsamples also displayed significant total effects of internal and external strategies on group impacts. Interestingly, network communication was significantly related to group impacts through resource acquisition in the high mixed-mode subsample, but not in its low mixed-mode counterpart. Yet the indirect effect was insignificant because zero was contained in the intervals, with a point estimate of .1411 and a 95% BCa bootstrap CI of -0.0144 and 0.3555.

Significance tests of the indirect effects revealed specific patterns of using strategies across subsamples. In both subsamples, the relationship between strategies and resource acquisition was mediated by network communication, yet with varying results. In the high mixed-mode subsample, external strategies had significant total effects on resource acquisition, which was contributed by both direct and indirect effects through...
network communication (see Table 6-9(a)). That implies that investing in external strategies helped the high mixed-mode groups to acquire resources, which might be directly or indirectly received from their network contacts. In the low mixed-mode subsample, however, only external strategies’ indirect effects on resource acquisition through network communication were significant. That means, for the low mixed-mode groups, when implementing strategies, they would need to take an extra step to build or maintain frequent network communication in order to get useful resources.

Table 6-7

*Test of Measurement Invariance between Subsamples*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Error Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC1 &lt; Network Communication</td>
<td>( p = .521 )</td>
</tr>
<tr>
<td>NC2 &lt; Network Communication</td>
<td>( p = .415 )</td>
</tr>
<tr>
<td>NC3 &lt; Network Communication</td>
<td>( p = .678 )</td>
</tr>
<tr>
<td>NC4 &lt; Network Communication</td>
<td>( p = .358 )</td>
</tr>
<tr>
<td>NC5 &lt; Network Communication</td>
<td>( p = .480 )</td>
</tr>
<tr>
<td>NC6 &lt; Network Communication</td>
<td>( p = .078 )</td>
</tr>
<tr>
<td>DeR &lt; Density of Resources</td>
<td>( p = .616 )</td>
</tr>
<tr>
<td>DiR &lt; Density of Resources</td>
<td>( p = .730 )</td>
</tr>
<tr>
<td>OC1 &lt; Impacts</td>
<td>( P = .372 )</td>
</tr>
<tr>
<td>OC2 &lt; Impacts</td>
<td>( p = .280 )</td>
</tr>
<tr>
<td>OC3 &lt; Impacts</td>
<td>( p = .317 )</td>
</tr>
<tr>
<td>OC4 &lt; Impacts</td>
<td>( p = .475 )</td>
</tr>
<tr>
<td>OC5 &lt; Impacts</td>
<td>( p = .448 )</td>
</tr>
<tr>
<td>OC6 &lt; Impacts</td>
<td>( p = .415 )</td>
</tr>
</tbody>
</table>

*Note.* The difference in a parameter between subsamples is significant when the \( p \) value is less than .05 or larger than .95. Non-significant \( p \) values indicate the measurement models in two subsamples are equivalent.
In both subsamples, significant total effects of strategies on group impacts were observed. In the high mixed-mode subsample, the total effects of internal strategies on group impacts relied on the substantial direct effect; those of external strategies on group impacts came from significant indirect effects through network communication and resources (see Table 6-9(b)). That means the high mixed-mode groups may have different options when using external and internal strategies, which would ultimately lead to the generation of group impacts. Specifically, network support can play a critical and helpful role when groups engage in external strategies with the aim of achieving group impacts. On the contrary, in the low mixed-mode subsample, both internal and external strategies had significant direct effects on group impacts. Therefore, it was not surprising to find insignificant indirect effects of both strategies on group impacts, either through network communication or resource acquisition. In short, use of both strategies was relatively useful and important in terms of helping the low mixed-mode groups to achieve group impacts.

Despite these aforementioned differences, significance tests showed that, except for the effects of group age and meeting frequency on group impacts, all the differences in path estimators between two subsamples were not statistically significant (see Table 6-8). For the most part, this suggests the strength of the influence between variables involved in the model can be generalized to two subsamples (Eberl, 2010). But based on the remaining significant differences, it was observed that the effect of group age on group impacts was greater in the high mixed-mode subsample than in the low mixed-mode subsample. Moreover, meeting frequency was important to group impacts in the low mixed-mode subsample, compared with the high mixed-mode subsample. Together,
Table 6-8

Comparisons of Parameter Estimates between Subsamples

<table>
<thead>
<tr>
<th>Path Coefficients (standardized)</th>
<th>T-value</th>
<th>Total Effect</th>
<th>T-value</th>
<th>Path Coefficients (standardized)</th>
<th>T-value</th>
<th>Total Effect</th>
<th>T-value</th>
<th>Error Probability (direct effects)</th>
<th>Error Probability (total effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Strategies</strong> -&gt; <strong>Network Communication</strong></td>
<td>0.568***</td>
<td>7.821</td>
<td>0.508***</td>
<td>4.898</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External Strategies</strong> -&gt; <strong>Resources</strong></td>
<td>0.247*</td>
<td>2.357</td>
<td>0.570***</td>
<td>6.523</td>
<td>0.065</td>
<td>0.829</td>
<td>0.332**</td>
<td>2.74</td>
<td></td>
</tr>
<tr>
<td><strong>External Strategies</strong> -&gt; <strong>Impacts</strong></td>
<td>0.024</td>
<td>0.256</td>
<td>0.176†</td>
<td>1.686</td>
<td>0.168†</td>
<td>1.841</td>
<td>0.178†</td>
<td>1.760</td>
<td></td>
</tr>
<tr>
<td><strong>Internal Strategies</strong> -&gt; <strong>Network Communication</strong></td>
<td>0.187*</td>
<td>2.309</td>
<td>0.193†</td>
<td>1.796</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internal Strategies</strong> -&gt; <strong>Resources</strong></td>
<td>-0.007</td>
<td>0.119</td>
<td>0.099</td>
<td>1.087</td>
<td>0.107</td>
<td>1.295</td>
<td>0.208†</td>
<td>1.804</td>
<td></td>
</tr>
<tr>
<td><strong>Internal Strategies</strong> -&gt; <strong>Impacts</strong></td>
<td>0.362***</td>
<td>3.403</td>
<td>0.388***</td>
<td>3.589</td>
<td>0.228*</td>
<td>2.018</td>
<td>0.234†</td>
<td>2.128</td>
<td></td>
</tr>
<tr>
<td><strong>Network Communication</strong> -&gt; <strong>Resources</strong></td>
<td>0.567***</td>
<td>5.087</td>
<td>0.526***</td>
<td>3.989</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Network Communication</strong> -&gt; <strong>Impacts</strong></td>
<td>0.151†</td>
<td>1.780</td>
<td>0.017</td>
<td>0.264</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resources</strong> -&gt; <strong>Impacts</strong></td>
<td>0.266*</td>
<td>1.941</td>
<td>.032</td>
<td>0.443</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group Age</strong> -&gt; <strong>Impacts</strong></td>
<td>0.320***</td>
<td>2.798</td>
<td>0.076</td>
<td>0.933</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The difference in a parameter between subsamples is significant when the error probability (p value) is less than .05 or larger than .95. This PLS-MGA approach does not require distributional assumptions; subsamples to be compared are undergoing separate bootstrap analyses, and the bootstrap outcomes are used as the basis for the hypothesis testing of group differences (Henseler et al., 2009).

In the high mixed-mode subsample, group age was estimated to be a suppressor variable because it enhanced the effect of group size on impacts. That also explains why the group size-impacts link had opposite signs of the simple correlation and path coefficient.

\[ p < .10, \ast p < .05, \ast\ast p < .01, \ast\ast\ast p < .001 \]

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \rightarrow ) Impacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.208</td>
<td>2.137</td>
<td>-0.067</td>
<td>0.655</td>
<td>( p = .838 )</td>
</tr>
<tr>
<td>Meeting Frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \rightarrow ) Impacts</td>
<td>-0.052</td>
<td>0.919</td>
<td>0.285 ( \ast\ast\ast )</td>
<td>4.415</td>
<td>( p = 1 )</td>
</tr>
</tbody>
</table>

**Note.** The difference in a parameter between subsamples is significant when the error probability (p value) is less than .05 or larger than .95. This PLS-MGA approach does not require distributional assumptions; subsamples to be compared are undergoing separate bootstrap analyses, and the bootstrap outcomes are used as the basis for the hypothesis testing of group differences (Henseler et al., 2009).

* \( n = 84 \) in the high mixed-mode subsample; \( n = 82 \) in the low mixed-mode subsample.

†In the high mixed-mode subsample, group age was estimated to be a suppressor variable because it enhanced the effect of group size on impacts. That also explains why the group size-impacts link had opposite signs of the simple correlation and path coefficient.

\[ p < .10, \ast p < .05, \ast\ast p < .01, \ast\ast\ast p < .001 \]
Figure 6-2(a). The resulting model for the high mixed-mode subsample.
Figure 6-2(b). The resulting model for the low mixed-mode subsample.

\[ p < .10, \quad \ast p < .05, \quad \ast\ast p < .01, \quad \ast\ast\ast p < .001 \]
Table 6-9(a) Bootstrapping Indirect Effects of Strategies on Resource Acquisition through Network Communication

<table>
<thead>
<tr>
<th>DV: Resources</th>
<th>High Mixed-Mode Subsample</th>
<th>Low Mixed-Mode Subsample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Point estimate</td>
<td>BC 95% CI</td>
</tr>
<tr>
<td>Network Communication (&lt;- external</td>
<td>.1268</td>
<td>.0616</td>
</tr>
<tr>
<td>strategies)a</td>
<td></td>
<td>.0659</td>
</tr>
<tr>
<td>Network communication (&lt;- internal</td>
<td>.0463</td>
<td>.0104</td>
</tr>
<tr>
<td>strategies)b</td>
<td></td>
<td>.0105</td>
</tr>
</tbody>
</table>

Note. BC, bias corrected; BCa, bias corrected and accelerated; 5,000 bootstrap samples.
aWith internal strategies entered as the control variable. bWith external strategies entered as the control variable.
**Table 6-9(b)**

*Bootstrapping Indirect Effects of Strategies on Impacts through Resource Acquisition and Network Communication*

<table>
<thead>
<tr>
<th>High Mixed-Mode Subsample</th>
<th>Low Mixed-Mode Subsample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Point estimate</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Communication*Resources (&lt;- external strategies)</td>
<td>-.0190</td>
</tr>
<tr>
<td>Resources (&lt;- external strategies)</td>
<td>.0586</td>
</tr>
<tr>
<td>Total*</td>
<td><strong>.0396</strong></td>
</tr>
<tr>
<td>Network Communication*Resources Vs. Resources</td>
<td>-.0777</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High Mixed-Mode Subsample</th>
<th>Low Mixed-Mode Subsample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Point estimate</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Communication*Resources (&lt;- internal strategies)</td>
<td>-.0028</td>
</tr>
<tr>
<td>Resources (&lt;- internal strategies)</td>
<td>.0088</td>
</tr>
<tr>
<td>Total*</td>
<td><strong>.0060</strong></td>
</tr>
<tr>
<td>Network Communication*Resources Vs. Resources</td>
<td>-.0117</td>
</tr>
</tbody>
</table>

*Note.* BC, bias corrected; BCa, bias corrected and accelerated; 5,000 bootstrap sample.

*With internal strategies, group age, group size and meeting frequency entered as the control variables.*

*With external strategies, group age, group size and meeting frequency entered as the control variables.*
it implies that, when it comes to generating group impacts, the low mixed-mode groups relied on face-to-face meetings to do so, and among the high mixed-mode groups, group age was a greater factor in predicting impacts.

**Discussion**

The results revealed the importance of using strategies as well as engaging in external activities involving network contacts to bring forth positive outcomes at the collective level. Both internal and external strategies had significant effects on network communication, which in turn affected resources obtained (diversity and density of resources from network contacts). Both types of strategies also had significant effects on group impacts; yet while internal strategies had direct effects on group impacts, external strategies had more circuitous and additive effects on group impacts. Additionally, group age and meeting frequency were found to be significantly related to perceived group impacts. Older groups and groups with more frequent face-to-face meetings were more likely to perceive positive group impacts achieved at the collective level.

The results from the multi-group analysis showed that network communication played a critical role in mediating the relationship between the use of strategies and receipt of resources across subsamples. But a main difference was that the high mixed-mode group had the advantage of using external strategies to acquire resources for group operation, which may be directly or indirectly received from network contacts. Hence, the importance of internal strategies should be less emphasized for this set of groups. For the low mixed-mode groups, using external strategies, coupled with more frequent communication with network contacts, would be an effective way to get resources. In
terms of the effect of strategies on group impacts, the high mixed-mode groups had the flexibility of either solely implementing internal strategies to achieve such effects, or relying on external strategies and getting resources via network contacts to do so. In contrast, in the low mixed-mode subsample, focusing more on the strategies alone would help accomplish the desired outcomes.

On the basis of these findings, this study (Part III) has made three theoretical and conceptual contributions by 1) applying a boundary spanning framework to explain and understand the group-environment relationships played out in mixed-mode groups, an emerging social phenomenon of voluntary associations that has received little empirical research thus far; 2) examining the role of varying degrees of mixed modality in organizing groups and producing impacts, which helps enrich the ecological and evolutionary perspective; and 3) investigating the impacts of mixed-mode groups, which helps extend existing research on social capital placed in traditional voluntary associations as well as technology-mediated communication contexts.

**Relationships between Mixed-Mode Groups and the Environment**

This study extends the group boundary spanning literature to voluntary associations, in particular to the mixed-mode group context. Meetup groups, being embedded in their hosting environment of Meetup.com as well as other larger resource environments, tend to have amorphous and porous boundaries that facilitate interaction within and across groups. Groups were observed to engage in external communication with individuals and organizations outside Meetup.com, which helped them to acquire resources necessary for group operation. Unlike task groups, work organizations, or formal non-profit organizations, which are the dominant targets of study under boundary
spanning and organizational ecological research, mixed-mode groups resemble a type of association that may not be defined as small group or organization. In response to Knoke and Prensky’s (1984) questioning of the applicability of contemporary organization theories to voluntary associations, this study provides empirical evidence demonstrating the usefulness of employing an ecological and boundary spanning view in explaining and understanding voluntary associations in general and mixed-mode groups in particular.

In this study, resource acquisition was measured by resources received from members, other Meetup groups, and organizations outside Meetup.com. This has two implications. First, within the population of Meetup.com -- consisting of tens of thousands of groups -- members are likely to belong to multiple groups. Echoing previous research (Ancona & Caldwell, 1988), this condition of multiple affiliations is conducive to boundary spanning, which may also explain its beneficial effects on the Meetup groups under study. Second, due to technical difficulties, survey respondents were only asked about the general resources they received from contacts, without further details retrieved concerning the specific content and type of resources involved. Yet, network links provisioned with different resources have been found to influence each other and together determine the evolution of organizational communities (Lee & Monge, 2011). Hence, future research should look for more details of network communication and resource acquisition to better understand how mixed-mode groups interact with their environments.

Meanwhile, this inadequacy of measurement for network communication and resource acquisition may help explain the result of a non-significant relationship between resource acquisitions and group impacts. One possible conjecture is that, instead of an
aggregate set of resources, certain resources weigh more than others in leading to group impacts. This result may also be attributable to the different levels of mixed-mode organizing. Multi-group analysis showed that focusing on strategies, rather than on network resources, can help the low mixed-mode subsample to effectively generate impacts internally and externally. Put differently, the importance of resource acquisition may vary depending on the level of multimodality. Through diverse modes of organizing, a group is likely to tap into different generators of resources from its environment, and achieve desired outcomes accordingly.

Incorporating both internal and external dimensions of strategic variations and group outcomes, this study also contributes to the existing research on intraorganizational and organizational ecology and evolution. The results identified the influence of internal and external strategies on resource acquisition and group impacts. Descriptive analysis revealed that the most popular internal strategies used by groups were regular events, followed by diversity of locations, diversity of activity, and focused topics (see Table 6-10 and Appendix C). Externally, groups tended to pay attention to their interaction with local venues, incorporate their activity as part of local events, and cross-post events by other Meetup or non-Meetup groups. Applying the concept of internal evolution (Miner, 1994) and co-evolution (Baum & Singh, 1994b), organizers can be said to play an important role in deciding which strategies to act on, choose, and retain as part of a group’s routine practices. Building on these strategic choices, organizers can further adjust groups’ relationships with other Meetup and non-Meetup groups and organizations, which in turn results in the co-evolution of groups and the external environments by producing impacts.
Implications of Mixed-Mode Organizing

Under the ecological and evolutionary view, a group of organizations having the same organizational form means that they share a common set of characteristics that distinguish them from another group of organizations, and together they constitute an organizational population (McKelvey, 1982; Monge & Contractor, 2003; Monge et al., 2008). In this vein, it can be said that mixed-mode organizing is a defining characteristic of mixed-mode groups. Meetup.com, the research site of this study, is viewed as a big population consisting of numerous Meetup groups, which share a common feature of mixed-mode organizing despite the varying degrees of multimodality.

The results from the multi-group analysis suggest that the low mixed-mode groups tended to focus on strategies to result in outcomes, while the high mixed-mode groups more actively engaged in the use of strategies in conjunction with external communication and resource acquisition. Statistically speaking, meeting frequency differentiated the low and high mixed-mode subsamples, indicating that the former relied on face-to-face meetings to generate impacts. Hence, it is a reasonable speculation that the high mixed-mode groups are likely to have ongoing impacts even if they migrate to other platforms for organizing, because they are more resourceful. Actually, differential effects of strategies are hinted at in the descriptive analysis as shown in Table 6-10. It appears that the high mixed-mode groups favored technology use while their low mixed-mode counterparts relied on member involvement. Externally, the engagement of other non-Meetup groups and organizations was especially salient to the high mixed-mode subsample, rather than to the low mixed-mode cluster. It thus stands to reason that multimodal organizing represents a potential capacity that groups can build and
### Table 6-10

**Strategies Used by Meetup Groups**

<table>
<thead>
<tr>
<th></th>
<th>The Total 171 Groups</th>
<th>High Mixed-Mode Groups</th>
<th>Low Mixed-Mode Groups</th>
<th>Significance Test of Difference between Subsamples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Group Policy</td>
<td>2.92</td>
<td>1.69</td>
<td>2.78</td>
<td>1.65</td>
</tr>
<tr>
<td>Requiring Member Dues</td>
<td>1.69</td>
<td>1.41</td>
<td>1.70</td>
<td>1.39</td>
</tr>
<tr>
<td><strong>Member Involvement</strong></td>
<td>2.99</td>
<td>1.24</td>
<td><strong>2.66</strong></td>
<td><strong>1.30</strong></td>
</tr>
<tr>
<td>Diversity of Activity</td>
<td>3.12</td>
<td>1.38</td>
<td>3.03</td>
<td>1.42</td>
</tr>
<tr>
<td><strong>Creation of Subgroups</strong></td>
<td>1.44</td>
<td>0.94</td>
<td><strong>1.61</strong></td>
<td><strong>1.09</strong></td>
</tr>
<tr>
<td>Private Events</td>
<td>2.10</td>
<td>1.29</td>
<td>2.20</td>
<td>1.34</td>
</tr>
<tr>
<td>Focused Topics</td>
<td>3.08</td>
<td>1.70</td>
<td>3.26</td>
<td>1.65</td>
</tr>
<tr>
<td><strong>Technology Use</strong></td>
<td>2.51</td>
<td>1.54</td>
<td><strong>3.00</strong></td>
<td><strong>1.58</strong></td>
</tr>
<tr>
<td>Diversity of Locations</td>
<td>3.34</td>
<td>1.51</td>
<td>3.29</td>
<td>1.57</td>
</tr>
<tr>
<td><strong>Regular Events</strong></td>
<td>3.65</td>
<td>1.58</td>
<td><strong>4.01</strong></td>
<td><strong>1.44</strong></td>
</tr>
<tr>
<td>Copy Other Meetup Groups</td>
<td>1.82</td>
<td>1.08</td>
<td>1.83</td>
<td>0.99</td>
</tr>
<tr>
<td><strong>Copy Other Non-Meetup Groups</strong></td>
<td>1.70</td>
<td>1.08</td>
<td><strong>1.88</strong></td>
<td><strong>1.17</strong></td>
</tr>
<tr>
<td>Cross-post Events by Other Meetup Groups</td>
<td>2.07</td>
<td>1.24</td>
<td>2.15</td>
<td>1.28</td>
</tr>
<tr>
<td>Joint Events with Other Meetup Groups</td>
<td>1.93</td>
<td>1.20</td>
<td>2.04</td>
<td>1.19</td>
</tr>
<tr>
<td><strong>Cross-post Events by Other Non-Meetup Groups/Organizations</strong></td>
<td>2.05</td>
<td>1.22</td>
<td><strong>2.31</strong></td>
<td><strong>1.33</strong></td>
</tr>
<tr>
<td>Joint Events with Other Non-Meetup Groups/Organizations</td>
<td>1.99</td>
<td>1.22</td>
<td><strong>2.30</strong></td>
<td><strong>1.33</strong></td>
</tr>
<tr>
<td>Activity as Part of Local Events</td>
<td>2.29</td>
<td>1.34</td>
<td>2.35</td>
<td>1.38</td>
</tr>
<tr>
<td>Interaction with Local Venues</td>
<td>2.70</td>
<td>1.63</td>
<td>2.94</td>
<td>1.67</td>
</tr>
</tbody>
</table>

Scale 1-5: 1 = Never, 2 = Once, 3 = A few times, 4 = Many times, 5 = Regularly
strengthen through technology use. In evolutionary terms, mixed-mode organizing is a source of variation that groups can adapt and decide whether to select and retain as part of organizing routines.

Findings of this study also help broaden the context in which the pattern of mode-switching occurs, from existing research concentrated in virtual teams and online groups to the mixed-mode group context. In discussing the predominant Internet and CMC research, Parks (2009) suggests that, instead of simply focusing on the surface feature of the Internet or the dramatic mode switch from online to offline, more research attention should be directed toward situating the phenomena within the broader context of communication theory. Multimodalities have gradually become the norm, depicting the way individuals and groups interact with one another (Baym, 2009). It is thus argued that research should place more emphasis on understanding how individuals and groups conduct the relationships and build communities as technology use becomes embedded in different media and situated for different relationships and communicative purposes (Baym, 2009).

Indeed, as Kavanaugh et al.’s (2005) study showed, over time, local social groups had increased use of multimode communication enabled through different technologies, and members became more active accordingly. Unfortunately, in this study, the measurements of external communication and resource acquisition did not differentiate face-to-face and electronic means. Moreover, a dichotomized measure (Meetup-only or not) used in this study did not allow for more nuanced analysis as to the degree of multimodal communication and the resulting impacts. But with the growing importance
of mixed-mode organizing and mixed-mode groups, this topic certainly merits further research.

**Impacts of Mixed-Mode Groups and Social Capital**

As a contemporary and technology-mediated form of voluntary associations, mixed-mode groups fulfill ongoing pluralistic needs and interests in human society. Unlike traditional voluntary associations, mixed-mode groups have the characteristics of a relatively low threshold for initiating and participating in associational activities, and the flexibility of organizing and interacting in a multimodal way. This study investigates the impacts of mixed-mode groups, bridging two areas of research that have contributed to the topic of the social benefits of associational activities. In the traditional voluntary associations and civil society area, voluntary associations have long been associated with various forms of social benefits realized through face-to-face interaction, ranging from cultivating democratic and civic attitudes and behavior, encouraging active political participation, to facilitating learning of cooperative attitudes and behaviors (interpersonal trust) (e.g., Fung, 2003; Kwak, Shan, & Holbert, 2004; Newton, 1997; Putnam, 1993, 2000; Rogers et al., 1975; Stolle, 2000; Wollebaek & Selle, 2002; Woolcock, 1998).

Meanwhile, researchers working on the social implications of the Internet have probed the possibility of associational activity enabled through technology-mediated interaction and have provided ample evidence of the acquisition of social capital as a result of Internet use (e.g., Ellison, Steinfield, & Lampe, 2007; Shah, Kwak, & Holbert, 2001; Skoric, Ying, & Ng, 2009; Wellman et al., 2001).

Despite its exploratory nature, this study makes a first attempt to examine the impacts of Internet-established voluntary associations at the collective level. Consistent
with the literature on voluntary associations, this study demonstrates that groups having frequent face-to-face meetings, greater longevity, and investing in internal strategies are likely to generate positive outcomes (Andrews et al., 2010; Smith, 2000). In response to the call for research on voluntary associations and social capital (Newton, 1997; Smith, 1997), this study demonstrates the fact that mixed-mode groups can create lasting local ties among members and nonmembers, who would otherwise be unlinked, that is, producing both internal and external impacts. Moreover, this study identifies the usefulness of tapping into communication networks outside the group for obtaining resources, which goes to the heart of the argument about voluntary associations leading to social integration and social capital. That is, on an aggregate level, mixed-mode groups are connected to other groups and organizations, which constitute an interlocking horizontal network that is likely to foster coordinated action (Putnam, 2000).

This study also enriches existing Internet research by considering the context in which social capital is generated. Existing research tends to concentrate on whether and how communication and social relationships mediated through technology can help generate positive relational and participatory outcomes (i.e., social capital) (Wellman et al., 2001). Applying an ecological and evolutionary perspective helps provide theoretical reasons to explain the importance 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 group strategy for securing resources. It thus makes theoretical sense to conclude that the Internet has become incorporated in mixed-mode groups’ routine practices of organizing, and social capital is naturally activated in these efforts.
Conclusion

Employing an ecological and evolutionary perspective, this chapter examines the dynamics of mixed-mode groups’ strategic actions in contributing to group impacts internally and externally. Findings of this study indicate the usefulness of strategies leading to resource acquisition and group impacts. Internal strategies had a direct effect on group impacts; but when implementing external strategies, groups would need to take an extra step to perform network communication and resource acquisition in order to generate group impacts. Mixed-mode organizing is conceptualized as a potential capacity that mixed-mode groups can build and strengthen, since the results of the multi-group analysis revealed the resourcefulness of the high mixed-mode groups in activating strategies as well as securing resources from outside, which in turn influenced the production of group impacts.

Limitations

There are several limitations of this study (Part III). First, the small-to-moderate sample size led to the statistic choice of non-parametric PLS analysis, which resulted in a low $R^2$ of .234. It is highly likely the findings might be biased. These methodological limitations should be assessed bearing in mind the exploratory nature of this study; moreover, it is estimated that this study has laid the foundation for more refined analysis in future research. Second, the measurements of the variables used were mostly from interview data conducted in the previous stage of the research. It may be criticized as lacking established validity; yet the results of the measurement model indicate these measurements had acceptable reliability and validity. Doubtless, more efforts will be invested on integrating established scales in the next phase of research. Third, a cross-
sectional survey does not allow for causality claims. As mentioned in the method sections in Chapter 3, PLS analysis was chosen because it fits the exploratory and theory-building characteristics of this study. Needless to say, longitudinal design and next phase of confirmatory study would be required to address these concerns.

Despite these limitations, this study aims to make theoretical contributions by extending the boundary spanning framework to mixed-mode groups. It also enhances the literature on social capital and voluntary associations by broadening the context in which social capital is observed to be generated through both face-to-face and technology-mediated communication, that is, mixed-mode communication and organizing. Certainly, with the growth of mixed-mode groups and the consistent human urge to voluntarily participate in associational activities, this study makes a first attempt to explain and understand group evolution and impacts. Future research from other perspectives and disciplines could offer additional insights into the significance of technology-established voluntary associations in our contemporary society.
Notes

\[ F = \frac{[(R_2^2 - R_1^2)/(k_2 - k_1)]}{[(1-R_2^2)/(N - k_2 -1)]]} \Rightarrow \frac{[(0.234 - 0.107)/(7-3)]}{[(1-0.234)/171-7-1]} = 6.756, \text{ with } [(7-3),(171-7-1)] \text{ degrees of freedom.} \]

\[ R_2^2 \text{ is for the superset model that includes the set of main predictors and } R_1^2 \text{ is the baseline model. } K_2 \text{ is the number of predictors for the superset model and } K_1 \text{ is the number of predictors for the baseline model, and } N \text{ is the sample size. See Chin (1998, 2010).} \]

\[ \text{GoF} = \sqrt{\text{average}(\text{AVE}) \times \text{average}(R^2)} = \sqrt{0.613 \times 0.377} = 0.614 \text{ (Tenenhaus et al., 2005).} \]

\[ ^2 \text{ Despite the limitations, the proposed model was run with AMOS to ensure its validity. The results were comparable to those from the analysis with PLS (Smart PLS).} \]
Chapter 7
General Discussion: Ecology and Evolution of Mixed-Mode Groups

This chapter first summarizes the findings of this study conducted on Meetup groups, a popular example of mixed-mode groups, and then elaborates on the significance of these findings. Special attention is paid to the discussion of analytical, theoretical, practical, policy, and methodological contributions made by this study to the existing research. The delineations of these contributions are followed by identifying the analytical and methodological limitations. Future directions for research are illustrated on the basis of the findings and implications derived from this study.

Summary of the Findings

Given the nascent and complex nature of the research topic, this study fuses together concepts and theories from a wide range of disciplines and concentrations, including sociology, management, political science, and certainly, small group, organizational and computer-mediated communication (CMC). Using Meetup.com as the research site, this study analyzed the evolution and ecology of mixed-mode groups at group and population levels. Through interviews with 34 Meetup organizers, the iterative processes of variation-selection-retention (V-S-R) were revealed, manifested in the formation and continuity of Meetup groups. The consequences of growing and surviving groups were discussed, borrowing theories of collective action. Further, longitudinal analysis of 100 randomly selected Meetup groups showed the V-S-R processes taking place at the population level, which in turn helped identify the organizational forms that existed and which ones were selected and retained in the population. The interview data
provided insights into the evolutionary process on the part of the groups, while the longitudinal analysis of groups informed the structural factors affecting survival across groups. Consistent with existing research on organizational ecology and evolution, the results suggest that the most relevant predictors of group survival included: the ecological factor in the form of population density; demographic factors represented by group age, profit orientation, and leadership; and external links. All were critical in predicting the survival of the 100 Meetup groups being observed over 18 months. In other words, the evolutionary processes have led to the selection of older, not-for-profit groups, living under lower population density of other groups, and surviving with a leadership team and leadership change, in the population of Meetup groups. Those selected and surviving groups also tended to maintain external links with other groups within and/or outside the population of Meetup.com.

This study also addresses the impacts of mixed-mode groups. Analysis of the online survey with 171 Meetup group organizers yielded insights into the strategies used by groups, as well as the external activities involving network contacts in bringing forth positive outcomes at the collective level. Both internal and external strategies had significant effects on network communication, which in turn affected resources obtained (diversity and density of resources from network contacts). The former refer to those strategies focusing on internal group processes (e.g., group policy) while the latter are those involving external individuals or organizations (e.g., joint events). Both types of strategies also had significant effects on outcomes; yet while internal strategies had direct effects on group impacts, external strategies had more circuitous and additive effects on group impacts. Additionally, group age and meeting frequency were found to be
significantly related to perceived group impacts. Older groups and groups with more frequent face-to-face meetings were more likely to perceive positive group impacts achieved at the collective level.

In order to unravel the influence of varying degrees of mixed modality in the organization and operation of mixed-mode groups, a multi-group analysis was conducted. The results of this analysis showed that network communication played a critical role in mediating the relationship between strategies used and resources obtained by both high and low mixed-mode subsamples. But a main difference was that the high mixed-mode groups can invest in external strategies to acquire resources for group operation, which may be directly or indirectly received from network contacts. The importance of internal strategies was less significant in this regard for this set of groups. For the low mixed-mode groups, using external strategies, coupled with more frequent communication with network contacts, would be an effective way to get resources. In terms of using strategies to generate group impacts, the high mixed-mode groups had the flexibility of either solely implementing internal strategies to achieve such effects, or relying on external strategies and getting resources via network contacts to do so. In contrast, in the low mixed-mode subsample, focusing more on the use of different strategies alone would help accomplish the desired outcomes. These results together indicate that mixed-mode organizing is a capacity that can help groups to become embedded in the larger environment as well as achieve impacts, internally and externally.

As much as the findings of this study helped enrich the ecological and evolutionary perspective and other related lines of work, this series of studies also raises questions and issues that merit further research. This chapter aims to delineate different
contributions that this study makes analytically, theoretically, methodologically, and practically. After identifying the limitations, this chapter will conclude by suggesting the potential areas for the next step of study.

**Analytical Implications**

Analytically, this study makes contributions by applying an ecological and evolutionary perspective to understand Internet-established voluntary associations -- *mixed-mode groups*. So far, this perspective has been discussed and tested mostly on formal organizations. Other contributions include performing a multilevel analysis of mixed-mode groups and conceptualizing a nexus between the evolution of mixed-mode groups and technological affordances of multimodal organizing.

**An Ecological and Evolutionary Perspective of Mixed-Mode Groups**

Unlike task groups, work organizations, or formal non-profit organizations, which are the dominant targets of study under the organizational ecology and evolutionary perspective, mixed-mode groups resemble a type of association that cannot easily be defined as a small group or organization. In response to Knoke and Prensky’s (1984) questioning of the applicability of contemporary organization theories to voluntary associations, this study posits that an ecological and evolutionary perspective is an appropriate analytical framework to study voluntary associations, especially mixed-mode groups. In this study, in order to understand and explain different aspects of mixed-mode groups, a variety of approaches were called on (in close proximity with evolutionary theory), along with the employment of different methods of data collection and analysis.

Findings of this study further exemplify the usefulness of applying a synthetic ecological and evolutionary framework to understand and explain mixed-mode groups.
First, analysis of the interview data unveiled the evolutionary processes in the form of V-S-R mechanisms enacted by Meetup groups. Specifically, it was found that groups engaged in an iterative and simultaneous process of V-S-R as they evolved. Representing the management of organization-environment relationships rooted in population ecology and resource dependence theory, interview data also showed that group organizers engaged in managing their relationships with the environment in the form of cooperating with other Meetup groups and organizations, as well as interacting with local establishments and the community. Second, longitudinal analysis revealed the ecological and demographic factors that influenced the survival of Meetup groups, including population density, group age, profit orientation, leadership change, leadership structure, and external links. Third, results from the online survey indicate that Meetup groups, embedded in their hosting environment of Meetup.com as well as other larger resource environments, tended to have amorphous and porous boundaries that facilitated interaction within and across groups. Groups were also observed to engage in external communication with individuals and organizations outside Meetup.com, which helped them to acquire resources necessary for group operation.

Findings also pointed to the fact that organizers’ strategic and communicative actions are the essential mechanisms that guide group evolution and generate group impacts. Organizers were considered to play a critical role in deciding which strategies to act on, select, and retain as part of group routine practices, which were clearly manifested in the enactment of V-S-R processes and implementation of internal and external strategies as mentioned in Chapter 4, 5 and 6. Studies of leadership have long recognized the fact that leadership is a critical factor behind vital and viable
organizations. Effective leadership represents the capacity to translate intention into reality and sustain it (Bennis, 1989; Bennis & Nanus, 1985). In particular, organizers of these Meetup groups can be seen to take on dual role as manager and leader because they not only take charge of group operation but also guide the direction of the group.

“Managers are people who do things right and leaders are people who do the right thing” (Bennis & Nanus, 1985, p. 21). Moreover, in line with the concept of internal evolution (Miner, 1994), it can be said that organizers have the capacity and intention to manage strategic action for groups and that also includes adjusting their group’s relationship with other Meetup and non-Meetup groups and organizations. As a result, groups are able to produce perceivable impacts. Indisputably, communication initiated and maintained between organizers and members and between organizer and non-members is integral to the processes of internal organizing as well as external boundary work.

**Multilevel and Multidimensional Analysis of Mixed-Mode Groups**

The advantage of the ecological and evolutionary perspective lies in its ability to explain phenomena using the same theoretical process at different levels (Monge et al., 2008). Further, using mixed methods allows for a more comprehensive analysis of group evolution (Selle & Øymyr, 1992). Echoing these assertions, this study relied on interviews with Meetup group organizers to identify the evolutionary processes at the group level, and longitudinal analysis of randomly selected Meetup groups to illuminate the ecology and evolution at the population level. Follow-ups with these interviewed group organizers also added to the understanding of whether and how groups discontinued or continued operation elsewhere after they closed down their groups on Meetup.com, which in many cases brought to light the evolutionary process taking place
across populations. In evolutionary terms, while the occurrence of groups closing down on Meetup.com and migrating to Facebook is considered as a selection event at the group level, it reflects the adaptation and transformation at the higher level of populations (Monge et al., 2011b). In other words, it is a manifestation of a cross-level V-S-R process. It can be argued that Meetup.com carves out its macro-population niche, through sustained and closed groups, and co-exists with other free-of-charge populations of mixed-mode groups such as Facebook and BigTent in the larger environment.

In this respect, the V-S-R framework identified in this study (see Figure 4-1) helps illuminate a proven way to explain and predict human interaction taking place across different levels (micro-group and macro-population). For example, when groups move to Facebook from Meetup.com, they may engage in iterative and simultaneous V-S-R processes by handling new variations while modifying or dropping their existing selected and retained strategies. At the population level, both Meetup.com and Facebook also engage in these similar V-S-R processes by reacting to new sources of variation and adjusting their selected routines.

The multilevel analysis also allows for the investigation of V-S-R processes enacted within and outside the organization (Aldrich, 1999; Aldrich & Ruef, 2006; Monge et al., 2011a). Data from interviews and the online survey revealed a wide variety of strategies used by Meetup groups that encompassed different dimensions of group operation, including recruitment, logistics, leadership structure, activity type, and external activity. Results from archived analysis further confirmed the influence of internal leadership and external links on group survival. Taken together, such findings suggest Meetup groups’ investment in boundary work; groups manage to maintain group identity
while opening themselves to opportunities by interacting with external actors in the embedded environment (Ancona & Caldwell, 1988; Sundstrom et al., 1990; Yan & Louis, 1999). At the analytical level, these observations evidence the usefulness of applying an ecological and evolutionary perspective to derive a multidimensional understanding of mixed-mode groups, including groups’ internal V-S-R processes and their interaction with the environment.

**Technological Affordances and Mixed-Mode Organizing**

Through the investigation of mixed-mode groups, this study incorporates technological affordances of mixed-mode organizing into the conceptualizations of the ecological and evolutionary processes of groups. *Meetup* organizers being interviewed mentioned that they used a mixed approach of word-of-mouth and online search engines when trying to recruit members. Some organizers also used online platforms other than Meetup.com for coordination and communication. In Chapter 6, results from multi-group analysis suggest that group age and meeting frequency significantly differentiated the high and low mixed-mode subsamples: in the former, group longevity was positively associated with the generation of group impacts, while in the latter more face-to-face meetings were helpful for achieving the same group outcomes. Moreover, while the low mixed-mode groups tended to focus on strategies that resulted in group impacts, the high mixed-mode counterparts can be more resourceful through use of strategies, external communication, and resource acquisition in generating impacts.

The role of technology in the evolution of organizations has not received much attention as expected. Rice (1987) has made an early effort employing an ecological perspective to illustrate how communication technologies enhance the capacity and
adaptability of organizations and groups in decision-making, communication structure and even survival. Taking a step further, instead of viewing technologies as an environmental factor or an exterior object that influences group evolution and impacts, this study considers technological affordances as an inherent dimension of group evolution. Put simply, mixed-mode organizing can be seen as a source of variation that groups can adapt and decide whether to select and retain as part of organizing routines. In this way, mixed-mode organizing becomes a defining characteristic of mixed-mode groups, and Meetup.com can be thought of as a big population consisting of numerous Meetup groups, which share a common feature of mixed-mode organizing, despite their varying degrees of multimodality. This conceptualization is built on the notion of organizational form from the ecological and evolutionary perspective. Organizational form refers to a group of organizations sharing a common set of characteristics that distinguish them from another group of organizations; together they constitute an organizational population (McKelvey, 1982; Monge & Contractor, 2003; Monge et al., 2008).

An ecological and evolutionary perspective also allows for the investigation of organizing of mixed-mode groups across different contexts, which provides a solution to studying multimodal human behaviors. Few studies have looked into the influence of multimodality or mode-switching on sustaining group operation -- the studies by Sessions (2010) and Kavanaugh et al. (2005) are the exceptions. The former found that attending face-to-face meetings increased members’ engagement in the online community while the latter showed that member involvement in local social groups was enhanced as a result of increased face-to-face and online interaction. Invariably, researchers in the CMC area
have expressed their concerns about the lack of analytical frameworks and empirical studies to understand increasingly multimodal interactions at individual, group, and community levels (e.g., Baym, 2009; Parks, 2009; Walther & Parks, 2002; Walther, 2010). In addressing these concerns, this study presents an empirical solution of applying an ecological and evolutionary perspective to understand the organizing of associational activities across different media modalities.

**Theoretical Implications**

Applying an ecological and evolutionary perspective to understand the growth, decline, disbanding, and survival of mixed-mode groups, this study extends the existing ecological and evolutionary research concentrated in formal and task-oriented organizations to the domain of technology-mediated voluntary groups. The application of the ecological and evolutionary perspective also contributes to the existing research on voluntary associations, which has predominately focused on sociological conceptions in relation to survival and impacts of organizations. Moreover, by delving into the impacts of mixed-mode groups, findings of this study enrich the existing research on voluntary associations and social capital.

**Extension of Ecological and Evolutionary Theory**

The evolutionary approach has been recognized for its compatibility with other approaches, such as population ecology, resource dependence theory, and organizational learning, in explaining particular kinds of changes (Aldrich, 1999; Aldrich & Ruef, 2006). Echoing this argument, this study uses the ecological and evolutionary perspective as the overarching framework, supplemented by a series of theoretical and conceptual approaches to illuminate different aspects of mixed-mode groups. Specifically, focusing
on the under-researched area of intraorganizational ecology as well as the demography of organizations (Baum & Shipilov, 2006), findings of this study provided empirical contributions to ecology theory. Further, under the ecological and evolutionary perspective, V-S-R processes were found to be manifested through macro-structural features as well as micro-communicative processes. Such multilevel and multifaceted consideration of group organizing helped broaden the existing dominant sociological approach to voluntary associations.

Findings of this study demonstrated that while groups were surrounded and influenced by the existence of other groups within the population, groups were able to build and strengthen their fitness in different dimensions of group organizing. Groups were observed to rely on a combined approach of recruitment through word-of-mouth and online search engines, arrange focused or segmenting activities, cooperate with other groups/organizations, and interact with local establishments and community. Further, groups were able to explore their communication link and network fitness within and across groups, depending on activity scope and phase of group development. Interviews showed that communication links with other Meetup groups were preferred, and thus relatively fit for groups organizing diverse activities, but were less fit for groups arranging more focused topics. Similarly, links with local community organizations were likely to be sought and thus fit for a stable group, compared with a group still struggling with low turnout. As a consequence, implementation of these strategies was found to be beneficial for the generation of group impacts.

Nonetheless, these observed strategic actions do not mean that these Meetup groups were always aware of the alternatives that led to the initiation of planned
variations in response to their environments, as posited by the decision-making perspective on organizations that is chiefly represented by the resource dependence model (Aldrich & Pfeffer, 1976). In other words, groups operate under certain structural constraints, either from the environment or from the group itself. In Chapter 5, the results showed that leadership change positively influenced group survival, but the nature of leadership change varied. Interviews with organizers provided clarification on this issue: some groups were forced to pick a successor after the abrupt departure of the original organizer, whereas others had an a priori arrangement, resulting in an uninterrupted organizing structure. Likewise, groups’ external links, which were found to be critical to group survival, may not necessarily form out of the group’s request, but rather come unexpectedly (e.g., being contacted by another Meetup group or a local organization). These insights together illustrate the necessity of integrating various theoretical approaches, such as population ecology, resource dependence theory, and social embeddedness in identifying a dynamic view of evolution, capturing enabling and constraining forces for group operation.

**Impacts of Mixed-Mode Groups and Social Capital**

Considering the unique characteristics of mixed-mode groups that differentiate them from traditional voluntary associations and work groups, studying the impacts of mixed-mode groups has significance and merit. Unlike work and task-focused groups, mixed-mode groups, as a type of voluntary association, tend to have informal structure, diverse objectives, amateur leadership, and reliance on normative and affective incentives. Hence, existing theories about work group effectiveness (e.g., Gladstein, 1984; Hackman, 1987; Oh, Labianca, & Chung, 2006; Sundstrom et al., 1990) may not
be appropriate to apply to mixed-mode groups. Meanwhile, sharing many characteristics of traditional voluntary associations, mixed-mode groups tend to have “soft” output goals such as fulfillment of members’ demands for services or influencing public policies (Knoke & Prensky, 1984). Yet unlike traditional voluntary associations, in mixed-mode groups, there is a relatively low threshold for creating and participating in associational activities, and the flexibility of organizing and interacting within and across groups in multimodal ways. In light of this, existing research on effectiveness of voluntary associations (e.g., Andrews et al., 2010; Smith, 2000) may not adequately explain impacts of mixed-mode groups.

In filling the void left by extant research, this study contributes to the understanding of how mixed-mode groups engage in strategic actions as well as interact with their environments, which help achieve group outcomes in the form of internal and external impacts. Results suggest that, in addition to investing in internal strategies, groups could use their external network contacts to obtain resources, which ultimately affected the generation of group impacts. Such observations portray the realization of social capital, which is a well-researched topic in the area of Internet studies. There is a rich body of work attempting to seek explanations of whether and how the Internet can help individuals establish interpersonal relationships (network social capital) and stimulate participation in organizational activities (participatory capital) (Wellman et al., 2001). This study extends this line of work in two ways.

First, under an ecological and evolutionary perspective, communication networks and linkages can be theorized as mechanisms that groups and organizations invest in order to acquire resources (Monge et al., 2008). The management of networks and
linkages certainly comes with its costs, such as time and people to maintain the relationships. But the benefits of being in the relationships exceed the disadvantages of being excluded from the network (Monge et al., 2008). Therefore, as groups evolve, they will pursue link and network fitness, and social capital becomes a natural byproduct of groups’ evolutionary processes of pursuing fitness. Following this line of reasoning, this study provides theoretical reasons as to why and how Internet use facilitates the creation of social capital by invoking concepts from ecological and evolutionary theory. That is, social capital is an expected outcome from mixed-mode groups’ organizing practices involving external contacts. As the process of mixed-mode organizing requires, social capital is enabled through groups’ multimodal communication with external contacts, be they face-to-face or other electronic forms.

Second, focusing on communication affords the understanding of how communicative actions by individual members translate into the acquisition of social capital at the collective level. For example, Meetup group organizers were observed to engage in communication with other group organizers online, or with owners of local establishments in person, and groups would benefit from these connections initiated and maintained at the individual level. Making a contribution to the existing Internet studies on social capital, this study expands the research focus from individuals to collectives, highlighting a communication-centered view of social capital (Doerfel, Lai, & Chewning, 2010).

Practical Implications

The emphasis on environments in group evolution lends itself to understanding how groups implement internal and external strategies to acquire resources, which in turn
affects group survival and group outcomes. Findings of this study thus provided insight as to how to manage and organize sustainable groups, highlighting different useful strategies groups can use depending on the stage of group development. In most cases, the benefits of strategic action are accentuated with active leadership and efficient boundary work. Suggestions on how to collaborate with mixed-mode groups, based on the findings of this study, are also mentioned at the end of this section.

**Evolving Strategic Actions of Mixed-Mode Groups**

Accounts from *Meetup* group organizers revealed a wide array of strategies organizers have used, either internally or externally, to help group organizing. Groups were observed to experiment with different strategies in terms of recruiting members, organizing activities and interacting with entities outside of the group. Essentially, the trial-and-error process took place across different phases of group evolution. When a group moved into a stable phase, strategies selected and retained from the previous phase may be modified or even abandoned. For example, when a group got larger, organizers did not see a need to actively seek out members; instead, they can simply rely on online search engines to do the work for them. But later on, groups were faced with other challenges such as retaining members, seeking collaborative groups, or finding locations for group meetings. Another round of variation and selection was thus initiated. These results indicate that mixed-mode groups engage in the V-S-R processes simultaneously (Aldrich, 1999); they also show that these adaptive V-S-R processes can be iterative as groups evolve (Freeman, 1981). Hence, in managing a sustained mixed-mode group, it is advisable to have a flexible set of strategies that are subject to adjustments, since
different sources of variation and mechanisms of selection are activated as a group develops.

While having a set of strategies at hand is beneficial to maintaining a sustainable and impactful group, there are certainly variations among groups in terms of group goals. For example, a coffee lover group is less likely to see external impacts as the group goals tend to be focused on members’ experiences, whereas a community service group has the opposite intention of pursuing external impacts. Due to analytical limitations, this study did not differentiate mixed-mode groups by topics. Nonetheless, it is anticipated that placing priority on strategic action, despite the differences in the proportion of internal to external focus, should account for the sustainability and impacts of mixed-mode groups.

**Importance of Boundary Work and Leadership**

As part of group strategies, building and maintaining external links and networks is important. As mentioned in Chapter 4, while groups were often observed to be contacted by other groups or local organizations, there were certainly more cases in which organizers actively sought out potential sponsors, accommodative local venues, and other Meetup groups to cooperate with. In the relatively long-lived groups, in particular, at least the relationship with the local venue where group events were held was retained after these groups tried out different alternatives and finally settled on the selected one (Zajac & Olsen, 1993). Understandably, external links, as reported in the results from the longitudinal analysis in Chapter 5, were a critical factor in determining group survival. External communication with contacts outside the group was also key to resource acquisition and group impacts, as shown in the results from the online survey (in Chapter 6).
In addition to the importance of external links, findings from interviews, longitudinal analysis and the online survey all pointed to the fact that group organizers played a crucial role in the maintenance of group survival and generation of group impacts. First, interview data suggest that organizers decided which strategies to act on, choose, and retain as part of group routine practices. Second, the longitudinal analysis showed that a group with a leadership team and with an experience of leadership change was more likely to survive. Third, results from the online survey revealed that, building on internal and external strategic choices, 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 addressed 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, survival, and group impacts.

In sum, there are a number of suggestions for organizing and managing a sustainable mixed-mode group that can be derived from this research. First, multimodal strategies (i.e., different websites, both online and offline) are recommended for recruitment and advertising, as they can attract potential members not only from the social circles of the existing members but also those with more diverse social backgrounds and interests. Second, it is important to keep communication, both online and offline, open and dynamic between organizers and members and between members as it helps identify the types of event and location that are favored by members. Third,
the quality of group event is a deciding factor for retaining members; it is also useful to attract potential members. Invariably, many organizers interviewed have pointed out a critical principle: if there is a good event organized, people will come. Lastly, maintaining certain types of relationships with other 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 group discounts, sponsorships, and collaboration.

Fluid and porous boundaries between and among mixed-mode groups indicate that certain mechanisms of embedded networks are at work. From the perspective of potential collaborators with mixed-mode groups, including local establishments (e.g., restaurants, venues to hold events) and other organizations, they do not deal with a single group; instead, they place themselves in interrelated networks of mixed-mode groups. It has been shown that Meetup groups engaged in the constant trial-and-error process of initiating, transforming, and dissolving external ties. Groups can easily share with each other (both within and across populations) information and feedback about local establishments and organizations, be it positive or negative. For instance, a Meetup group may post positive (or negative) reviews about a restaurant where it holds events not only on its group page on Meetup.com but also on other social media websites such as Facebook and Twitter. Mixed-mode groups’ capacity of mixed-mode organizing to a large extent reflects their multimodal networking. Therefore, for those other organizations, a multimodal view of reputation building and management should be a factor to be reckoned with when seeking and maintaining collaboration with mixed-mode groups. That is, paying attention to both online and offline collaborative and cooperative
efforts and communication with mixed-mode groups is preferred over focusing exclusively on either domain.

**Policy Implications**

Inspired by the proposition about voluntary associations in facilitating social integration (e.g., Newton, 1997; Putnam, 1993, 2000; Smith, 2000; Tocqueville, 1968), this study tackles the issues of sustainability and impacts of mixed-mode groups. It has been posited that, in order to generate impacts, voluntary associations need to persist for at least one or more years so that their goals can be achieved gradually, which may affect members and/or nonmembers (Smith, 1997, 2000). In this vein, findings of this study not only help enrich existing research on sustainability and impacts of voluntary associations, but also help shed light on the potential of incorporating mixed-mode groups in policy consideration. Specifically, two major directions are posited as follows.

**Mixed-Mode Groups and Community Development**

Findings of this study suggest mixed-mode groups can generate external impacts, albeit with varying degrees. With almost all the mixed-mode groups holding meetings or events in public places, at a minimum, they are able to patronize local establishments. Such visits can help the local economy. Regardless of the types of groups, almost all the organizers interviewed mentioned that they had a chance to chat and eat together in a local café or restaurant, either as part of the event or after the event. Many groups even intentionally gather to support these venues. For example, organizers of vegetarian groups described that they usually search around and hold events in as many different vegetarian restaurants as they could in the neighborhood. An organizer of a women’s
social group indicated her intention to arrange group events to support restaurants and businesses owned by women in the local area.

Instead of isolating themselves, it was found that mixed-mode groups engaged in communication with local groups and organizations, which in turn contributed to the generation of group impacts. And this external communication took place at both incoming and outgoing directions. *Meetup* group organizers mentioned that they had been reached by other *Meetup* groups, local establishments and other local non-profit organizations for collaboration and cooperation. For example, the organizer of a book club group was contacted by local newspapers and a school library to write a blog promoting local interests in literature discussion. Interestingly, this type of community involvement not only helped the local community but also increased the publicity of the group, as more people get to know about the original *Meetup* group.

There were also some cases in which *Meetup* groups shouldered the role of helping the local community where the official authority was not allowed, not capable, or was reluctant to step in. For example, while beekeeping is illegal in some states, a *Meetup* group organizer mentioned that they were able to help farmers in remote villages with pollination so these farmers can be more productive in creating revenue. This act not only influenced the community in securing short-term financial resources but also helped improve the community’s long-term development in other aspects (e.g., human resources, economic development). In sum, these findings suggest that mixed-mode groups can be incorporated as stakeholders in policy deliberation regarding community development. For example, an initiative geared toward a youth recreation program should consider supporting the creation of, or working with, mixed-mode groups that
focus on the topics of sports, hobbies, and recreation, providing them with a location and other financial resources so that they can hold particular group events targeting young people. Similarly, to promote healthy lifestyles in the local community, an initiative can create a network platform consisting of mixed-mode groups interested in organic food, gardening, and vegetarianism, as well as related local establishments to facilitate exchange of resources.

There is no doubt that these mixed-mode groups need resources and support to survive before they can play a helpful role in community development. There are actually some Meetup groups engaged in gathering people who are currently unemployed and helping each other to learn skills (e.g., networking, frugal living, or new technology use) that may be useful for future employment. If they could obtain support from local authorities, it is believed that these types of groups may help mitigate the impact of unemployment at the local level. Hence, it is necessary that related policy initiatives addressing community development take into consideration the importance of ensuring group survival when collaborating with mixed-mode groups.

**Mixed-Mode Groups and Volunteering**

According to the U.S. Bureau of Labor Statistics (2011), 26.3% (62.8 million people) of Americans volunteered through or for an organization at least once between September 2009 and September 2010. Volunteers, in this report, refer to those people who did unpaid work (except for expenses) through or for an organization during this period of time. The most common volunteering activities identified were fundraising, collecting/preparing/distributing/serving food, and tutoring/teaching. This yearly report also indicates the volunteering rate in 2010 was similar to the rates observed in 2007 and
2008. As far as policy is concerned, these statistics bear on the impacts of mixed-mode groups. First, findings of this study revealed the substantial and extensive volunteering activities coming out of Meetup groups. It is questionable that these official statistics have precisely reflected the contemporary forms of volunteering participation through mixed-mode groups. Future official surveys may consider including those Internet-established groups to better capture the level of volunteering performed by citizens.

The Bureau of Labor Statistics’ (2011) report also shows that around 42.7% of volunteers became involved with their main organization after being asked to volunteer, and about 41.6% did so by actively approaching the organization. This pattern confirms the intermediary role of voluntary associations in bringing forth coordinated action, as advocated by social integration researchers (e.g., Putnam, 1993). It also suggests the potential of the Internet and other ICTs in facilitating volunteering. A large proportion of Meetup groups were shown to recruit members through passive online search engines, that is, prospective members located groups by going online and searching for groups on their own based on the parameters of geographic distance and relevance of group topics. It is thus expected that sustained mixed-mode groups are able to at least accommodate the preference of those volunteers who search out organizations when they would like to volunteer.

This study calls for a revised view of volunteering, in light of technological advancements that have engendered mixed-mode groups. It should be no surprise that an accurate sense of volunteering status can help formulate more efficient and effective policy initiatives for social integration and community development. In this regard, this study has made an initial attempt in hopes of inciting more empirical work identifying the
collective action of mixed-mode groups and the impact of technology on modern forms of volunteering.

**Methodological Implications**

Due to its exploratory and complex nature, this study employed a sequential and mixed methods approach to investigate the survival and impacts of mixed-mode groups. With the ecological and evolutionary perspective guiding the inquiries throughout the study, this sequential design can provide an expanded understanding of the phenomenon of interest (Creswell, 2009). This study makes methodological contributions on different fronts, including a combined approach to observing group evolution at group and population levels, a longitudinal analysis of groups, and investigation of group impacts through an online survey. Three points are detailed below.

**A Combined Approach to Observing Group Evolution**

In response to a call for more efforts to make the level of analysis as explicit and inclusive as possible (Monge & Contractor, 2003), a mixed approach of interviews, archived group data, and survey data used in this research articulated which part of the ecosystem was being investigated. Specifically, interview data revealed the evolutionary V-S-R processes at the group level, while the archived longitudinal group data showed the evolutionary and ecological process at the population level. By combining interviews and archived data, this research also adds to the existing list of studies applying a similar mixed approach to examining organizational evolution (e.g., Ariño & de la Torre, 1998; Doz, 1996; Raff, 2000; Tripsas, 2009; Van den Bosch, Volberda, & de Boer, 1999).

Employing a qualitative approach at the first stage of data collection, this research is the first study to date that brings to light the details of how mixed-mode groups in
general, and Meetup groups in particular, engage in the processes of organizing and group operation. In fact, compared with quantitative approaches, a qualitative approach has been relatively rare in examining the evolution of organizations (Monge et al., 2011b). Notably, while supporting Monge et al.’s (2011b) claims that qualitative methodology is expected to bring new and different insights into the evolutionary processes of organizations, this study also makes additional efforts to provide an extensive understanding of the evolutionary processes of groups. Among the 34 organizers being interviewed, 10 organizers were followed up on because of group closure, leadership change, or ostensible activity change. Not surprisingly, it is through these follow-ups that the conceptualizations of macro-and micro-niches and group migration across populations were derived from this study.

**Longitudinal Observation of Group Evolution**

A common limitation in the application of the ecological and evolutionary perspective is the tautological argument mistaking current fitness as a result of survival in the past, rather than as a propensity for future survival (Monge et al., 2008). Further, it is contended that testing evolutionary and ecological processes requires longitudinal data of sufficient duration to observe and distinguish the operation of variation, selection, and retention. The statistical survival analysis also has a similar requirement for the length of data collection. It is suggested that data should be gathered for a long enough time so that more than half of the sample experience the target event; in other words, the longer the study, the powerful the study (Singer & Willett, 1991).

In conforming to these said requirements, the longitudinal design implemented in this study is deemed to provide acceptable and valid insights into the evolutionary and
ecological processes of the sampled groups. The 100 randomly selected Meetup groups were observed over 18 months, and around 46 groups closed down by the end of the observation, indicating that an 18-month tracking period is long enough to allow for the observation of V-S-R mechanisms taking place in this sample. Moreover, the variables associated with these groups, both open and closed, were observed alongside the development of the groups. Therefore, a relatively complete picture of the evolutionary and ecological processes of the groups was obtained concurrently, rather than in a retrospective way.

**Online Survey and Analysis of Group Impacts**

With the heavy focus on growth, survival, and demise of organizations, impacts are a less addressed topic in the evolutionary literature (Aldrich, 1999; Aldrich & Ruef, 2006). Nonetheless, building on resource dependence theory and group boundary spanning research, this study delves into the topic of group impacts. Despite its cross-sectional nature, analysis of the online survey data with Meetup groups helped identify the process of how mixed-mode groups engaged in internal and external strategies to facilitate external communication and resource acquisition, which in turn achieved group outcomes. Additional multi-group analysis was conducted, which further yielded a systematic understanding of the influence of varying degrees of multimodality on group impacts, illuminating the differences between higher and low mixed-mode subsamples. Mixed-mode organizing is a nascent topic that has received relatively little empirical attention, not to mention the application of multi-group analysis for the investigation. In this regard, this study helps fill a gap empirically and methodologically.
Given the exploratory nature and the small sample size encountered in the multi-group analysis, PLS was chosen for the analysis of online survey data. Certainly, the PLS technique has trade-offs including the fact that it is a non-parametric method. Yet, although PLS is less frequently used in communication research, it has wide applications across different streams of social sciences, such as strategic management (e.g., Hulland, 1999; Mezner & Nigh, 1995), management information systems (e.g., Dibbern, Goles, Hirschheim, & Jayatilaka, 2004; Liang, Saraf, Hu, & Xue, 2007; Majchrzak, Beath, Lim, & Chin, 2005), e-commerce (e.g., Pavlou & Chai, 2002), organizational and group behavior (e.g., Brock & Zhou, 2005; Gupta, Huang, & Niranjan, 2010; Howell & Shea, 2006; Jung, Sosik, & Baik, 2002; Sosik et al., 2009; Yagil & Luria, 2010), marketing (e.g., Fornell & Larcker, 1981; Reinartz, Krafft, & Hoyer, 2004), and consumer behavior (e.g., Fornell & Robinson, 1983; Hennig-Thurau, Henning, & Sattler, 2007) (see a review of PLS applications in Henseler et al., 2009 and Sosik et al., 2009).

It is worth mentioning that, despite the violations of assumptions, additional statistical tests of the data were run with AMOS, a relatively well-known software for structural equation modeling in the communication field. The results from AMOS were consistent with those obtained from PLS, thus confirming the valid results that were reported in this study. Invariably, as this research moves to the next phase of theory confirmation and theory testing, other covariance-based structural equation modeling methods such as LISREL and AMOS will be more appropriately employed.

**Limitations**

There are several analytical and methodological limitations, especially during the course of data collection, in this study. First, this study relied on Meetup.com as the
single research site for different sources of data collection. Despite the possible concerns about the generalizability of the findings, Meetup.com is by far the largest website of its type, providing a platform accommodating 9.5 million users, hosting more than 90,000 local groups, and spanning 45,000 cities across the globe. Therefore, it is anticipated that the popularity and prevalent use of Meetup.com lends itself as a suitable site for an exploratory investigation of the phenomenon of mixed-mode groups, which is the objective of this research. Future efforts would undoubtedly need to expand to other websites of mixed-mode groups for comparative analysis, supplementing the findings derived from this study.

Second, comparative analysis on other websites of mixed-mode groups can also address another set of analytical limitations related to the choice of Meetup.com as the research site. While it is the advantageous feature of Meetup.com to have archived group data publicly available, it is conjectured that this feature may bias the interpretation of group organizing. A mixed-mode group on Meetup.com is motivated to hold group events in order to maintain an attractive group profile. It is also likely that a Meetup group will tend to have long latency period before the group closure is officiated, due to such a public presence. In other words, membership size and the number of group meetings displayed on the website may be misleading. A group may have listed 10 meetings in a month, but in each group event, only one or two members showed up. In this case, a group can be seen as dormant even though it does not officially close down. Such analytical biases may nevertheless arise. A better strategy would be to use the key variables investigated in this study and test them in a different population of mixed-mode
groups such as Facebook. If the differences are observed, these analytical biases can be confirmed to exist, and selection of additional variables will be needed.

Third, findings of this study need to be interpreted with caution, given a number of possible measurement biases. As mentioned earlier, the group variables such as membership size and number of meetings listed on Meetup.com may be inaccurate to the extent that they fail to reflect the real situation of the groups under study. Moreover, due to the exploratory nature of the research topic, instruments used in the online survey were largely derived from the analysis of the data gathered in the interview phase. Despite the resulting acceptable reliability and validity of these scales, these measurement concerns may nevertheless reduce the significance of the findings. Yet it is believed that these limitations can be better dealt with in future research, which would allow for more confirmatory testing of the hypothesized relationships identified in this study.

Fourth, there are other concerns about data collection. It was conjectured that interview and survey data were likely drawn from groups that had survived by the time the data were collected, without accounting for those groups already closing. Moreover, due to resource and time constraints, this study merely focused on collecting data at the group level, so group organizers were the ones providing responses to the interview and survey questions. Yet, possible solutions were implemented to address these concerns. For the former, extra efforts have been made to probe the organizers to share their thoughts about any less active groups they also organized. Interviewed organizers were also followed up as much as possible. For the latter, 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. In other words, organizers’ responses were deemed sufficient to inform the aspects investigated in this research.

Admittedly, future work will need to focus on obtaining data at the individual level, which can help draw a more complete and useful picture of groups’ boundary work, internally and externally, initiated by members. In particular, through members participating in multiple groups, there may emerge cross-cutting ties between groups, which correspond to a network view of groups, one that emphasizes interconnections between groups at individual and group levels beyond the pre-set group boundaries (Katz et al., 2004; Lazer & Katz, 2003; Marin & Wellman, 2010). The individual-level data can also help understand the acquisition of social benefits (e.g., development of weakly tied relationships and occupational diversity of one’s networks) as a result of individuals’ multiple affiliations in voluntary associations (Lauer & Yan, 2010; Wollebæk & Selle, 2002).

Lastly, another noteworthy issue is the low response rate for interview recruitment (14%) and the online survey (13.82%). This result was due in part to the high level of privacy concerns held by users of Meetup.com, which influenced the decision of no follow-up reminders to potential respondents. According to the personal communication with the research unit of Meetup.com, they had a similar level of response rate when they conducted research internally with their users. While following the privacy policy of Meetup.com (i.e., a daily quota for sending out invitations and no reminder emails), efforts were spent to maximize the response rate of the online survey, including personalizing the invitation email, prolonging the data collection time and providing incentives in the form of a raffle. Further, procedures of random sampling were
implemented in obtaining different sources of data, which should help assuage the validity problems as a result of low response rate and small sample size. Most importantly, the nonresponse bias analyses uncovered no evidence that the survey sample was affected by nonresponse bias.

**Future Directions of Research**

This research is the first study to date providing an understanding of the growing phenomenon of mixed-mode groups with depth and breadth. This study has made contributions on different fronts as detailed above; it also holds great promise for more fruitful future research. Building on the findings, a few directions for future research are suggested.

**Mixed-Mode Organizing and Suggested Conceptual Approach**

One of the advantages of mixed-mode organizing is the capacity to share information and coordinate activities easily either within a population of mixed-mode groups or across populations. Findings of this study suggest that surviving *Meetup* groups engaged in different forms of collective action. On the one hand, consistent with club goods theory (Sandler & Tschirhart, 1980), benefits of the collective action (e.g., relationship development, group discounts) were exclusive only to group members who attended the meeting. Yet on the other hand, members that are mostly “on paper only” (Smith, 1972, 1999) had access to public goods in the form of communal information and direct connections. In other words, absent members can still enjoy limited benefits in the form of communal and connective public goods (Fulk et al., 1996). Indeed, in the campaign context, the technological affordance of enabling direct connections among
volunteers has been found to be critical to successful mobilization efforts (Teachout, 2004).

Admittedly, inferring from the qualitative data, the claims about differential collective action of mixed-mode groups were made without more solid and quantitative evidence to support them. Yet building on the findings of this study, it is evident that holding an ecological view is useful in conceptualizing collective action of mixed-mode groups across contexts. For example, Meetup groups were observed to interact with local venues and the local community, which resulted in the generation of public goods that benefitted not only the groups involved but also the local community overall. For members involved, they are likely to receive benefits in the form of club goods. In contrast, when groups do not meet, communal and connective public goods can be provided online to members, prospective and absent alike.

In sum, these inferences indicate that the collective action of mixed-mode groups may be better explained by integrating club goods theory and public goods theory. More research is needed to investigate different forms of collective action of mixed-mode groups in online and face-to-face contexts. It is possible that mixed-mode groups can produce public goods and club goods concurrently, since face-to-face meetings generate club goods, but public goods are still provided online even when groups are not meeting face-to-face. Research can also examine whether (and how) the generation of different forms of collective action is mutually beneficial or disadvantageous to the survival of groups. For example, a social mixed-mode group is likely to generate club goods as a consequence of the group activity. Nonetheless, as more and more people acquire relational benefits as part of the connective public goods provisioned in the online space
of the group, they may start holding private events and attend group events less frequently. In this way, the ability of the group to generate club goods for other members may be impacted. As mentioned in Chapter 4 and 5, this is actually a common situation among the Meetup groups observed, highlighting the tension between interpersonal relationship development and collective action.

The multimodal characteristic of organizing also calls for more refined measurements of the environment and ecology of mixed-mode groups. For a given Meetup group, other Meetup groups or groups from other online populations could be seen as competitors or collaborators seeking similar or dissimilar resources from the online environment. But when it comes to offline meetings, a Meetup group is influenced not only by other mixed-mode groups but also by other organizations, businesses, and the locale. In fact, the non-significant effect of group niches (measured by group member requirements) on group survival as found in the longitudinal analysis (in Chapter 5) further suggests the necessity of developing a more accurate set of measurements, by tapping into the ecology and environment of mixed-mode groups as they are subject to the environment in both online and offline forms.

Consideration of Group Topics and Niches

It is noted that except for group type (for-profit, not-for-profit), group topics were not included in the data analyses. The reason for this exclusion can be attributed to the difficulty to define and code group topics based on the ambiguous information listed on the group webpage. Nonetheless, this research will benefit from future study that factors in group topics and differentiates how the survival of certain types of groups are likely to be influenced by the demographic and ecological factors as identified in the longitudinal
analysis of this study. Specifically, it would be helpful to examine whether the claims about “the market type of organizations,” which is used to describe certain traditional voluntary organizations (Selle & Øymyr, 1992), will hold true for mixed-mode groups. Groups focusing on leisure, language, and culture are thought of as the “market type of organizations” due to their characteristics of being easy to establish, simultaneous high participation and high turnover in membership, and being less integrated in the external environment (Selle & Øymyr, 1992). That is to say, these groups tend to have high turnover in leadership and become mainly introverted in their activity and ideology. As such, it would be interesting to research whether and how the ecology and demographical factors would influence the survival of market-type mixed-mode groups.

Specifying group topics can also serve another purpose: identifying group and population niches. In Chapter 5 and Chapter 6, it was found that certain group topics or combination of topics, as well as geographic locations, influenced the interaction among mixed-mode groups in the “niche” space. For example, an organizer revealed that, in a college town, several broadly defined sports-and-recreation Meetup groups, including her group, developed into a strong alliance, with the largest group playing the leader role. In this case, despite the overlapping niches, these groups tended to cooperate and support each other. In a city on the East Coast, the organizer of a cultural group mentioned that the immigrant culture was prevalent, which helped him to recruit members easily and to obtain cooperation from other Meetup and non-Meetup groups focusing on the immigrant community. Group topics and geographic locations can thus both be seen as sources of variation that a group needs to take into account when deciding how to occupy differential or overlapping niches with other groups within the population. Future
research can delve into group topics and the characteristics of geographic regions through a larger, representative sample of mixed-mode groups.

**Group Migration and Formulation of Ecology**

Although group closure is the target event investigated in this research, it must be noted that no normative connotations are associated with the occurrence of group survival and closure. Researchers have articulated a possible conceptual bias in organizational research of identifying persistence/survival with success and closure with failure (Fernandez, 2008; Hager, Galaskiewicz, Bielefeld, & Pins, 1996). As a matter of fact, groups were observed to close down on Meetup.com, but in reality either informally transferred to another Meetup group, or migrated to other cost-free websites, such as Facebook and BigTent. Reflecting the multimodal characteristic of mixed-mode groups, group migration allows for refined conceptualizations of the evolution and impacts of voluntary associations. Future study may need to expand the research focus on where, when, and how mixed-mode groups enact the V-S-R mechanisms. For example, the V-S-R processes may be initiated or reinitiated by groups when they move into a new domain, which results in another round of evolution. Investigation should also evaluate group impacts in a broader way. When group migration occurs, it is likely that the generation of group impacts is affected, yet still maintained. When formulating research questions, researchers should focus on either group impacts overall or merely those associated with a particular website.

The phenomenon of group migration warrants further investigation because it is well-aligned with the ecological perspective, which suggests different populations may interact with each other in the form of commensalistic or symbolic relations. The former
refers to the situation in which different populations rely on similar resources in the environment, while the latter describes the complementary and different needs of populations for resources in the environment (Aldrich, 1999; Hawley, 1986; Monge & Contractor, 2003; Monge et al., 2008; Monge et al., 2011b). It is believed that further investigation of whether and why a Meetup group transfers to another similar population (from Meetup.com to Facebook) or to a dissimilar population (from Meetup.com to a business network website) can help provide important insights into the evolutionary dynamic at group, population, and community levels. A potential research direction would be to examine whether, and how, different populations accommodating mixed-mode groups exhibit competitive or mutualistic relationships in terms of obtaining resources from the environment.

As a concluding remark, a well-demonstrated fact is that technological developments may alter or blur distinctions between individuals, groups, and communities (Rice, 1987). Through communication technologies, groups may form based on common interest, yet exhibit varying degrees of structural complexity. For example, a related phenomenon is called network collectivism, which refers to collectives of associated individuals that bind networks together based on common interest (Baym, 2007). These collectives are grouped across different technological forms, such as social network websites, video sharing websites, and blogs. The growth of such loosely-defined groups may require a refined view of boundaries and environments under the ecological and evolutionary framework. On the one hand, it is expected that the multilevel analysis inherent in the ecological and evolutionary perspective can equip us with a useful analytical lens to examine these redefined and reformulated groups. On the other hand, it
is highly likely that technological changes may call for new research domains to enrich the concepts of ecology and evolution.
Appendix A
Interview Protocol

1. Can you briefly tell me why and how you started the group on Meetup.com?
   ➢ Was your group created through Meetup? Or did your organization already exist?
   ➢ Can you describe to me briefly how you communicate with members to inform them about various activities and events the group does/will be having?
     o Probe: What features of Meetup do you use?
   ➢ Do you use other similar websites, like Craigslist, Facebook, Twitter? If yes, how is that different from your experience of using Meetup?
   ➢ Have you ever started a traditional f2f group, like a social club or an exercise team? If yes, can you describe that group? How is that different from your experience of using Meetup?
     o Probe: Think about the types of things you did for that f2f group, compared to the group you have through Meetup.

2. With the growth of your group in the past months (years), I am curious about how you see the development of your group through Meetup. I know that some groups were started to socialize, but later on, transformed into a volunteer or service group, groups that benefit people outside the group.
   ➢ What was the initial reason for your group? What is it now?
   ➢ How did it evolve (how did its core mission or goals change)?
   ➢ How would you describe your group’s growth since its establishment on Meetup?

3. Let’s talk more specifically about how you started the group through Meetup.com.
   ➢ How did you recruit members after you set up the group on Meetup? For example, some groups would post on Craigslist or Facebook their Meetup group webpage. What did you do to recruit members?
   ➢ In addition to recruitment, I am curious whether you have done any advertisement about your group. How did you let people know about your group?
   ➢ Is there any source that you relied on to promote your group? It could be any individual, website, discussion board or any type of sources.

4. Next, I want to know more about your experience organizing group activities. Think about your group meetings through Meetup in the past six months.
   ➢ How did you decide the location for a meet-up?
If it is a public place, like a restaurant or a park, how did you get it prepared? Do you need to do certain things, like talking to the restaurant owner or the park authority?

If you need help in making these arrangements, where would you usually ask for help?

If you have assistant organizers, how did they help you?
  o Probe with the following question if they have identified earlier that they have used other websites or as an existing organization: In terms of your experience organizing group activities through Meetup, how do you think Meetup useful or not useful, compared to other websites/(or as an existing organization, how was the use of Meetup useful or not useful in helping your organization)?

5. Next, I’d like to know more about how you communicate with group members. Let’s talk about your communication with group members before, during and after the meet-up. Think about the meet-ups that you had in the past six months.

  ➢ Before each meet-up, how did you keep in contact with your group members, in addition to the event announcement?
  ➢ Can you tell me what this communication was about before the meet-up? Was it mostly RSVP? Or any other information?
  ➢ After we talked about your communication before the meet-up, let’s move to your communication with group members during the meet-up. Think about your meet-ups in the past six months. Would you say that the attending members were mostly the same or different each time?
  ➢ During these meetings, can you give me an example of how you started in a meet-up? Assume that I am a newcomer, I’d want to know how I can participate in the group.
    o Probe: Assume that I am a newcomer, when I first attend a group activity, how can I recognize other group members? Do you have ice-breaker time or other group activities arranged? Or you would let people get acquainted with each other?
  ➢ After each meet-up, how did you keep in contact with group members?
    o Probe: Did you use other technologies to keep in touch, such as email, mailing lists, message board, cell phones? If yes, do you think these different ways of communication helped keep people involved in your group?

6. In addition to your communication with group members, I’m also curious about the roles of other people that have helped you to get the group work done. So next, I want you to think about your group meet-ups in the past six months.

  ➢ Did you get help for the organizing of each meet-up? (from people inside and outside the group)
  ➢ Probe with following question if they seem to recall some individuals:
OK. Let’s put these as a circle on a map. I have written down these names here that you just mentioned. If you don’t feel comfortable giving out the full names, just put the nicknames or some markers.

➢ First, can you tell me how you define your relationships with these people on this map with “you” as the central node? (For example, someone you met on the Internet, spouse, parent, child, sibling, relative, friend, neighbor, coworker, acquaintance, or a common member of a club or organization, a member of your group). After you identify the relationships with each of these people, draw a line linking you and them.

➢ What are your interactions with them? (For example, how many times in the past month did you communicate, in any way, with them?) If you think you had contact with a particular person four times in the past month, just put 4 on the line between you and this person.

➢ OK. The last piece to complete this map is to draw a line between these people around you. Can you go over this and tell me who do you think knows each other? For example, if you think A and B know each other, then, just draw a line between them.

➢ And if possible, can you also identify the relationships among them?

7. The last question is about whether your group has ever participated in certain activity inside or outside the group. I know that some groups will work together to organize a joint event in their community, like volunteer groups doing “cleaning the park,” which benefits not only the group members but also those people outside the group. In your experience, have you ever organized an activity with other groups or other businesses/organizations that can also be beneficial to people who are not members of your group?

➢ If yes, could you tell me about the experience/activity?

➢ Do you think this arrangement helped keep the people involved in your group? In other words, do you think the activity had any outcomes that were beneficial to the group and members’ connection to your group and each other?

➢ In addition to activity outside the group (or If you group did not have such activity outside the group), could you tell me whether you had any group activities that were not scheduled on Meetup, but turned out helping keep members’ connections to the group and each other? For example, in some groups, a few group members will volunteer to help prepare food when a member has special occasions, like birthday party or baby shower. In your experience, has your group ever engaged in such activity? If yes, could you tell me about the experience/activity?
Appendix B
Coding Categories for Interview Data

1. Group Creation
1.1 Prior History of the Group: the degree to which members knew each other before the group was established
1.2 Reasons of Creating the Group: reasons of why and how the group was created on Meetup.com
1.3 Reasons of Joining the Group: reasons of why the organizer and/or members joined the group
1.4 Group Transition: situation involving old organizers who stepped down and new organizers who took over; the group experienced slowdown of member involvement
1.5 Reasons of Group Closure: reasons of why the organizer closed the group
1.6 Reasons of Slowdown/Low Turnout: reasons of why the group did not turn out as expected or had low turnout

2. Types of Group
2.1 Platform of Group Creation
2.1.1 Original Meetup Group: a group that was created purely on Meetup.com
2.1.2 Existing Group: an existing group that uses Meetup.com for different purposes of group activity
2.2 Group Topics: topics characterizing the group goals and activity
2.3 Nature of the Group: the tendency of the group for making profits
2.3.1 Non-profit/Social Group: a group that was created and maintained not for business purposes
2.3.2 Profit-based Group: a group that was created and maintained for business purposes

3. The Locale: the local demographic information

4. Recruitment and Advertisement: the way the organizer engaged in recruiting or advertising the group

5. Development of Group: phases and future of the development of the group

6. Communication and Group Interaction
6.1 Internal Communication: group communication before, during and after the event. It also includes communication between the organizer and the assistant organizers as well as communication outside of the organized event
6.1.1. Group-related Communication: communication between or among members related to group activity
6.1.2 Outside Group Communication: communication between or among members outside of group activity
6.2 External Communication: communication involving people or entities from outside
6.2.1 Incoming Flow of Communication: communication initiated by people or entities from outside the group
6.2.2 Outgoing Flow of Communication: communication initiated by the organizer and/or members to people or entities outside the group
6.2.3 Two-way Flow of Communication: communication taking place between the organizer and/or members and people or entities outside the group
7. Management of Organizing

7.1 Structure of Organizing: the division of labor in terms of organizing group activity

7.1.1 Organizers Hands-Free: organizer got involved partially, and AO(s) mostly run the group

7.1.2 Organizers and AOs split: organizer and AO rotated the organizing tasks

7.1.3 Organizers in Charge: the organizer was in charge of organizing, with AO doing little

7.2 Group Policy: the rules in place for the group to encourage or discourage certain activities or practices

8. Logistic Arrangements: coordination of activities, such as selection of physical locations

9. Embeddedness of the Group (outcome-oriented, active management of ties)

9.1. Embeddedness at Individual Level: organizer’s (or member’s) involvement in his/her social networks that contributed to organizing of group activity

9.1.1 Internal Ties within the Group: organizer’s (or member’s) involvement in his/her social networks mainly connected as a result of the group

9.1.2 External Ties outside the Group: organizer’s (or member’s) involvement in his/her social networks mainly outside of the group

9.2 Embeddedness at Collective Level: the group’s connections with other groups or organizations that contributed to organizing of group activity (e.g., joint group activity, sponsorship), without specifying the ties made by which individuals

9.2.1 Other Meetup Groups: other groups, local or from Meetup.com, connecting to the group through joint events, information exchange, cross-listing or other types of ties

9.2.2 Other Organizations/Groups: other organizations connecting to the group through sponsorship, cooperation, or other types of ties

11. Collective Activity/Joint Group Events (examples)

11.1 Internal Group Activity: group activity including scheduled and non-scheduled types

11.1.1 Compositions of Attendees: the composition of people who attended the event

11.1.2 Interaction with the Local Community: group activity involving interacting with local community, including non-profit organizations and businesses.

11.2 External Group Activity: group activity involving cooperating with other groups or organizations

12 Nature of the Tie

12.1 Relational Multiplexity (member-level): relationships formed between members in addition to membership (e.g., friendship, romantic relationships, member-organizer)

12.2 Affiliation Ties: the group’s connection being built with another group or organization because the overlapping memberships

12.2.1 Direct Ties at Group Levels: the other organization or group directly connected to the group not only because members joined both two entities but the two entities had direct interaction with each other

12.2.2 Indirect Ties at Group Levels: the other organization or group connected indirectly to the group mainly because of the members joining both two entities

12.3 Latent Ties: the other individuals or groups (organizations) that ego group attempts or desires to hook up with
13. ICT Use
13.1 Meetup features: use of email, message boards, RSVP for group communication and coordination on Meetup, but no other ICT use
13.2 Other ICT use
13.2.1 Meetup feature: use of email, message boards, RSVP for group communication and coordination on Meetup.com
13.2.2 Facebook/Craigslist: use of social networking websites for group communication, coordination and recruitment
13.2.3 Others: use of other ICT, such as cell phone or private email, eVite

14. New (Meetup) vs. Old of VA:
14.1 Unique Features of Meetup: organizers mentioned the unique characteristics of Meetup
14.2 Finding Meetup: the way the organizer found the website of Meetup.com

15. Comparison: comparison of the group with other similar groups (less successful or more successful ones)
15.1 Organizer’s Groups: a group for comparison with organizer having direct connections with it
15.1.1 ICT-enabled Groups: groups created or maintained involving ICT use, including Meetup groups
15.1.2 FtF Groups: traditional social or voluntary groups
15.2 Other Groups: groups not established or organized by the organizer
Appendix C
Survey Instruments: Scales and Items

Group Age
When was your main group created on Meetup.com? Month ___ ___ Year 20 ___ ___
(calculation of the total group age in months from creation time till February, 2011)

Group Size
About how many members do you have in your group at present? ___ ___ ___ ___

Meeting frequency
How often has your group met in the last month? ____ times

Internal Strategies (1 = Never, 2 = Once, 3 = A few times, 4 = Many times, 5 = Regularly)

Whether and how often you have used the following strategies to run your group
1. Group policy: Create and implement group policy such as RSVP, requiring pictures, or specific rules for participating in group discussion and events
2. Requiring Member Dues
3. Member involvement: Members suggest the event or host the event
4. Diversity of activities: Arrange different types of group activities
5. Creation of subgroups: Create spin-off groups outside of the main group
6. Private events: Arrange informal activities on a smaller scale outside the formal meetings
7. Focused topics: Maintain a focused group topic, instead of diversifying activities
8. Use of technology for communication: Increase the use of technological features (e.g., discussion forums on Meetup.com, Facebook, Twitter) for members to communicate with the organizer as well as with each other
9. Diversity of locations: Rotate different places for hosting group events
10. Regular events: Hold regular events at specific times

External Strategies (1 = Never, 2 = Once, 3 = A few times, 4 = Many times, 5 = Regularly)

Whether and how often you have used the following strategies to run your group
1. Copy other Meetup groups: Reference other Meetup groups such as event formats or organizing style
2. Copy other non-Meetup Groups: Reference other non-Meetup groups/organizations such as event formats or organizing style
3. Cross-post events by other Meetup groups
4. Joint events with other Meetup groups
5. Cross-post events by other non-Meetup groups/organizations
6. Joint events with other non-Meetup groups/organizations
7. *Activity as part of local events*: Arrange group activities as part of the events taking place in the local community
8. *Interaction with local venues*: Build/maintain contact with local establishments such as having a place to hold group events, sponsorship or other discount deals

**Density of Resources** (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*) (AVE= 0.509, Composite Reliability= .854, Cronbach’s α = .796)

Please indicate how often you have received help of any sort (e.g., advice, information, money, cooperation) for running your group from the following.
1. Group members (DR1)
2. Other *Meetup* groups (DR2)
3. Local venues to hold group events (e.g., restaurants, church, community center, library) (DR3)
4. Other organizations (e.g., neighborhood association, non-profit organization, local business) (DR4)
5. Personal contacts (e.g., friends, family, co-workers) (DR5)
6. Members of other *Meetup* groups (DR6)

**Network Communication** (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*) (AVE= 0.509, Composite Reliability= .861, Cronbach’s α = .806)

Please indicate how often the following have contacted you over the course of your group development.
1. Other *Meetup* groups (NC1)
2. Other non-*Meetup* groups/organizations (NC2)
3. Other Meetup groups (NC3)
4. Local venues to hold group events (e.g., restaurants, church, community center, library) (NC4)
5. Other organizations (e.g., neighborhood association, non-profit organization, local business) (NC5)
6. Personal contacts (e.g., friends, family, co-workers)
7. Members of other *Meetup* groups (NC6)

**Group Impacts** (1 = *Strongly disagree*, 2 = *Somewhat disagree*, 3 = *Neither agree nor disagree*, 4 = *Somewhat agree*, 5 = *Strongly agree*) (AVE= 0.609, Composite Reliability= .903, Cronbach’s α = .874)

Please indicate your opinion about how your group has contributed to the following outcomes.
1. Build and/or maintain relationships among members (OC1)
2. Create an opportunity for people to socialize based on common interests (OC2)
3. Create an opportunity for people to do something together related to the group topic (OC3)
4. Build a community around the group topic (OC4)
5. Maintain local area interest in the group topic (OC5)
6. Help the local community (e.g., patronizing local establishments, cooperating with local organizations) (OC6)

**Mixed Modality**

Does your group use other ways for group operation and communication in addition to Meetup.com (e.g., having a mailing list, a group on Facebook or Yahoo, or an existing organization)?

1. Yes
2. No
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