Networking in Everyday Life

by

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Abstract

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Contemporary networking in Canada, like most of the developed world, involves significant use of media to maintain relationships. This is not the use of media for faraway alters where in person contact is difficult, but media use within the very fabric of everyday life alongside in person contact.

Past debates about the effects of new media have frequently focused on a medium's potential for social isolation. These debates have resulted in ambiguous, muted or contradictory findings. So instead of suggesting another response to the issue of social isolation, this thesis reorients the focus towards a different question: under what conditions are alters accessible and how does multiple media use affect this accessibility? Rather than suggest that new media simply offer "more" social accessibility, I contend that they complicate social accessibility by offering individuals increasingly differentiated ways to habitually maintain contact with each other. The result of this differentiation is that while individuals might be able to maintain contact with more alters (or at least just as many) in the abstract sense, they end up maintaining contact with the most accessible alters rather than alters with whom one has the strongest ties. This is the conundrum of multiple media use: how is it that each individual medium offers increased convenience but the sum total of media use makes life less convenient, more planned and more complicated? I suggest it is because media use cuts across longstanding social norms of public and private spaces (or public and private

time) without offering a coherent normative framework as a substitute. Instead, individuals are differentially accessible via each medium. Moreover, this accessibility is related more to emergent personal habits than to tie strength.

Data for this study comes from 350 random-sample surveys and 86 follow-up social network-oriented interviews in East York, a former borough on the east side of downtown Toronto, Canada. The data were collected in 2005, before the widespread adoption of social networking software, but after the widespread adoption of cellular telephones, instant messaging services and email.

Dedication

For Jeremy,

Forgiver of late nights, insider informant for every gadget and software imaginable,

and sounding board extraordinaire.

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Chapter 1

Introduction

THE first thing I do in the morning is turn on my ipod. It is a recent model, and really more of a tiny touchscreen computer than a portable music player. The home screen tells me I have a few emails, several new tasks, a handful of messages on Facebook (a web service that collects lists of friends), and some new posts on Twitter (a web service that publishes journal entries of less than 128 characters). I am barely awake enough to process what cereal to eat and I am deluged with social information. Within an hour, I have also checked my cell phone (voice and text messages), my landline, convened with my spouse (who has gone through a similar sort of checking) and made coffee. Oddly enough, I have been told that writing a dissertation is a solitary experience. I assume that held true in the days before laptops and mobile computing.

Some of these technologies are new to me. I am only a recent convert to Twitter, and I have only been on Facebook for less than a year and a half, yet somehow these technologies are now an important and even taken-for-granted part of the way I know and interact with my friends and colleagues. But with the seemingly continual proliferation of new media technologies, is it possible to stop long enough and ask how these technologies, collectively, are affecting the practice of maintaining ties in everyday life? Practically speaking, how can scholars address the issues of a con-

stantly changing media landscape with data that take so long to collect, code, and analyze that the objective conditions have changed before most results are published and distributed? We can do this because change happens at different scales. Some of these are minute and mere fashion (such as a choice between two competing social software programs, Facebook and MySpace), others are wedded to the life course or one's finances (such as whether there is a single computer in the home or one for every member). Some social changes take decades or generations, while others would change faster if only my social network could keep up with me (or I with it).

To use a meteorological metaphor, some aspects of the proliferation of new media are like trying to predict the weather—even the experts are wrong half of the time. Yet, with a comparative context, enough data and some solid theory, it is still possible to tell that the climate is changing. This dissertation is about the changing media climate and its relationship to the maintenance of social ties in everyday life.

In his introduction to "Man and his urban environment", Charles Tilly suggests that the author addresses the prickly question of urban planning "how much and how does the physical form of the city itself shape the social lives of the men [sic] within it" (Michelson, 1970, vi). It was an apt question, and still a relevant question. Yet, in the past 20 years we have seen a proliferation of communication devices that superimpose a network of access on top of the physically arranged network of buildings, parks and streets. Seen as merely a means to an end, we can ask simple questions about these media, such as "does the use of one medium lead to more social capital", or "do some people use these media more than others". But beneath simple relationships between specific media and behaviors is a new prickly question: How does the ecology of media use shape the social lives of the people who—whether or not they use said media—still experience it as part of the orchestration of everyday life?

To address this thesis, I will be examining networking from the perspective of the individual, making this an egocentric analysis. However, this still entails an exami-

nation of networking at various levels. This includes the individual level, the level of the network and its composition and the level of individual relationships with specific personal network members. At all levels, one can ask the overarching question: *How can we characterize the strategies of multiple media use so that it makes obvious (1) how individuals think about their networks, and (2) how they act on those networks?*

Returning to the anecdote about my morning, consider that each medium represents a slightly different slice of the people I know and interact with. My landline is reserved for close friends, telemarketers (unintentionally) and long distance conversations. My cell is primarily used to coordinate with my spouse, email is primarily for work ties and sharing novelties with my peers, Facebook is used as a social "third space" for friends and relatives. I use Twitter in a quasi-professional way to broadcast short life updates. I use instant messaging for emotional support at a distance and chatting with my spouse when I am on the road. And of course, my mailbox is used for greeting cards from my parents, in-laws and the occasional friend. Of these, only the landline and the mailbox are fixed to a specific place, while the remainder are tethered to signal, either wireless or cellular. And none of them offer a complete picture of my relationships, although some do better than others.

One may think of social life presented here as a city without traffic lights, contacts whizzing by in the email lane, intersecting with cell phone conversations and knocks on the front door. The image is anarchic and stressful, but not entirely accurate. Granted, if we believe social life consists of contiguous events bounded in space and time, this picture is like a collision course of activity. But yet, social life is still orderly. Only we cannot name that order using modern notions of calendars and places alone. That is not to say we must do away with modern notions. Unlike early pundits of the Internet age, I am not here to ring the death knell for distance (Cairncross, 1997), or envision a future bereft of temporal order (Hassan, 2003). Rather, I take a middle ground that these aspects of social organization have now been subsumed under a

more abstract and encompassing logic—the logic of social accessibility.

This thesis is an exploration of how individuals regulate access with their social ties in everyday life. How do people regulate access in general? Do people have styles of social access? Is access role specific (as I may have implied with quasi-role specific media discussed above)? How do we know which media people will use with whom and when? And how can we characterize accessibility in such a way so that the concept can encompass even newer media technologies we have yet to imagine but are sure to arrive in the coming years? Social ties are available on a specific medium, but they are not exclusive to a specific medium. So as the number of new means for accessing individuals increases, it surely interacts with our sense of how to reach and maintain relationships.

Inherent in this theory is the assumption that there are certain constants to social life that persist and infuse networking regardless of the media. First, humans are pro-social animals interested in making contact with each other and sharing information, affect, and support. Obviously, not every person wants to support, share or exchange with all other people, but virtually all humans want to share with someone. Second, individuals have a concept of their social network, even if they do not define it as such. These are the people for whom an individual is most prone to sharing information, affect, and support. If these are voluntary ties, or ties where the relationships are based on interpersonal closeness rather than a specific function (consider a friend versus a sales clerk), then this social network is called the personal network. Third, social ties in the personal network are differentially accessible. On one level, this is the case because media are differentially diffused throughout the population. But even if two alters are users of a particular medium, they will differ in their frequency, intensity, and responsiveness. But on a more fundamental level, encompassing in person interaction as well as mediated interaction, even if information can transcend space and time, one's primary attention can only be on one thing at one time. Thus, even if my entire

social network is at a party, I cannot talk with them all at the same time. Granted, I can talk *at* most of them (perhaps using a microphone) at once, but it would break down as soon as everyone tries to reply at once.

Beyond these constants is a veritable cornucopia of possible logics and combinations. Some people may eschew the Internet entirely, such as the drop-outs noted by Katz and Rice (2003) and Lenhart (2003). Others may be perennial busybodies eager to use the latest gadget and plumb its obscure features. And some will try to find a balance between these two poles in a strategy that harmonizes their drive to maintain contact with the practicality of doing so through a number of possible channels. This thesis examines many of these combinations as they are present in Toronto in 2005, as a snapshot of the evolution of networking in everyday life. I do this using a representative sample of 350 individuals in East York, a former borough just east of Toronto's downtown core. Approximately one quarter of these individuals ($N = 86$) also completed a secondary in-depth interview that goes beyond broad claims about behaviours towards richly detailed descriptions of socializing and communication with these respondents' personal social networks.

This thesis begins with a theoretical chapter that lays down a framework for the subsequent analysis. Such a framework should encompass the way individuals think about and perceive other individuals as well as how they act on these thoughts. It should also be able to consider new media not as mere parenthetical novelty but as an active participant in the organization and maintenance of relationships. Media are not simply a neutral gateway enabling individuals to access their peers. By contrast, each medium has unique features for learning about and coordinating with one's alters. Some of these features are rarely employed by individuals (such as call forwarding), while the usage of other features depends on one's social history and context (as we have learned from studies of the social influence model, c.f. Campbell and Russo, 2003). Thus, to act on one's wishes to engage with others, there are not only a variety

of possible avenues, but also a variety of possible ways for employing any medium.

To derive such a theory, I draw upon philosophical pragmatism as a theory of action and ecological psychology as a theory of how actions are understood by individuals. Therein, I assert that individuals do not act on structure, as is commonly assumed, but on perceptual cues given from this structure. Admittedly, this is a subtle difference. However, this distinction promotes the idea that what individuals know of social structure is almost inherently partial and provisional. Social structures are not always obvious nor are they static objects. Thus, individuals require cues about these social structure, and these cues help guide action. Were there a complete correspondence between the cues given from social structure and the social structure itself, it might be easiest simply to do away with this extra layer of perception. But alas, social structure is a seductive object that necessarily resists exposing its full and complete self at any given time.

The cues that help individuals perceive and act upon social structure are referred to as social affordances. I explain how affordances have been used in psychology as well as sociology and new media studies. I present a model of action based on affordances and argue that this is a key step for linking action through media with action in face-to-face settings. I refer to habitual action, yet I acknowledge how action can be habitual on a person-by-person basis, rather than a one-size-fits-all schema. I argue that a multitude of media help facilitate differential access to alters. Chapter 3 follows up on this theoretical chapter with a brief list of specific operationalized questions based on this theory.

Chapter 4 is a description of the sample. This includes a brief discussion of the research area, discussion of the survey deployment process and a comparison of key demographic variables between the survey and recent Statistics Canada census data for East York. I explain the technique for eliciting and analyzing networks in detail, and give brief descriptive characteristics of the networks.

Following Chapter 4 are three substantive chapters about networking in everyday life using this data. Chapter 5 argues and demonstrates the existence of different internally consistent styles for networking in everyday life. I show the presence of six media use profiles as well as seven social activity profiles. These profiles highlight how affordances of different media work together to sustain a general pattern of acting towards one's social network. I reduce these six media use and seven social activity profiles to a single concept: events are arranged rather than spontaneous, and this arrangement is differentially understood by the individual depending on the type of activity and the individual's propensity to plan. Sometimes an individual is along for the ride. Sometimes an individual is participating in a regular and habitual event and other times an individual is singularly responsible for the shape of the vent (the participants, the venue, the duration, etc...). I use correspondence analysis to show both how media use is tied to various social activities as well as an individual's propensity to plan.

Despite the existence of consistent styles that are in some sense reducible to one's propensity to plan, there is still room for a great deal of variation within networks. In Chapter 6 I explore this variation. Therein I use the theory of networked individualism (Wellman, 2002) to motivate the discussion, as it is presently a well developed theory of media use and social networks. I explore the composition of networks by role and highlight how individuals conceive of certain kinds of roles as "group-like", while conceiving of other kinds of roles as individualistic. This affects not only the patterns of access with individuals of a certain role, but why those individuals are considered network members in the first place. But, networked individualism is not only a theory of roles, but of media use. In the second half of the chapter, I examine variation in media use across networks using a novel "particularity" score, demonstrating how individuals vary in their media use from being very particular (meaning they have a unique strategy for every different alter in the network) to very general

(meaning they use generally the same strategy with all network members). I model particularity using measures of social location, planning via media, network structure and network composition. I find that while particularity can be adequately modeled, it does not vary with network structure. Thus, I assert that networked individualism can work as a theory of networks, and a theory of networking, but that the two are more independent of each other than Wellman's theory would suggest. For example, as a theory of networks, it explains differences in the structures of contemporary relationships (that they may be more loosely-knit and far-flung). As a theory of networking, it is about connecting individuals on a person-to-person basis rather than on a place-to-place basis. Networking in a person-to-person way may lead to these loosely-knit and far-flung networks, but network structures do not *necessary* follow from networking practices. Connecting this point to the central thesis, it seems that new media have more of an effect on how we maintain our relationships than whom we consider alters worth maintaining.

Chapter 5 looked broadly at the individual, while Chapter 6 looked more specifically at the composition of the network. Chapter 7 goes into even more detail by looking at specific relationships within networks. Here I examine how one can explain the use of multiple ways for contacting a given network member. To use a point of contact, be it telephone, in person social activity, email, and so forth denotes an additional form of access. These forms of access are collections of different affordances (be it the ability to communicate with faraway individuals, link several individuals into a threaded discussion, and so forth). Presently, this increased access is considered to be related to the emotional closeness of the individual—the stronger the tie, the more points of contact / access. I address this theory and discuss how a pragmatic approach to access might better explain the use of multiple media in contexts such as everyday life.

The thesis concludes by reviewing the key themes addressed in the results chap-

ters. Broadly speaking, I suggest that media do not merely embed themselves into everyday life, but also change the rules for networking. They provide differential access to alters, rather than simply more access. This differential access is manifested through the use of specific affordances to manage social access. I demonstrate this at different levels of analysis: the level of individual habits, the network structure of an individual's relationships and the level of specific relationships. At each level, affordances allow for the fine-tuning of relationships, extra conveniences and contact that would have heretofore been overly expensive or complicated. But the story is only half positive. If there are now a multitude of points of contact for our personal networks, and each media has its own unique features or specialization, but their use is not broadly adopted, this means that while people may be more accessible than ever, the norms for access are also more complicated then ever. Do I phone or email? Should I check instant messenger first to see if he is available, or perhaps look on Facebook? Does he check his cell phone messages? If I do not have his number who can I call to find out? Is he normally awake at this hour? Indeed, this may lead to a situation of anomie (or normlessness).

Anomie has not been emphasized nearly as prominently as either isolation or "community". Consequently, I conclude this dissertation by taking on the prevailing academic discourse about media as socially isolating. I suggest that new media are almost by definition not socially isolating (they are *social* media after all). But that does not mean we can close the book on their social effects—for the sum total of their effects may be in how they refocus as well as complicate access to others. This is to say we may continue to be social *in spite* of the profusion of social technologies as much as, and because of, said technologies. By considering how media create a situation of differential accessibility as well as cut into pre-existing normative contexts (or behaviour settings), we can see how media make life more complicated ironically in the name of convenience. Yet, by articulating the specific contours of this differential accessibility

as well as some of the prominent features (or "affordances") of new media, one may infer possible ways of simplifying the ever-expanding media ecology and its role in networking.

Chapter 2

A social affordances theory of social networking

2.1 Introduction—The concept of networking

NETWORKING in everyday life is not necessarily an obvious concept. I have learned this in numerous conversations about my work, particularly at parties. People establish themselves by talking about their relation to the host and frequently asking "what do you do?", meaning employment. I mention that I study networking, and depending on the party I get one of two answers: "Like shaking hands and introductions?" or "So like Facebook?". At first I was a little bemused, as I had considered networking as a verb of social networks. That is, if I study how people maintain social networks, then surely I can say these people are networking, and thus, I am studying "networking".

Regardless of my intentions, the term networking has a certain cultural baggage. That said, the shift in response from "introductions" to "Facebook" highlights how this baggage is shifting as the term enters a sort of new cultural niche. I had neither of these terms in mind when considering this topic. Since I am swimming against the current of popular understanding of the term, it may be helpful to illustrate some popular notions of networking if only to differentiate them from a proposed definition.

Networking as a term is most prominently found in popular (or pop) business lit-

erature. I recently found a apt representative of this genre at an airport bookstore. Alongside other business titles was *The Little Black Book of Connections* by Jeffrey Gitomer, a bestselling author of introductory business books. The book's subtitle is "6.5 assets for Networking Your Way to RICH Relationships [sic]." Inside its embossed cloth cover is an ode to the usefulness of business relationships. As a popular book, it makes no mention of social capital, refers only to reciprocity as "the golden rule" and focuses on how to translate relationships into personal success. Despite its over-the-top design, most of the points in this book neatly capture the conventional view of networking. First, that it is dyadic—one connects to other people (Chapters one and six of his book). Second, that it is about making a good first impression (Chapter six). Third, it takes place at events (Chapter four). Most importantly, however, it is instrumental and goal-oriented (Chapter two). Consider one of Gitomer's "universal truths of networking": "Before you can GET what you want, you have to KNOW what you want, and make a GAME PLAN to get it" (Gitomer, 2006, 56). It is not hard to see how this instrumentally focused networking ideology is considered boorish outside business circles. It presumes a superficial rational actor who easily merges their personal identity with the need to do business. This is the sort of actor who, with little sense of the prevailing social structure, juts out his hand at any possibly opportune time in order to get a return on his social investment.

Increasing in sophistication from Gitomer's popular books are works such as *Personal Networking* by consultant Mick Cope (2003) and *Networking Smart* by sociologist Wayne Baker (1994). Like Gitomer's work, they are still oriented towards business, but unlike Gitomer they offer a rich sense of social capital, and particularly in Baker's case, considerations of social structure. What unifies these books beyond the word business on the upper left corner of the back cover is their pro-relationship tone. They couple relationships with success; build relationships, build success.

While this term for network still abounds, there is a competing understanding of

networking via social software. The data in this study predate any significant impact of social software by about two years, but given its present prominence (and congruence with the overall argument) it is still worth mentioning. These sites allow individuals to grow a list of friends by either searching for specific names or getting invited by other friends. This list becomes a sort of context for information sharing. People post pictures that their friends can view, as well as play games and send messages. Being a friend means one has access to party invitations, personal life updates, pictures, and the friend's list of friends. These sites are frequently referred to as "social networking sites" (boyd and Ellison, 2007) as they use the idea of a network in order to link people. That is, one is networking on this site by maintaining a friend list and gathering new ties.

In the past couple years, these sites have quickly diffused through the population. Rather than being the mere toy of the technologically sophisticated, they are now a part of everyday life for millions of individuals.[1] They are mentioned in media reports, embedded in popular discourse and for large segments of the population, are an assumed part of communicating in everyday life.[2] As of June 2008, Facebook lists 1,200,000 members on their site from Toronto, which means one in every four people in the city is participating.

Networking in everyday life shares a number of features with these earlier concepts: it involves connections with a set of individuals (whether or not these individuals are neatly enumerated as they are on Facebook), there are contexts for action and there are undoubtedly benefits from specific alters, usually considered as social capital. But rather than considering networking in everyday life as a single concept that stands alongside these other two, I consider all three as social network-oriented

[1] As the data for this study comes from Toronto, Canada, it is worth noting that for many months in 2007, Toronto was the world Facebook capital, having the most users in both absolute and per capita statistics.

[2] Facebook claims that they are ceasing to distribute these statistics in the summer of 2008. However, as of writing they are still available at <http://www.facebook.com/networks/?nk=67108974>

forms of social action. Networking then is the *active process of building, maintaining, and sustaining a specific set of mutually regarded relationships.*

In this broad definition networking, then, is a specific form of social action. So while networking in this sense may be a foreign term to everyday discourse, it is a long-term citizen of sociological theory—as structure and agency. As such, I can make use of prior work on structure and agency in order to understand this phenomenon.

In the following pages, I elaborate on a theory of structure and agency that is aligned to the consideration maintaining ties in everyday life. I review the concept of social action and elaborate on a specific notion of agency from Emirbayer and Mische's "relational pragmatism". While I settle on their concept of agency, I refocus it towards a decidedly phenomenological approach to structure. By this I mean, I consider structure as mediated by the perceptions in lived experience. I introduce the concept of affordances to illustrate how individuals do not act on structure *per se*, but on perceived properties of the environment that serve as an "access point" to structure. This shift to interfacing with affordances rather than interacting with structure allows me to discuss the novel ways that media, and especially new media, can alter our sense of social structure and our capacity to interact with it.

For example, networking on Facebook does not occur in a specific place or time. Rather one can network at any time from anywhere with an Internet connection. However, who they network with is regulated by the specific friendship mechanisms set up on this site. In what ways are people accessible to each other via Facebook, and how is this different from other ways individuals are accessible? One can replace Facebook with virtually any other media and ask the same question, insofar as each medium is a means for accessing one's personal network.

This sets up a series of questions about the logic of networking. I contend that individuals are moving from a logic of networking based on specific space-time constraints to a logic based on access through affordances. That is, we are moving from a

logic of shared norms about the right spaces at the right times, to individualized perceptions of social structure based on the affordances of the media one uses. Granted, it has always been possible to consider affordances rather than objective features of contexts and media. However, when everyone adheres to similar perceptions of social structure (a normative view of social structure), it is not as relevant to consider affordances, since it is assumed that individuals are interpreting the time and space coordinates of social structure in a more or less similar manner. However, the current profusion of different ways in which one can perceive and access one's alters means that individuals will routinely pay attention to different ways of understanding who in their network is available and who is going to be available in the future. It is a shift from asking about how "we" network at events to how "I" network with "my" alters. This is precisely the shift in the common understanding of networking alluded to above.

I will return to this theme again in the concluding chapter. After having reviewed several logics of networking in everyday life, I reiterate that social life is moving from a focus on space-time social constraints to affordance-based social access. There I discuss the implications of this conclusion for the fragmentation of social life, potential power struggles in the family and the network, and a shift in the way social capital is generated—from bowling alone to networking together.

2.2 Considering structure and agency

Structure and agency have a long history in sociology, and one that I can scarcely do justice to in a single chapter. Nevertheless, any discussion of social action necessitates such an attempt.

In classical sociological work on structure and agency, thinkers would often emphasize the causal primacy of one over the other. For example, Durkheim was fond

of demonstrating how social structures constrain personal action. His emphasis on distinguishing sacred and profane sites implies an emphasis on how these sites structure and thereby constrain social action in various forms. Action at a sacred site was oriented towards the group or social whole, while action at a profane site could be oriented towards the individual (Durkheim, 1915). Durkheim did not focus only on material sites, however. Mere ideas could constrain action as social facts. Consider this claim about social facts.

> A social fact is every way of acting, fixed or not, capable of exercising on the individual an influence, or an external constraint; or again, every way of acting which is general throughout a given society, while at the same time existing in its own right independent of its individual manifestations (Durkheim, 1982, 10).

For him, like many positivists in his wake, sociology is the study of these structures; our task is to illuminate these abstract forces so that we may better understand how such constraints affect behaviour.

In contrast to Durkheim's structuralist point of view is Weber. Where Durkheim focused on the role of structures, Weber sought to illustrate how one's understanding of social contexts would lead to different forms of action. Weber emphasized *Verhesten*, or empathic understanding. Where Durkheim fleshed out the concept of structure, Weber fleshed out a concept of action. Specifically, he articulated a typology of action, whereby acts are either goal-oriented (*zweckrational*), value-oriented (*wertrational*), traditional or affective (Weber, 1997). Where Durkheim saw society as moving towards increased integration through functional differentiation, Weber pessimistically saw society shifting from value, traditional, and affective action towards goal oriented action (Giddens, 1973).

Subsequent authors have sought to harmonize these competing positions, by focusing on what is now considered "structure and agency". The terminology was first

given shape by Parsons (1967) and has been elaborated upon by numerous social thinkers. Contemporary syntheses, such as those offered by Giddens' structuration approach (1984) or Archer's morphogenic approach (1995) generally consider structure and agency to be mutually constitutive. Structure constrains action, but in acting individuals modify structure which is then presented anew to the actor, *ad infinitum*.

Recent work on structure and agency has been able to focus on one or other, rather than merely theorizing about the two in tandem. One such effort is the relational pragmatist approach to agency (Emirbayer and Mische, 1998). It is considered relational as it seeks to embed the concept of social networks (or more broadly social relations) into the dichotomy of structure and agency. That is, structure is not merely an omnipresent and diffuse force exerting pressure on ego, but a series of structured connections between individuals that are sustained through time and space. It is pragmatist in that the conception of action in this theory comes from pragmatist thinking on action. This does not refer to 'practical' thinking, but to the pragmatist school of philosophy starting with C. S. Peirce (Peirce, 1878). It has been updated through recent advances in cognitive science and psychology, but the main premise remains intact—individuals have coherent habits for action, and generally adhere to these habits as long as they work sufficiently. When problems arise, individuals will renegotiate their habits and often work creatively to resolve this problem. This new solution is fed back into the series of habits for daily life. This definition of pragmatism is eloquently expressed by Joas:

> The typical pragmatist schema anchors doubt in action, which is conceived in terms of a model of periodically recurring phases. According to this model, all perception of the world and all action in the world is anchored in an unreflected belief in self-evident given facts and successful habits. However, this belief, and the routines of action based upon it, are repeatedly shattered; what has previously been a habitual, apparently automatic

> procedure of action is interrupted. The world reveals itself to have shattered our unreflected expectations; our habitual actions meet with resistance from the world and rebound back on us. This is the phase of real doubt. And the only way out of this phase is a reconstruction of the interrupted context. Our perception must come to terms with new or different aspects of reality...the pragmatists therefore maintain that all human action is caught in the tension between unreflected habitual action and acts of creativity (Joas, 1996, 128-129).

Thus, without dwelling on whether structure and agency are mutually constitutive (as Giddens suggests) or merely a duality (as Archer suggests), the pragmatist approach captures the cyclical feedback loop of structure and agency as well as a distinction between creative action and habitual action. This seems very much aligned with the "cultural tool-box" model proposed by Swidler (1986). She argues that culture should be seen as a series of "strategies for action" rather than a set of ultimate goals or underlying values. Swidler does not make explicit use of pragmatism in her article, although I believe this to be an innocent rather than deliberate omission. Moreover, this link is made explicit by Emirbayer and Mische who note the similarities between her position and others in this domain (1998, 981).

Beyond a review of other's work, Emirbayer and Mische's contribution to this standard pragmatist framework is to systematize the deliberative process involved in these habitual decisions. This deliberative process has a specific logic. To articulate this logic they situate the deliberative process in relation to its temporal and relational context. For them agency is defined as:

> [T]he temporally constructed engagement by actors of different structural environments—the temporal-relational contexts of action—which, through the interplay of habit, imagination, and judgment, both reproduces and transforms those structures in interactive response to the problems posed

by changing historical situations (1998, 970).

This chapter, and this dissertation more broadly, extends their formulation of this deliberative process by considering what it is the individual deliberates on in particular. For Emirbayer and Mische, one deliberates on the "the temporal-relational contexts for action" that constitute structure. Following Parsons and Shils (1951), they disaggregate these structures into the 'cultural context', the 'social-structural context' (referring to the pattern of network ties) and the 'social-psychological context' (referring to durable psychic structures of attachment and emotional solidarity).

While it is reasonable to consider that individuals iteratively act based on changing contexts (be they cultural, social-structural or social-psychological), what is missing from this definition, and most considerations of structure and agency, is how individuals perceive this structure in the first place. I assert that there is an interpretive film that mediates the external conditions and the internal states of mind deliberating on these conditions. That is, these external conditions are not immediately given to the actors but rather are mediated by a series of cues. Most people see buildings and favours, not institutions and networks, at least not explicitly.[3] Giddens offers one example of this interpretive film as 'access points' (1990). An access point like a flight attendant helps individuals mediate the abstract system of the airline industry. For Giddens, modernity necessarily entails the presence of such access points as they facilitate the interaction between a lay populace and the variety of overly complex institutions. Scholars of culture also acknowledge this distinction between the external conditions and the cues that are given to the individual. This is the foundation of the field of semiotics. As a study of sign systems in culture, semiotics takes the distinction between the signifier (the cue) and the signified (the external reference connoted by the signifier) as foundational (Barthes, 1973). Yet, access points are too narrow, as they

[3]In fairness, I refer here to the untrained eye. By contrast, sociologists are committed to articulating and giving shape to these external social forces.

imply specific human representatives, while semiotics is insufficient as it is not tied to the concept of social action, only cultural awareness. Fortunately, in between these two extremes (only humans / only signs) is the concept of affordances from ecological psychology.[4]

2.3 Affordances from ecological psychology

As a subdiscipline of psychology, ecological psychology focuses on the mutual interaction of animal and environment, rather than on isolated stimulus response patterns. One of the major thinkers in this field is James Gibson.[5] His work focuses on how individuals (or animals) can perceive features of the environment *in situ*. This is in stark contrast to prior psychological theories of visual perception that took the retinal image as start of an analysis. Where prior behaviourist work focused on how certain images could elicit specific stimuli or project a specific two-dimensional image for the actor, Gibson asked how actors could intuit the functional significance of objects from their properties—as understood by the actor. That is, how could an actor mediate between an objective external environment and subjective internal representations. There are notable parallels here for a sociology of networking. That is, how do individuals intuit the functional significance of contexts and media that enable them to maintain a sense of connection with others.

Many of Gibson's theories are specific to the visual field (such as the ambient array). However, one concept is particularly germane for this analysis—namely the

[4]Ecological psychology here refers more to the Gibson school of ecological psychology relating perception and action. This can be contrasted with Barker's ecological psychology (which has heretofore received more attention from sociologists). As Heft notes, to distinguish between these two schools, scholars now refer to Barker's school as ecobehavioural science (Heft, 2001).

[5]While Gibson may not be a household name for sociologists, three of his books ranked in the top 50 most important works in cognitive science as ranked by the Center for Cognitive Sciences at the University of Minnesota <http://www.cogsci.umn.edu/OLD/calendar/past_events/millennium/final.html>.

concept of affordances. For Gibson,

> An affordance is the perceived functional significance of an object, event, or place for an individual. For example, a firm, obstacle-free ground surface is perceivable as a surface on which one can walk. In contrast, a boggy surface or a surface cluttered with obstacles (e.g., a boulder field) is typically perceived as impeding walking (Heft, 2001, 123).

Affordances have a complex if active history within ecological psychology and beyond. They have stimulated numerous experimental articles on the perception of walking surfaces (Gibson, 1986; Warren and Whang, 1987; Norman, 1990) as well as theoretical articles indicating the relevance of the environment for psychological studies (Gaver, 1996; Heft, 2001; Baron, 2007). But perhaps the most significant contribution of the concept of affordances is its ability to mediate objective/subjective distinctions by way of a relational theory of knowledge. As Schmidt states:

> Affordances are neither subjective nor objective but defined in a way to make the subjective/objective distinction irrelevant. Speaking more plainly, meanings exist not inside my head (in the form of mental representations) but emerge from my relations to the environmental facts and exist outside my head in this relationship. As a theory of meaning, affordances then are both relational and extensional (as opposed to representational and intensional) (Schmidt, 2007, 138).

For example, Gibson asserts that individuals understand the function of stairs without having climbed them. Not merely because they look like other stairs, but because they look like a set of places to put one's feet as one moves up an incline (Gibson, 1986). Stairs have a perceptual "climb-uponness". Yet this climb-uponness is intersubjective. If the individual is either too short or too tall, they may not perceive the stairs as such, or perceive them as stairs for someone of their height (Heft, 2001).

By making this link between the external environment and internal states of mind, affordances offer a key and underrecognized link in a theory of structure and agency. Affordances are the favours and buildings that we recognize rather than the networks and institutions that we infer. They give shape to the distinction between external givens and internal states of mind by focusing on the intersubjective cues from the environment. As mentioned above, this is a supremely *relational* concept of being-in-the-world. This concept can compliment Emirbayer and Mische's relational pragmatism, even if they had not noticed it as such. It reorients a discussion of networking toward the perceptual givens of one's social network.

Such a reorientation towards affordances and away from explicit discussions of structure also helps me focus on the specific aspects of social networks that are salient in networking. Later in this dissertation, I will display a series of social network diagrams, illustrating the relationships between individuals in a person's network. I will also discuss this network as an object (such as "how large is a person's network"). However, the network as sociogram is not what individuals act upon. It is rarely ever even given to individuals in such a fashion. Rather, individuals are given perceptual cues about their network, such as a list of phone numbers or a photo album. In lieu of the concept of affordances, one might be tempted to reify specific empirical social networks rather than look to the situated cues actually used by individuals. But if I may paraphrase a well-worn Kōan: If a network is drawn in a lab and no one is around to see it, does it make a difference for action?

This is not to deny the relevance or utility of social networks as artifacts, particularly the illustrative sociograms that often stand in for the network. They are useful to those who see them. For academics they serve as data and perceptual cues to a specific social structure for analysis. It is to suggest that a discussion of *networking* rather than *networks* hinges on an understanding of the distinction between the social network as external object, and the perceptual cues from an individual's social environment that

help the individual notice and interact with this social network.

2.4 From affordances to social affordances

Gibson never wrote about social interaction as a structured environment. His work focused primarily on the visual field. However, in his wake, numerous scholars have extended his theory to consider *social affordances* as a specific class of a more general concept.

Social affordances have an interesting and clearly bifurcated life in academic thought. To ecological psychologists, social affordances generally refer to the perceptual cues given by other people to which the individual reacts. Thus, if parent gives a frown, this is a social cue that the parent is unhappy and the child should adjust what he says to the parent if he wants her to cheer up. One application of this research has been to consider how individuals with autism-spectrum conditions miss these cues thus leading to awkward and sometimes difficult social situations (Loveland, 1991).

Veering off from the ecological psychologists are designers and theorists in human-computer interaction, such as Gaver (1996) and Bradner et al. (1999). Their use of social affordances did not weigh as heavily on the idea that affordances need to be perceived so much as they are merely capabilities of the system. Thus, to 'afford' social activity referred to 'making that activity possible' rather than perceiving some relationship between the environment and the subject. While Bradner et al. admit this is the case, they also acknowledge that their use of the term is provisional, and could benefit from elaboration.

Social affordances have since been picked up by Wellman and colleagues as 'features' more than 'perceptual cues'. Affordances in this tone are referenced in Wellman et al. (2003; 2004; 2006), as well as the work of Boase et al. (2006). As coauthor on two of these papers, I was also a participant in reinforcing this particular meaning of

the term. To be fair, affordances were still used in this work under a specific logic, although not one hinging on the subject-object relationship (directly). Rather, affordances became a way to work between a deterministic logic of technology, namely that technology shapes interaction (Katz and Aakhus, 2002; Marx and Smith, 1994), and a constructivist logic that technology is purely a cultural construct (Latour, 2007). By suggesting that a technology *affords* social action, Wellman et al. present a non-deterministic way out of these two polar interpretations of technology use. For example, in a paper titled "The Social Affordances of the Internet for Networked Individualism", Wellman and a host of colleagues refer to many of the changes of the Internet that they posit might make a difference to how it is used. Yet the only definition of affordances therein is:

> A set of current and imminent changes creates possibilities—social affordances—for how the Internet can influence everyday life (2003).[6]

Here one can see how social affordances stand in for changes that can, but not necessarily, lead to changes in 'everyday life'.

Interestingly, Wellman's interpretation of affordances is a fair deduction from the original definition. By positing affordances as the intersubjective perceptual cues that mediate social structure and individual deliberation, then one can take Wellman's interpretation as a corollary, since affordances are neither deterministic (they require recognition as cues) nor are they entirely culturally constructed (as they are tethered to external social and technological conditions). This means that affordances, as covered under the original definition, would still be covered under Wellman's definition. Yet the converse is not true: not everything that creates a possibility for altering interaction is an affordance. Many of these things are objective external conditions. For example, in the aforementioned Wellman article, the authors mention "greater band-

[6]Before 2006 the *Journal of Computer-Mediated Communication* did not use page numbers as it was online only.

width" as an affordance of the Internet. In conformity with his definition, individuals may take advantage of the greater bandwidth or not. However, this is an objective condition. The affordances that emerge as a consequence might be "streaming video", "pictures embedded in emails" and so forth.

One challenge with this definition which is picked up by Gaver (1996) is whether affordances have to be perceived or simply make a functional difference. That is, if there are many wonderful features of email that are unused by most individuals, can I still consider them affordances of the system? Or if people only ever use a mobile phone in the house can I still say it has the affordances of a mobile phone? Here I depart with Gaver, as he suggests that it is their functionality rather than their perceivability that makes a difference. By privileging function over perceivability one regresses into structural-functionalist (or even technological determinist) thinking and ignores the main reason for considering these features as affordances in the first place, namely their intersubjective link between structure and agency. It is not important that everyone perceive certain features of media. Rather, one can ask who perceives certain features and do these features make a difference to networking. Indeed, this is the focus of Chapter 5.

Perhaps one of the reasons why social affordances have led this double life (in ecological psychology and social informatics) is because of the difficulty in establishing the external conditions of social life that give rise to these perceptual cues; it is really difficult to say what exactly social structure is, and moreover, what it is to the individual rather than what it is in the sense of macroscopic forces like nation states. Gibson's affordances are visual, thus implying that the external referent (such as climbable stairs) is easy to see. By contrast the external social structure is more difficult to indicate. So for psychologists it becomes the clear facial expressions of other individuals and for new media designers it becomes the tangible features of a particular system. However, as a sociologist, I have been trained to consider the external social structure

as ontologically distinct. In fact, as mentioned in the beginning of this chapter, part of the core of sociology's programme is to demarcate social structure and to isolate its effects on the individual. However, unlike facial expressions or a set of buttons on a software application, social structure is not so easy to point to.

In the absence of 'the social structure' are myriad forms of 'a social structure'. Most notably are the network diagrams of social network analysis. These diagrams serve as a sort of focal point for social network analysis. As Freeman muses in his history of the field, they are one of four defining features of social network analysis (2004). Exposure to these diagrams is an evocative experience (although admittedly less so nowadays given their profusion in popular culture). They can show relationships between individuals, the core members of a group, whether there is one main group or many, and a host of other revealing details. By attaching attribute data to the nodes they can reveal even more features—but the same fundamental property exists—diagrams seem to show social structure.

However, most sociologists would readily admit that even the intricate details of social network diagrams are an insufficient means for viewing social structure. These diagrams show individuals as nodes and relations as lines. But relations can be multiplex (read: more than one type), can be of differing strengths, can be negative as well as positive and so forth (see Fischer, 1982; Wasserman and Faust, 1994. But also, (and this is key) relations are activated at different times, in different contexts and under different circumstances. Thus, the social structure is a multidimensional construct that under even the most ideal circumstances cannot readily be distilled into a tidy sociogram. Moreover, as stated earlier, sociograms are not the ways that individuals perceive structure in the first place. Individuals can perceive social structure through a host of cues. Address books, photo albums, clocks, and calendars denote social structure (Latour, 2007). So, for example, one may consider Durkheim's markers of sacred sites (such as totems) as social affordances as they denote shared places and

help to indicate which territories are revered by the group (Durkheim, 1915). But one can also consider the list of important telephone numbers stored in one's mobile as an affordance of social structure, as it is a way of perceiving a list of relevant individuals and acting upon this list (by calling certain people).

A list of social affordances can go on forever without actually pinning down a specific definition. Thus at this point, I posit that social affordances are *the perceptual cues that connote aspects of social structure to individuals thereby creating a functional difference for the individual*. This is much like Gibson's formulation that visual affordances connote aspects of the physical environment that create a functional difference for the actor. One difference, however, is that in Gibson's definition, the function of the object is inferred directly. I see something that affords sitting and I can infer the function - to sit. Social affordances are a little more slippery [sic]. This is because the objective social world that individuals act upon is not immediately given. The social world itself is always inferred by individuals. We do not know exactly who our friend's friends are, but we have cues that usually give us a pretty good idea. Moreover, many aspects of social life are necessarily fuzzy. We do not know exactly what the institution of marriage looks like (it usually is between a man and a woman, it usually involves rings and a transition rite and it usually is a legally binding contract, but it many involve none of these things in certain contexts). We do not know whether private time is unambiguously private or mostly private except to specific individuals. Whereas objects in the visual field are physical and often deterministic, social life is often non-determined and governed by habitual norms. Thus, where affordances are the perceived functional significance, social affordances are necessarily a less rigid version—cues that connote social structure in such a way that individuals can act on this social structure differently.

As an aside and possible clarification, a perceptual cue that does not make a difference for action is not an affordance. Having a blue background for one's computer

screen versus a green one is not an affordance. However, if the background also gives a real-time update of the number of email messages in one's inbox, that would be an affordance. The real-time update would be a new way to perceive social relations (i.e., knowing that certain people are trying to contact the individual), and create a functional difference (i.e., knowing that there are new messages is the first step to checking and potentially responding to these messages).

To be clear, this is not a functionalist theory of social action. It does not suggest that there is a necessity to certain social structures, or that certain structures fit a specified niche, nor that they continually work towards differentiation in society, although all of these claims *may* be true about specific structures. It is an ecological theory of social structure in that it proposes a specific link between an individual and her social environment. It considers the individual as an ever-active agent who by necessity interacts with selected parts of the environment (Luhmann, 1995; White, 2008; Heft, 2001). Much like how affordances are the visual cues as to how to act with the spatial environment, social affordances are the perceptual cues that help an individual select a specific part of social structure to interact with.

This definition of social affordances works alongside the pragmatist theory of action mentioned earlier. For the most part, social affordances are stable and pre-given to the individual in any given situation. However, at certain times, individuals may find that the social structure as perceived does not meet their needs. Perhaps they miss an important call, feel overwhelmed by the volume of email, are distressed by work encroaching on home life, or want to find a fun new way to socialize with friends. At such times there is a disjunction between what individuals expect of social structure as given by affordances and what is possible given particular affordances. At these times individuals can creatively act to reassess either their expectations, the affordances available to them or the external social conditions. To the extent that modifications are possible, they are fed back into the social structure, the affordances or

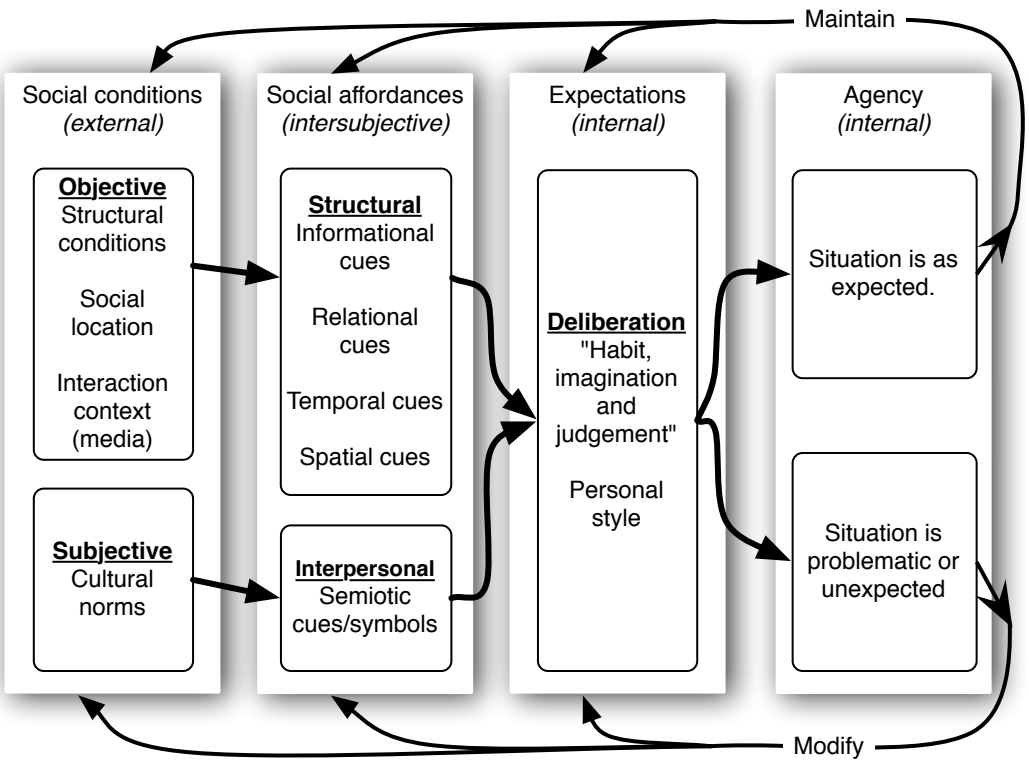

Figure 2.1: Feedback loop of structure and agency

one's expectations, and the cycle of habitual action begins anew.

Figure 2.1 features this feedback loop from external social conditions to affordances to internal deliberations and finally agency. This is a stylized graphic. While it features many relevant dimensions of external social conditions (information, relations, space, time, and culture) it is beyond the scope of this chapter to assess whether this is a pure and complete categorization of all possible external conditions. Rather, these are some of the key elements of the external social structure that individuals act on. More importantly, due to changes in historical circumstances, urban planning and especially for this dissertation—media use—information, relation, space, time, and culture are the elements of the external social structure (and the affordances that represent these structures) that are undergoing the most significant transformations. The remainder of this chapter will elaborate on these external social conditions and their relation-

ship to media social affordances. [7] The subsequent chapters will tackle most of the third column in this graphic by examining the deliberative process (i.e. what do these habits look like and how are they related to the external world). In many ways however, the examples provided later on do not verify this graphic so much as illustrate it empirically. For example, by demonstrating how certain media use habits are tied to certain social activity profiles, I illustrate the relationship between external social conditions (as constrained via social activities), social affordances of the media used to coordinate these activities, the sense that individuals habitually engage in these activities and why individuals adopt new technologies (in order to maintain accessibility through these various interactions).

2.5 A provisional typology of affordances

Before discussing the shift brought on by media use, I will take some time to illustrate some of the key concrete affordances of new media, which I have categorized into four specific groups: the social affordances of time, space, relations, and information. As stated above, this should not stand as the last word on these affordances, nor will this be the last typology.[8] Rather, it is merely a conceptual framework to assist me in making sense of the styles and logics of networking, and their possible changes.

[7] Throughout this dissertation, I have wrestled with the question of whether or not informational affordances are different from semiotic cues or should be considered the same. I have ultimately decided to consider semiotics as a separate dimension. This is only provisional but worth clarifying. Informational cues refer to the content of any given interaction. This is different from its cultural meaning, and related perhaps more closely to the information theory concept of 'signal'. How much information can one receive from someone else is different from how that information is understood in relation to larger structures of meaning. These larger cultural structures are subsumed here under culture and semiotics, while the content is subsumed under informational affordances. For example, how much information can be gleaned from a newspaper is different from how to interpret the stories in relation to other geopolitical events.

[8] Nor is it the first. This typology shows some similarities to the affordance typology of Zhang and Patel (2006). They parsed affordances into biological, physical, perceptual (mapped) and cognitive. My typology is more restricted and social-oriented.

2.5.1 Informational affordances

Some social affordances enable individuals to intuit specific information about the social setting. These are the sorts of affordances often referred to in ecological psychology literature on social affordances. This sort of social affordance might include facial gestures, intonation, gifts, and other symbols of how individuals seek to indicate the state of the relationship between each other. These affordances are the socially-relevant content of the interaction, and are the most closely aligned with cultural signs and symbols.

These sorts of affordances are frequently discussed in media use studies, even if they are not referred to as such. The earliest example is probably McLuhan's "hot" and "cool" media distinction (McLuhan, 1963). For him, all media afforded a particular relationship to data. The cinema, with its panoramic screen is a hot medium. By contrast, the television is a cool medium, better suited to static sets and cartoons. This line of thought was continued in media richness theory (Daft, Lengel, and Trevino, 1987). According to this theory, some media are better able to communicate data than others. Letters would be the least rich, while in-person contact is the richest. This theory has largely been discredited as normatively privileging in-person contact, while undermining the written word (Wellman and Hogan, 2004). However, critics rarely tackle the objective ranking of how much information is possible to transmit along any given media. Instead they focus on the fact that such an ordering ignores many other relevant facts about the media, such as relationship history as well as the obvious conveniences of media over in-person contact. For example, telephone calls are convenient for contact between distant locations, while email can be sent at any time of the day. However, if one focuses solely on the information content, it is not hard to appreciate the original intuitions of media richness theory while admitting it is partial because of all of the other sorts of affordances it misses.

Informational affordances highlight the distinction between the possible informa-

tion that can be given to the individual and the actual representation of the information as given. To act on an informational affordance is to act on the representation that is given in a way that conforms to one's expectation of what that information means. In social terms, a wall calendar affords information to whomever is in the room. The objective information may be terse (like someone writing "Fido 2:30" on a calendar, meaning the veterinary appointment at that time), but it provides a cue as to when events are taking place. Furthermore, this example highlights how a single act (writing on a calendar) exists at a nexus of affordances—it shows a relation, a place, a time and the purpose. But the example also shows how the volume of information can vary. If that calendar was online it might have additional features that provide additional information. For example, clicking on "Fido 2:30" might take the user to the vet's homepage or to a larger "event" page with directions, notes (such as a description of the trip's purpose, or a note to also pick up dog food). Hence the online calendar gives more information, that is, more perceptual cues for action. Is the online calendar therefore better? No. Some may perceive it as overkill, others will find it too complicated and others still will prefer to have this information in a shared location like a kitchen rather than in a private location like a personal computer. The goal here is not primarily normative (as if I were a salesperson for online software). The goal is to suggest that different media present information differently to individuals, and therefore present differential cues for action.

2.5.2 Relational affordances

Apart from the specific information that is transmitted socially, are the perceivable cues about the relationship available in any specific medium or social context. These cues may be semiotic in nature (such as cues about status, role, relationship history), or they may be structural. What distinguishes them from informational affordances is that they are oriented towards other participants rather than the content of the inter-

action or context.

If one is at a basketball game, informational affordances present cues such as who is winning and how much time is left. Relational affordances, by contrast, indicate who is the coach, the point guard or referee. Where informational affordances refer to content, relational affordances refer to specific roles. These kinds of affordances work well with the classic notion of a behavior setting from ecobehavioral science (itself a form of environmental psychology). Ecobehavioral science starts from the premise that one may learn more about a person's behavior from the setting than from the individual's psychological make-up. Settings are well codified contexts with a space-time locus, and a series of roles that define functional unfolding of events. A lecture is a behavior setting, with pupils and lecturer. It does not require a specific pupil or specific lecturer, although it does require people to fill these specific roles. The same can be said for a basketball game or even a trip to the pharmacist.

Meeting someone at a party indicates a different relationship and a different interaction than meeting them at one's house. Even if it is the very same house, for the fact that the people and the 'behaviour setting' have changed (Barker, 1968; Wicker, 1979). Both settings give perceptual cues, such as who is the host, who is a frequent talker or well connected. These sorts of interactions may appear obvious, but imagine if life was conducted via telephone—all these perceptions of social structure would be absent, since only dyadic connections (and the occasional three-way call) would be available to the individual, and the passive cues about who else is talking to whom would be absent. Such passive cues of relational structure may be one of the key benefits of conferences—who attends who else's lectures, or is seen in the hall together. By perceiving these cues about different relationships academics get to learn about potential collaborators, third parties, reviewers, etc...

Relational social affordances are undergoing significant flux in the last few years due to digital technology. People may think first of how email, cell phones, instant

messenger and social software alter the user's relationship to time and space (hence the pronouncements of the 'death of distance' (Cairncross, 1997), or Ling's concept of the softening of time (Ling, 2004). Yet these media also include novel ways of perceiving relationships between individuals. These sorts of affordances are one of the cornerstones of Wellman's Networked Individualism. Therein, he refers to a long-term societal shift from door-to-door interaction, to place-to-place interaction and finally person-to-person interaction (Wellman, 2001b). This shift not only refers to a difference in the spatial conditions, but in the relational conditions. Place-to-place refers to the fact that telephones and letter mail facilitate contact between houses and offices. I may pick up my spouse's mail, while my spouse may answer a phone call for me. Thus I can perceive who is sending letters to my spouse and vice versa.

Person-to-person networking implies a different set of ways for perceiving ties between individuals, and different, personalized, ways of interacting with these individuals. For example, email offers a relational affordance of being able to send directly to specific individuals with the understanding that the email is for that particular person or set of persons. What we perceive in email addresses are either broad groups of individuals (mailing lists) or specific lists of individuals for whom a message is distinctly targeted. Email offers two modes for this sort of behaviour—carbon copy and blind carbon copy. To receive a carbon copy (cc) message is to also receive the cue that this message is not necessarily for you directly, but that the sender wanted to bring it to your attention. Blind carbon copy (bcc) means that other recipients are not aware that you have been sent a message. Bcc'd messages are rarely used, but are often considered a sensible and common strategy for inviting people to a party (ironically, this is where one seeks to undermine a relational affordance of email by intentionally inhibiting the perception of who else is, or may, attend). Since affordances are acted upon, in this case one acts upon the perception of being invited by a specific individual, not the perception of who else is attending.

Instant messenger also has unique relational affordances, most notably that of the status indicator. When one signs in to an instant messenger client, this information is sent to a specially tailored list of individuals. This list is told that the person has just "come online" and is therefore available for chatting. All of the major instant messaging clients (descendants of the all-but-abandoned ICQ instant messaging client) allow individuals to have varying status, generally either stating that the individual is available or present-but-busy. However, they also vary in who gets this message. On Microsoft's platform (the dominant one in Canada), one must be on a person's list to see their status and whether or not they are online. On Yahoo's platform (one of the dominant ones in the US), anyone can view a person's online status, but they still need to be on the list in order to chat. Finally, an emerging client, Google's "GTalk", allows anyone to view anyone else's status as long as they were specifically added *or* the two had an email conversation. This latter strategy fits between Yahoo's "all public" and Microsoft's "only specific friends" techniques in typical Google style (which is to say it is a smart strategy, but done by algorithms rather than humans).

Relational social affordances are so much an obvious part of participating in behaviour settings that it is easy to forget how complicated they really are, and the sort of trouble new media designers are having replicating relational affordances in the absence of settings. The fact that I can be in a room with a celebrity, but never get to walk up and talk to them, or that certain people always sit near each other in church are perceptual cues for how to act in these settings. Yet, when one moves from behaviour settings where roles are neatly prescribed and tied to context towards mediated communication outside of behaviour settings, it become clear that media only do a reasonable job. Instant messenger tells people when they are available or busy, but not who else they are talking to. Newer email systems autocomplete email addresses (thereby indicating a prior history), but they are still abysmal at providing smart recommendations of who else to send a message to (Fisher, 2004). Similarly, it

is far easier to tell if someone is occupied when knocking on their door than when calling them on the telephone. The present challenge for the designers of these systems is described as "seamlessly integrated contextual awareness" (Bolchini, Curino, Quintarelli, Schreiber, and Tanca, 2007). Indeed, this is not particularly problematic in everyday life. The spatial affordances of a particular setting as one shifts from place to place offer a seamless transitional experience and also an awareness of context. Media do not yet offer the same features, and nowhere is this more apparent than in relational social affordances. I return to relational affordances again when operationalizing the core questions of this thesis, as they are probably the most significant way in which one can differentiate who is accessible from who is close (or demonstrate how poorly media do at differentiating who is accessible from who is close).

2.5.3 Temporal affordances

Kant considered time one of the two transcendental constants (space being the other). It exists outside of human affairs, uncontrollable and ever-present. We now know that time is not necessarily constant in very macro (read: interstellar) settings, but on the human scale it marches on with a reasonably consistent beat. But time is not gravity, dark matter, or electrons. It is not merely an abstract building block of existence. It permeates everyday affairs; it is felt. Its rhythms guide social behaviour, and its measurement has facilitated global synchronization via clock time.

Time as we know it is a social artifact. It is "5:18" and "next week sometime". It is easy to see how one can have temporal social affordances. These are the perceptual cues about temporality. And not merely through their rhythmic structure of time and date, but also through their marker of shared events and occasions (Zerubavel, 1982). Calendars remind us of special occasions such as Father's Day and Christmas.[9] They

[9]Calendars sometimes do the opposite as well—reminding us of socially irrelevant dates, such as a holiday for another country or a spiritual occasion for another religion.

may be the sign on a door saying when the shop is open, or simply the fact that the shop window is closed up. They may be the clock on the wall, or the national anthem at a sports game (which signifies the beginning, rather than the end, of the game).

New media provide many novel temporal affordances. Most of these come from the fact that social interaction via many media is not necessarily synchronous. The telephone, at least before answering machines, was a resolutely synchronous medium. One would call another person, the phone would ring, and if the other person was available he could pick up the telephone and begin a conversation. Granted, this is not strictly synchronous insofar as there are norms of turn-taking in conversations (Gibson, 2000). However, in media studies it is sufficiently synchronous since the telephone conversation represents a specific event that is bounded in time with very little lag between utterances. By contrast, an email 'conversation' is not bounded in time. Rather, it could take place over many days, and each conversation—considered a "thread" in email parlance—can be interspersed with other conversations. Thus, email is considered "asynchronous". This does not mean that one can spend an infinitely long time between utterances, but rather that an email conversation is spread across time; one may reply later today or sometime next week. One consequence of this aspect of email is that one may deliberate on messages, as well as edit them to one's satisfaction.[10]

Likewise, instant messaging has several novel relationships to time, many of which have affordances given to the user. The most novel of these is the 'status' indicator. Each instant message user has a status, such as 'busy', 'available' or 'offline'. I may not telephone someone late at night, for fear of disturbing them. However, if I notice that they are online and their status is 'available' I may strike up a conversation. Thus, the

[10]Unlike Boase (2006), I do not consider 'deliberation' as an affordance of email. Deliberation is not a perceptual cue, but rather a consequence of email's affordances. I perceive the asynchronicity of email. That is, I know that a message will not be sent until I complete the 'send action' (which is usually a button or specific set of keys), and I can therefore act in such a way to make use of this affordance.

status indicator affords individuals a window into "public time" and "private time" that circumvents the larger social norms of daytime as public and nighttime as private (Zerubavel, 1979). Moreover, for individuals who have friends in different time zones (as is the case with many respondents in our sample), one's public time may be another's private time. Consequently, markers of access may be much clearer than markers of shared time. To note, it is worth emphasizing "may be clearer", as these markers are often used in deceptive or inconsistent ways (Quan-Hasse and Collins, 2008; Baron, 2008) whereby some individuals will leave their client on or simply not attend to a conversation despite a status that suggests the user is "available". Instant messenger programs also tend towards synchronicity. That is, individuals assume they will begin conversations, which are events bounded in time. It does not always work this way, as some individuals may take a long time to respond, or simply ignore the conversation. Also, individuals can and do have multiple conversations going at the same time (which is known to produce a new form of faux pas, when people type in one conversation what they mean to say in the other conversation (Baron, 2008). So to be cute, instant messaging may thus be considered "synchron-ish" rather than synchronous.

2.5.4 Spatial social affordances

Spatial affordances are probably the most well hashed out form of affordances in ecological psychology. A spatial affordance, in general, refers to the properties of an object that indicate a specific relationship between an object's shape and its function. However, spatial *social* affordances refer to properties of space or distance that permit or inhibit social interaction. Spatial affordances in this sense refer both to place and distance.

The spatial affordances of places denote the sorts of interactions that will normally ensue in a given setting. For example, McDonald's is notorious for designing restau-

rants that discourage people from staying for long periods of time. Jacobs (1961) noted how the design of streets can encourage neighbourliness through one-way streets, slow driving and sidewalks closer to front porches than roads.

Technology also has certain spatial affordances. Most specifically, some technologies are mobile. This means that the individual is not fixed to a specific location to use the technology. Instead they are tethered—for example, all mobile devices are tethered to a charger or outlet that recharges the gadget between uses. Devices for mobile connectivity are tethered to 'signal', such as Wi-Fi or 3G (forms of wireless Internet) or cell phone towers (which provide voice reception). Compared to being fixed, tethered devices open up a great deal of freedom within these (often very liberal) boundaries.

However, even stationary technologies exhibit certain social spatial affordances. As Kennedy points out in "Connected Lives: The Project" (2006), and elaborates in other work with Wellman (Kennedy, 2007; Kennedy and Wellman, 2007), where individuals place a computer in the home implies certain forms of usage, and certain relationships to social accessibility. In "Working home", she quotes participant #442 at length (from the same study used herein, see Chapter 4 for study details):

> It's funny, we talked about putting a computer up there [upstairs], but I don't want the computer out of my sight yet. My husband would like it out of here, just because he aesthetically doesn't like it here. But I told him I don't want it out of our sight. I want it where, when the kids are on it, *someone's aware of them being on it*, and we can be in tune with it...It's like, if you want to use the computer, you use the computer here, because we're always either in the kitchen or the family room. That's kind of where we live in the house, so it's a great way to monitor the use (2007, 272, italics added).

Affordances also work in concert to facilitate novel behaviours. For example, Ling notes an interesting emerging cultural phenomenon with cellphones he terms "the

softening of time" (2004). This refers to the fact that a cell phone user can call *en route* to let the waiting party know he is going to be a little late or a little early. This demonstrates how one affordance, mobility, coupled with another, synchronous conversations, can lead to a new cultural form whereby people meet at fuzzy coordinates rather than a fixed place and time.

These four kinds of social affordances are evident in all social activity. That is, all social activity has a relationship to space and time. All social activity contains information and all social activity has a relational context, be it a specific role or personal history. Social activity via media have these affordances just as social activity in specific in-person behaviour settings. By elucidating the specific affordances of a particular interaction context, be it an email conversation or a party, one can come to understand how individuals maintain their connections with others by leveraging specific affordances in specific ways.

2.6 From space-time to social access

The main reason for going through this elaborate (but hopefully not byzantine) description of four classes of affordances is to develop a language for placing mediated interaction on par with in person interaction. This is not because mediated interaction is "as good" as in person interaction, or as useful, but because mediated interaction is now a part of everyday life, civic engagement and social cohesion. It is both a means to an end (of facilitating in person interaction) and an end in itself. This becomes relevant when I examine social relationships in light of new media technology.

Most social thinkers have sought to stabilize social organization by discussing it in terms of space and time. Consider Zerubavel's thoughts on temporality:

> Since any particular event can take place only at one point in time, temporality is a dimension of the world that definitely allows us to make sharp

> and clear-cut distinctions with a minimum of ambiguity. The principle of *temporal segregation* is, therefore, among the fundamentals of social life (1982, 103).

Yet, the temporal segregation of events is no longer a fundamental of social life. Temporal segregation will always be present in some measure, insofar as people can only be in one place at one time. But individuals are nonetheless able to extend themselves through time and space via media. As a contrast, consider a short story by mobile phone scholar Richard Ling, as he tries to grapple with this new reality:

> One morning at about 8:30, I was bidding farewell to some guests who had spent the night at our home in Oslo. At this point, a plumber, with whom we had an appointment, appeared around the corner of the house...The plumber, who I had not met before, continued his phone conversation, checked the address against that which was written on his order, and walked past the departing guests and up the two steps to our porch. Without breaking stride, he walked past me and into the house, giving me a minimal nod. He stopped in the vestibule and took off his shoes...all the while, he continued his phone conversation. After a few closing comments, I turned and retreated into the kitchen, where I was received by the plumber, who by this time had completed his telephone conversation (Ling, 2008, 1)

What this short story illustrates is that researchers are grappling with new media, not as mere novelties or annoyances, but as tools that cut into our stable notions of social organization. By carrying on a mobile phone conversation while doing a job (something many passengers in taxis have now experienced), individuals are indeed able to participate in two events at once. What was before a series of structural constraints has shifted instead to normative or cultural constraints. It is now considered crass, rather than impossible, to send mail while at dinner, or talk on the phone while at the theater.

In the absence of the affordances of new media, individuals are likely to think of structure as a series of constraints. People are constrained by how much income they have, by who their friends are (or not), and what they can accomplish at any given event. Yet, these constraints are never total. By calling these structures "structural constraints", it implies that structure circumscribes the individual. Yet, I suggest that it is more useful to consider structure as a series of regulated channels of access. This is not merely a more optimistic look at structure (access versus constraint), but a more humanistic one. It focuses the lens of inquiry onto the channels that are activated rather than focusing on the possible boundaries that constrain. For example, by sending mail to sjobs@apple.com, I can indeed send mail directly to the CEO of Apple computers. Yet this channel is highly regulated by Steve Jobs' personal assistants. The assistant's job is to screen the email for Mr. Jobs. Because I am very unlikely to receive a response (or a polite one), I do not have social access and I am constrained. Yet, when I email an old friend who I have not seen in years because we live in different cities, I am activating an accessible channel. Does this mean I am unconstrained? Less constrained? We can talk about how much access more easily than how much constraint. Moreover, differential access is much more salient to the actor than structural constraints. Actors do not maintain ties with each other by demarcating the mutual constraints around both individuals, but by negotiating the terms of access. For example, consider the norms of dating. One does not tell the partner what they cannot do (in most cases), but carefully open up as to what they can do. Individuals can give signals of media accessibility by handing out their telephone number, by prefacing it with "I'm usually at work during the day", by giving an alternate telephone number or providing an email address. They give signals of physical accessibility by flirting or getting physically closer. It is only when a date goes awry do individuals clearly demarcate constraints (such as an unwillingness to get particularly intimate, i.e., "no means no"). For the most part they regulate access.

If structure is primarily a series of regulated channels of access, then agency (read: networking) is the process of establishing, maintaining, and regulating these channels.

2.7 Extending the web of group affiliations

Many of the thoughts herein were presaged by Simmel's essay "The Web of Group Affiliations". Therein, Simmel charts the shift in modern society from groups based on propinquity to groups based on mutual interest. Propinquity, muses Simmel, is a sensible way of perceiving group structure in small relatively homogeneous towns. However, as individuals move to larger urban centres where there is a great deal of choice in their associations, then associations shift from being about a single identity radiating outward from a stable core towards many partially overlapping groups, each defined by common interests and goals.

> In general, this type of development tends to enlarge the sphere of freedom; not because the affiliation with and the dependence on groups has been abandoned, but because it has become a matter of choice with whom one affiliates and upon whom one is dependent (Simmel, 1922, 130).

Simmel ascribes this shift towards a more partial and networked form of social engagement on the differentiation of society and population density. Writing at the turn of the 20th century, it is understandable that media were not included in these factors. But it does remind us that shifts in networking are not solely about the technology used, but the technology coupled with a specific environment that permits freedom of networking with specific alters.

2.8 What are the logics of access-based networking?

Before moving into the specific logics of access-based networking it is useful to first spell out what accessibility means. Unfortunately, most work in this area has taken social accessibility as an obvious concept—to be socially accessible means to be available (Zerubavel, 1979; West, 2000; Quan-Hasse and Collins, 2008). The problem with such an implied definition is that it is easy to bend it towards any research question. So I offer a more rigid definition, or at least a lengthier one.

Social accessibility refers to an individual's capacity to learn of or react towards the social activities of other individuals in such a way that it preserves or strengthens the pre-existing relationship or is considered non-disruptive. This definition covers a number of points in the hopes of avoiding potential conceptual pitfalls:

1. This makes social accessibility a *relational* concept (Emirbayer, 1997). It is an attribute of a relation between individuals, rather than the attribute of a single individual. Much like how an address defines both an addressee and an addresser, social accessibility defines the state of being accessible as well as the means by which people are addressed. I am not simply accessible, I am accessible to someone.
2. It emphasizes a normative account of access. This is the distinction between being *objectively accessible* and *socially accessible*. For example, I can show up at my friend's door at the middle of the night, wake him up and ask to chat with him. However, there are only few conditions under which this will preserve or strengthen the relationship. In most cases, it would be considered rude or irritating. By contrast, if I see that the same person out on their front porch, or to use a more technological example, if their instant messenger account is on and says "I'm available", then I can certainly access him.
3. It includes passive contact/awareness. By referring to "learn of" as well as "re-

act to", I am considering the idea that accessibility is not merely about direct person-to-person communication. I may learn of my sister's new job through my mother. I may learn of my neighbour's injury by seeing him walk into his house with crutches. To assume that people are accessible simply by whether or not they answer the telephone (or be "reached" generally), one will miss the totality of the relationship as embedded within larger network structures.[11]

4. To consider social accessibility as a non-disruptive force is to again highlight the distinction between objectively accessible and normatively accessible. Indeed, by knowing someone's home address this will increase their accessibility. Yet, if they live on another continent, then visiting them will be a significant challenge. It is possible, certainly, but it would be very disruptive to one's everyday life.

With this definition in hand, it is possible to finally make a link between affordances and networking in everyday life. Affordances are the perceptual cues for action. Social accessibility is the capacity to learn about and react to others within a normative or relationship-specific framework. *Different affordances give individuals different ways to learn about and react to others. Thus, different affordances alter how accessible someone is, or can be.* To use an example, consider the social accessibility of a friend of mine currently working in Japan. For convenience, we will refer to him as "Jeff". Imagine that I need to find out how to cite Jeff's latest paper, it is nearly 10pm and I am working on a deadline.

Objectively, I can fly to Japan and chat with him. Normatively, this would involve significant planning, time, investment, and hence, disruption. However, by simply turning on my instant messenger account, I can perceive whether or not Jeff is available and then chat via webcam (and save the plane fare). If he is not available at the

[11] I believe that Quan-Hasse and Collins (2008) miss this last point in their otherwise excellent account of social accessibility and IM. For example, they consider status messages as means of gatekeeping, but they are also a form of social contact in themselves. To be accessible does not only mean one will respond to IM, but that people will learn about each other from these status updates.

moment, he may be accessible through other means. I know my friend uses email regularly, so I can send him an email asking when he is available for a chat. Thus, email becomes a perceptual cue for him. If I carbon copy this email to a mutual friend, Jeff may also perceive that I wanted this conversation to be between the three of us (perhaps the mutual friend also wants to learn how to cite the paper). However, there is no obvious affordance for illustrating the time difference. I do not know when Jeff wakes up or goes to bed. Given that there is a difference of eleven hours between clock time in Japan and clock time in Toronto this can be a serious scheduling concern. However, if Jeff emails me and says he is available at 10pm, this specific information can compensate for a lack of a generic perceptual cue.

Now imagine that my friend does not live in Japan, but ten minutes walk from my office. But also imagine it is thirty years ago, so neither of us have cell phones or the Internet. It is getting close to 10pm and I still want to chat. It is a work matter, and probably a trivial one, but I am pushing a deadline and would like to have this citation on hand. As such, he would probably forgive a telephone call. However, I am reluctant to call him as I might wake him (or his new baby) up. By walking to his house I am inconvenienced, but I could then tell if he is up by whether or not the lights are on.[12] However, if I know a mutual friend who is also at the office near 10pm, I could ask her either if she knows Jeff's whereabouts, or at least if it is okay to call him at this hour. Finally, if I know that Jeff routinely goes for a drink with his buddies on Wednesday nights at the neighbourhood bar, I could also try there.

The example from thirty years ago highlights many of the conventional assumptions about social accessibility from Zerubavel's work on public and private time (1982). Namely, that accessibility is tied to time, that there is public and private time

[12] As an aside, Marshall McLuhan noted in *Understanding Media* (1963) that if one could understand the lightbulb as a medium, one could understand the rest of the media in his book. Similarly, if one an understand the social affordance of the lightbulb (as it is presented here), then I suspect one can understand the rest of the examples of affordances as perceptual cues for action.

and that there are public and private spaces. It highlights how in a world of imperfect information individuals rely on existing social norms to navigate social accessibility in light of these broad norms (like public and private). By contrast, the example from today highlights how time and space become mere parameters for social affordances. It is not important that I know when my friend wakes up or even where he is. What is important is that I can perceive his accessibility, or he can perceive my need. Over the past few decades, media have been encoding ever more sophisticated perceptual cues into their systems to help facilitate increasing accessibility. This has led to concepts such as "always on" accessibility (Baron, 2008), the softening of time (Ling, 2004), and email overflow (Hogan and Fisher, 2006).

But as I suggested in the introduction, having new affordances for social interaction does not necessarily lead to anarchic life or social fragmentation. However, it certainly can lead to novel forms of networking as well as increased complexity in how individuals manage these novel forms. One thing that technology represents among others is increased capability for abstraction in everyday affairs. Many affordances are a result of this abstraction, such as a shift from sending a letter to sending data that represents a letter. The following work demonstrates this abstraction in everyday life. It demonstrates how individuals are shifting from a focus on "being at the right place at the right time" to "accessing the right people in the right way"—a shift found in the earlier notions of networking from the introduction of this chapter. Networking in everyday life is now about access rather than context. Perhaps it always was, but the superimposition of new technologies into everyday communication has given this claim newfound clarity.

The theoretical framework above leads to numerous possible research questions about the relationship between social affordances, social accessibility and social networks. Given all the potential affordances of new media, how are these affordances realized in everyday life? Are there global logics that permeate all forms of network-

ing? Are there specific bundles of features that work well in combination? Do certain features work best with specific kinds of people, or specific kinds of relationships? Since affordances are perceptual, are certain kinds of people most likely to notice these affordances and take advantage of them? And most broadly, how does the wholesale introduction of new media affect our notions of shared places and spaces? This last question leads this work into the well worn territory of modernity theorists who perennially seek a shift from pre-modern notions to modern or postmodern. Whether one considers Simmelian groups (Simmel, 1922), gesellschaft to gemeinschaft (Tönnies and Harris, 2001), mechanical to organic solidarity (Durkheim, 1933), networked individualism (Wellman, 2002), Bell's post-industrialism (Bell, 1973), or Castell's network society (Castells, 2000), certain technology-oriented themes persist. These social theorists walk a thin line between deterministic structural forces 'causing' social transformations in work or social life, and the careful but accidental march of history. Each one includes a nod to how technology in some form or another (be it the automobile, automation, computers, technologies of warfare, etc...) is coupled with broad social changes. Granted, this is a far less ambitious task than many of the theories just mentioned. Here I am merely looking at how a social affordances model of social accessibility (as manifested through the use of multiple media) is associated with one's social network. This, of course, is only one small part of how technology is unfolding around us and influencing everyday life.

The following chapter spells out some of the research questions that emerge from this framework, and how they can be answered using empirical data.

Chapter 3

A theory and agenda for networking

3.1 Introduction

THIS short chapter briefly introduces the research questions that will be addressed throughout this dissertation. As mentioned in the introduction, this thesis takes a single question (How can we characterize the strategies of multiple media use so that it makes obvious (1) how individuals think about their network, and (2) how they act on that network?) and approaches it from three levels of analysis. The first level is that of the individual, the second is the full personal network (i.e. both the alters known by an individual and the ties between these alters), and the third is the relationships with specific network members. At all three levels I focus on how media use can lead to differences in social accessibility through the use of different affordances. However, beyond that, each level has its own specific demands, and thus, its own distinct questions and corresponding analytical techniques. After addressing each question in turn, I conclude by harmonizing the findings and concepts into a social affordances model of social accessibility, and discuss how this model can simultaneously facilitate greater networking opportunities as well as burden individuals with more complex options.

3.2 The individual level: Demonstrating and explaining individual styles of media use

As a first step in a theory of networking, I start with the premise that individuals have relatively stable strategies for networking. These strategies may vary from person to person, but for each individual the strategies are both rhythmic and habitual. These strategies represent a "networking repertoire". There are numerous precedents for this assertion. They include the work of Swidler (1986), who offers a cultural toolbox model, Burt (1992) who refers to a model of networking as information brokering, Spencer and Pahl (2006), who articulate a series of friendship repertoires and Wellman (2001b), who suggests a broad social shift from door-to-door to place-to-place and finally person-to-person networking.

The suggestioin that networking is a stable repertoire can be contrasted with a socially determined view that networking is merely an adaptation to social conditions. Granted, this is probably true to a point. However, for the most part what stands out is how individuals themselves harmonize their social structural conditions with their networking repertoire, rather than have their repertoire determined by it.

Research question 1: How can we characterize strategies for maintaining contact with others? Based on the theoretical framework espoused in Chapter 2, I can suggest that strategies for action refer in large measure to habits. In this case, "frequency of activity" is a reasonable if not ideal measure of how rare or habitual an activity is. If one does something daily, it is clearly a part of a routine and habit, while the same can be said, to a lesser extent, for weekly activities. Thus, I can use frequency of activity as a way of clustering the sample into different activity profiles. Given only a small number of variables it is possible to come up with many combinations of activities such that no two people have exactly the same strategy. However, it is also possible to look beyond minute differences towards overall similarities. Using

cluster analysis, I discover these similarities. I first show why a particular clustering solution is considered optimal and then what this cluster can tell us about differences in networking. In terms of affordances, one can say that certain affordances work well together. For example, planning by email to meet at a specific location works well, but since many people do not have mobile email, this media may be well supplemented by cell phone contact.

Maintaining contact is not entirely mediated, of course. As such, I examine both profiles of media and profiles of social activities. The specific activities as well as the specific media are discussed in Chapter 5.

Research question 2: To what extent can social locations account for variations in networking? As mentioned above, it is only an assumption that repertoires are a personal preference rather than socially determined. I try to give weight to this claim by showing the relationship between a series of selected social location variables that can plausibly inform or shape how people network. For example, it is plausible that couples would network differently than single people, or that recent immigrants might network differently than Canadian-born (or longtime residents).

In the language of the theory chapter, these social contexts provide external conditions that may lead to affordances for organizing social relationships in particular ways. For example, being a parent is an objective external condition. This leads to certain perceivable affordances—it may routinize one's perception of time, make individuals sensitive to where their house is (near a park, has a backyard, etc...), or make individuals sensitive to specific form of homophily, such as emphasizing friendships with other parents or renewing social bonds with other caregiving family members. To the extent that child rearing is well-defined and salient external condition it leads to networking in different ways (or rather nudge individuals towards a sort of style that accentuates their specific needs). The same can be said for many other external conditions such as one's level of wealth, whether or not they are coupled, employed,

etc...

Research Question 3: While people may have social activity styles and media use styles, do these complement each other or work independently? Media are not mere dumb conduits for our will to connect with others. They facilitate socializing by affording specific relationships to social structure. Email affords a particular relationship to time and mobile phones afford a particular relationship to space. And even if these technologies only offer partial coverage of our network, using the two together might offer greater access to more network members. Thus if one has a style that weighs heavily on these media, they are not merely "technology aficionados", they are afforded a different perspective on how and when to contact others. This opens up different opportunities for interaction, or allows individuals greater choice in selecting the sorts of interactions they can successfully put in place. A relationship between social activities and media use styles definitely reinforces a social affordances theory of networking. Such a relationship suggests individuals successfully employ media as a means to interfacing with a particular kind of social structure, not because they like the media, but because they like the results. These results are then fed back into the decision loop of how individuals decide what media to use and when.

This research question draws on pre-existing concepts from environmental sociology and studies of everyday life. For example, Howard contends that individuals employ media in such a way that it "fits" in with existing activities and demands. It may modify them over time, but it will not be used if it does not fit. In a more classical sociological sense, Michelson has introduced the idea of congruence. For example, individuals with children wish to move into the suburbs because it coheres with their notion of how to raise a child (i.e., they need a backyard to play in). He also mentions that individuals do not randomly assign themselves to particular areas of the city or into houses versus apartments, but look for a place with a specific notion of how they will use that place to fit into their everyday lives. Media similarly should present such

congruence, or fit. But how?

3.3 The network level: Exceptions to general strategies based on variations in how people conceive of networks

Individuals are rarely offered limitless opportunities to network with whoever they want and whenever they want. Rather, individuals maintain a relatively specific set of alters. Many of these individuals can be elicited through personal network capture techniques such as the name generator. Moreover, in addition to knowing the number of alters in the network and proportion of alters who are one type rather than another, one can consider the structure of the network itself. How individuals network may depend strongly on both the kinds of people in the network, but also how these people relate to each other *in the eyes of the respondent*. Chapter 6 examines this structuring of ties to illustrate how different social roles work either as bridges or bonders within the personal network and whether variations in the composition of the network are associated with variations in the ways in which individuals network with each other.

Research Question 4: What roles most evidently show a group-like structure across networks? Group-like structures in the network are relevant in several ways. First, they indicate cognitive categories as much as actual social structures. That is, people may consider certain alters as belonging to a group whether or not these individuals actually possess this objective structure (Freeman, Freeman, and Michaelson, 1989; Freeman, 1992). Second, participants could indicate groups as a part of the socila network collection method. the process used to collect the social networks from participants included the ability for participants to signal groups, yet most network measures, including those used herein, merely distill these groups into a complete set

of edges and work with the edges. By giving this matter scrutiny, I can talk about later models with greater confidence. Third, Wellman's persuasive theory of networked individualism frequently refers to a shift from groups to networks in social life. I use this theory in several areas of this work, and so it is relevant to understand who these groups are.

Research Question 5: How does the variation in contact with network members relate to structure? Taken solely as structures of relationships, social networks are clearly ordered, and roles help to define this order. By positing networked individualism as a theory of network composition, we can classify some roles as being more networked individualistic by virtue of their linking patterns (e.g., spanning the network rather than linking inwards towards homophilous roles). However, this is merely a secondary task (here, at least) to an appreciation of the networks as points of access for media use.

One premise of the theory of networked individualism is that networked individuals will make use of new media technology to facilitate more person-to-person interaction and less place-to-place interaction. Hence, media use will not superimpose itself cleanly over groups, but rather cut across specific boundaries, as individuals fine-tune their networking patterns with others (Kim, Kim, Park, and Rice, 2007; Wellman and Frank, 2001). This theory works well within an analysis of the social accessibility with alters. Namely, it suggests that access (both one's ability to access alters and one's actual behaviour) has changed as a result of the introduction of new media—or more precisely, that new media affordances facilitate new ways of interacting with alters *enabling* new patterns that are person/dyad specific rather than globally applied (Wellman et al., 2003).

In Chapter 6 I explore the variations in overall contact with the network (i.e. how frequently do individuals contact *anyone*). I investigate the extent to which these variations in contact are associated with variations in network structures. According to

networked individualism, there will not merely be person-to-person networking and specific networked individualistic structures, but the two should be associated with each other.

3.4 The alter level: Who gets access and why?

Regardless of the relationship between overall network structure and the variations in networking with others, there are still reasons why one might vary contact with specific alters. Saying this another way, Chapter 6 examines variability of media use with one's network in general. Chapter 7 examines variation in the number of media used with specific network members controlling for network structure.

A prevailing hypothesis about this process is Haythornthwaite and Wellman's theory of media multiplexity (1998). This hypothesis suggests that the more strongly tied ego is to alter, the more media ego will use with alter. However, the overall theoretical arc of this dissertation is that networking is about accessibility rather than tie strength. Strong ties are usually accessible to some extent, but do people use more media with strong ties regardless of their social accessibility, or do people use more media with accessible alters regardless of closeness[1]. Recall that accessibility was defined in Chapter 2 as an individual's capacity to learn of or react towards the social activities of other individuals in such a way that it preserves or strengthens the pre-existing relationship or is considered non-disruptive. Using this definition, alters that are more spatially proximate are more socially accessible, as it involves less of a disruption to access them. Also, alters that are structurally embedded (Moody and White, 2003; Wellman, Carrington, and Hall, 1988), or share many mutual relationships with ego are more accessible.

[1]While it seems like a rather large assumption, I use tie strength and interpersonal closeness interchangably. This is a common convention the literature, following Granovetter (1973) and Marsden & Campbell (1984).

3.5 Presenting a coherent framework

How can these disparate questions from different levels of analysis be unified? In the conclusion I offer a story of multiple media use in everyday life that seeks to do just that. After having examined variations at these levels, I conclude that many differences in networking can be understood primarily as either individual attributes or propensities or matters of the specific relationship between ego and alter. However, because of these two phenomena, networking can be an increasingly differentiated affair. The norms for networking that are associated with small bounded communities are being replaced by person-specific gatekeeping practices (i.e. differences in social accessibility). Ultimately, the use of additional media may enable access to more alters or more diverse alters, but it also complicates the process of networking in general. Thus I conclude by addressing the conundrum: How is it that the use of multiple media simultaneously makes it easier to access individuals and yet more difficult to network in general?

Chapter 4

Research methods and measures

4.1 Introduction

THE data for this analysis comes from the Connected Lives Project, a study of communication and media use in East York, Ontario, Canada. This chapter will present an overview of the research site as well as the specific methods used for capturing data. This includes a report on the composition of the data and its representativeness, an overview of the multiple instruments used to assess network size and structure as well as the instruments used to assess media use.

4.2 The research site

East York is a 22.26 km^2 area of Toronto just north east of the downtown core. Up until 1998, East York was a semi-autonomous borough of Toronto. In that year, the borough was dissolved as a separate governing area. Nevertheless, East York still maintains some semblance of a separate identity, with summer festivals, custom street signs, its own newspaper (The East York-Riverdale Mirror) and several community centres.

East York was selected for the research site by principal investigator Barry Wellman. Wellman had previously studied East York on two occasions. Initially, he was a

co-investigator of a research team studying interpersonal relations, mental health and social support in 1969. This study was followed up ten years later with Wellman's second, longitudinal study of social networks and community. Both studies were considered particularly fecund, having spawned numerous papers including one each in the *American Journal of Sociology* (Wellman, 1979; Wellman and Wortley, 1990). In the original study design, Wellman suggests that East York was particularly appropriate for an analysis of community given its relative ethnic and cultural homogeneity. He was especially interested in the idea that a person's set of intimate ties was only partially tethered to the neighbourhood, and actually extended out through the city and the world. Whereas the examination of a cosmopolitan and transient area might bias these results, he believed that the ethnic and cultural homogeneity of East York would be a more persuasive setting. The results of this analysis did indeed show that one's personal ties were far flung and disparate (Mok, Wellman, and Carrasco, 2008).

As a consequence of Canada's immigration policy as well as geographically concentrated chain migration, the cultural make-up of East York has changed dramatically in the last 30 years. That said, this situation is far from anomalous. Rather, it is very representative of the changing ethnic landscape of Canada's urban centres (Statistics Canada, 2003). As of 2001, over 40 percent of Toronto's population were foreign born. While the changing cultural composition of East York is not directly addressed in this dissertation, it does help to colour and interpret the networking styles of the participants. Twenty-four percent of the survey and 17 percent of the interview are immigrants who have been in Canada less than ten years. As will be discussed in the results chapters, these individuals are especially prone to using ICTs such as webcams and online chat rooms as a means for keeping contact with their non-local ties. This result has been reinforced by recent analysis of this data by Mok et al. (2008).

4.3 The survey implementation process

The initial survey design called for a self-administered survey. The resulting document was a 32-page questionnaire. The questions were developed by the Connected Lives research team, a collection of 8 graduate students under the direction of Barry Wellman.[1] The design and layout of the survey was done by myself using InDesign CS, an industry standard typesetting program. The survey is included here in Appendix A.

The sampling frame for the drop-off and pick-up process was a list of 1000 names and corresponding addresses stratified by FSA (Forward Sorting Area, i.e., the first three letters of the postal address). Each name was sent an introductory letter letting them know that someone would be by with a survey in the forthcoming weeks. A team of about 20 undergraduate and graduate students performed the pick-up and drop-off process. The survey delivery process began in August of 2004 and continued until January of 2005. The status of each drop-off was recorded using an online database designed by myself and Michelle Levesque, an undergraduate computer science student. If a survey was not completed in two weeks, we mailed a reminder to the participants. After four weeks we mailed a second copy of the questionnaire to the respondents along with a self-addressed stamped envelope. After three unsuccessful attempts, the survey was abandoned. Upon completion of the survey respondents were given a 5 dollar coupon booklet for Tim Horton's (a popular Canadian coffee chain) as a thank you gift.

The survey delivery process resulted in 350 completed and returned questionnaires. As only 621 of the 1000 names were valid, this results in a response rate of 56 percent. The remaining 379 names were removed due to a number of factors such

[1]The author would like to acknowledge this team of graduate students (in alphabetical order): Kristen Berg, Jeff Boase, Juan-Antonio Carrasco, Rochelle Côté, Jennifer Kayahara, Tracy Kennedy and Inna Romanovska. Additional members and acknowledgements can be found in Wellman et al. (2006).

as lack of language skills, frailty, death or having moved.

4.4 The interview implementation process

Understanding the limitations of survey data, we designed a follow-up interview on the topics included in the Connected Lives survey. The interviews were designed by the same team of graduate students under Barry Wellman. Like the survey, this interview covered media use, social engagement, social support and household relations. It also included a novel network analysis tool which we could not include in the survey due to its complexity. This instrument is discussed in Section 4.7.5.

The sampling frame for the interviews was taken from the completed surveys. Every completed survey included a contract which was a single sheet kept separate from the survey booklets. In addition to reviewing the usual norms of survey delivery (such as confidentiality, and how we would use the data), it also gave the respondents a place to indicate whether we could contact them for a follow-up interview. We gave them three options: yes, no, and maybe. We contacted everyone who answered yes or maybe. This was 170 of the 350 respondents. We contacted these 170 individuals, offering 20 dollars for a two hour interview.

Between January and April of 2005, 87 interviews were completed. Eighty-six of these are valid interviews for the analysis network herein, and one is excluded because no network analysis was performed (due to the respondent's frail condition during the interview). Despite the fact that the interviews only represent 25 percent of the total sample, the resulting set of respondents is still reasonably representative of East York.

4.5 Representativity and basic demographics

This section will compare some demographics from the 2001 Canadian census and the survey and interview samples. It will be shown that both the survey and the interview are marginally biased on several characteristics, but overall show a reasonable level of comparability with the target population. This means that it will be difficult to assert point estimates about the population with absolute precision. However, given that this sample still represents a large, mainly representative swath of East York's population, I should still be able to make reasonable claims about the correlations between specific variables without fear that the results are spurious due to sample bias.

Data from the 2001 Census was provided through Statistics Canada's online community profiles.[2] These data along with the corresponding percentages from the Connected Lives survey and interview are summarized in Tables 4.1, 4.2 and, 4.3. The first table reviews personal characteristics (age, gender, and nationality). The second table reviews household characteristics (marital status, and family composition). The third table reviews socioeconomic indicators (employment status, income, and education). In each case, the data from the survey and interview were filtered to match the Census data. For example, the Canadian census community profile only publicly reports on the education levels of those 20-64. This is why the N for the survey and interview sample is significantly lower than the expected number of cases (350 and 86, respectively). The only case where data were substantially underreported was income.

4.5.1 Personal characteristics

The survey sample is somewhat biased in terms of age, gender, and nationality. These biases were in the expected direction for a self-administered questionnaire. Such sur-

[2] See http://www12.statcan.ca/english/Profil01/CP01/Index.cfm?Lang=E

veys are more likely to be done by older individuals, as well as females. Immigrants are underrepresented as several of them found the survey (written only in English) too difficult to complete. Nevertheless, none of the biases are greater than 4 percent. Age shows a substantial regression towards middle age. The median age of the sample is not far off of the median age of the population, however, there are fewer elderly individuals in the sample as well as fewer younger individuals. This is the result of two forces. Biasing the sample against elderly individuals is the fact that this survey was framed in terms of technology use. As such, a number of older individuals felt it was not relevant. Other older individuals were in care, others still had died. This last point is because the sampling frame was approximately a year old by the time we deployed the surveys. This also helps to explain the relative lack of younger individuals. Younger people are more likely to be transient, to rent, to share a place with other young people, and to not have a landline telephone. Thus, a landline telephone number-based sampling frame will underrepresent these individuals. (Wellman et al., 1996)

The consequences of this data is that a number of networking styles (discussed in Chapter 5, will be underrepresented. In that chapter I partition the sample into discrete categories based on a 'style' of media use and social activity. It is highly probable that the clustering algorithm would pick up on the same styles if this analysis was more representative. The difference being that the relative *proportion* of styles shown in the population probably varies from a true population estimate.

The interview sample shows the same sorts of biases, although these biases are even stronger. Whereas 53 percent of the population is female, 59 percent of the interview sample is female. The interview sample also shows a positive skew on age, as well as a regression towards middle age. This is due primarily to access. Older individuals, particularly middle aged and those who are retired were more willing to spend a few hours for the interview than younger individuals. Nevertheless, the

	East York	*Sample*		*Interview*	
	Percent	Percent	Diff.	Percent	Diff.
Percent female (15 and older)	53.2	57.6	4.36	59.3	6.06
N (15 and older)	93,960	349	—	86	—
Foreign-born population	44.8	47.2	2.41	44.2	-0.59
Immigrated in last 10 years	21.9	23.5	1.58	17.4	-4.48
N	114,240	336	—	86	—
Age					
15-19	6.1	2.0	-4.10	0.0	-6.14
20-24	6.6	4.7	-1.94	2.4	-4.24
25-44	43.4	47.1	3.66	36.5	-6.96
45-54	17.1	20.9	3.85	23.5	6.45
55-64	10.1	14.2	4.12	22.4	12.23
65-74	8.3	6.1	-2.16	10.6	2.32
75-84	6.1	4.1	-2.06	3.5	-2.60
85 and over	2.2	0.9	-1.37	1.2	-1.07
N	93960	344	—	86	—
Total	115,185	350		86	

Table 4.1: Personal characteristics of East York, the survey sample, and the interview sample

	East York	*Sample*		*Interview*	
	Percent	Percent	Diff.	Percent	Diff.
Household Characteristics					
Single	34.1	32.7	-1.39	32.6	-1.58
Married	48.3	54.4	6.07	51.2	2.85
Separated	3.3	2.9	-0.42	4.7	1.30
Divorced	7.4	5.6	-1.80	7.0	-0.38
Widowed	6.8	4.4	-2.46	4.7	-2.19
N	93,960	342	—	86	—
Household type					
Couple with children	26.9	38.8	11.93	36.0	9.15
Couple without children	23.8	23.8	0.01	27.9	4.09
One-person households	30.8	22.9	-7.82	19.8	-10.99
Other household types	18.5	14.4	-4.10	16.3	-2.24
N (households)	46,585	340	—	86	—
Total	115,185	350		86	

Table 4.2: Household characteristics of East York, the survey sample and the interview sample

interview still covers individuals ranging from early twenties to individuals in their eighties, and the age distribution is still normal.

4.5.2 Household characteristics

A number of household and marital types were sampled with clear precision. Namely, those who are separated, divorced, widowed, and childless couples comprise nearly the same amounts of both the population and the sample. However, the sample does overrepresent married couples, particularly married couples with children. Correspondingly, the sample underrepresents one-person households as well as living arrangements other than a married couple. Similar to the reasons for underrepresenting younger individuals, I believe this is due to these individuals being transient and thus particularly difficult to access through the sampling frame.

Interestingly, the interview sample more accurately represents the marital status

of the population than the survey. However, the interviews were even less likely to capture single-person households. I believe that this is again exacerbated by the transience of these individuals. About 15 people had moved between the survey and the interview and thus could not be contacted. Single people made up the largest share of those who could no longer be contacted.

4.5.3 Socioeconomic characteristics

Both the survey and the interview faithfully represent the labor force participation of the population. Labor force participation is defined as individuals who are working (either part or full time) either for an employer or self-employed as well as individuals who are on paid long term leave. This represents 66 percent of the population, as well as 66.7 percent of the survey sample and 65.1 percent of the interview sample.

The Connected Lives survey follows the standard practice of allowing individuals to select an income range rather than give a specific number. This is why the median income is reported as 50k to 75k, rather than as a specific value. The median income given by statistics Canada for 2001 was 46.5k. Adjusting for four years of inflation, the income of East York should be 50.7k.[3] Therefore I believe that income biases in the East York sample are slight at best and generally due to the underrepresentation of single-person households as well as younger individuals. Also, income has the most missing data of any demographic variable. The missing data are biased toward those of less education. While 15 percent of those with an undergraduate or advanced degree did not report income, 24 percent of those with high school or less did not report income. Thus controlling for other factors, it appears that there are few biases in the survey values of income.

Finally, the survey and interview sample overrepresent those with a university

[3]Income adjustments were made using the consumer price index measure of inflation for July 2001 and July 2005. The values can be obtained from the Bank of Canada, <http://www.bankofcanada.ca/en/cpi.html>.

	East York	*Sample*		*Interview*	
	Percent	Percent	Diff.	Percent	Diff.
Median Income					
All households	46,963	50-75k	—	50-75k	—
One-person households	30,252	30-40k	—	50-75k	—
Two-or-more person households	58,471	50-75k	—	50-75k	—
N (households)	46,585	271	—	71	—
Labor force participation	66.0	66.7	0.70	65.1	-0.90
N	93,960	343	—	86	—
Education (of those aged 20-64)					
Less than a high school graduation certificate	17.4	6.4	-11.06	1.4	-16.02
High school and/or some postsecondary	24.2	27.8	3.52	23.6	-0.63
A certificate or diploma (colleges and trades)	23.1	18.4	-4.72	19.4	-3.67
University certificate, diploma or degree	35.2	47.5	12.29	55.6	20.36
N	72365	299	—	72	—
Total	115,185	350		86	

Table 4.3: Socioeconomic characteristics of East York, the survey sample, and the interview sample

education while underrepresenting those with less education. This is probably a consequence of the survey deployment. Those who have been to university are more sympathetic to a university-run survey than those who have not.

4.6 Interpretations of the biases of the samples

The biases inherent in the Connected Lives survey should not interfere with the conclusions drawn from the analysis. The purpose of the analysis, in general, is to articulate a logic of networking in everyday life. The assertion of the prevalence of specific logics of networking in the population is a secondary concern to merely spelling out these logics in the first place. So, if 21 percent of the sample versus 24 percent of the population are active users of both cell phones and email, then this difference will not interfere substantially with our understanding of *why and how* this group uses cell phones and the Internet.

That being said, a number of the biases, such as age and gender, are also worth considering as explanatory and control variables. Where appropriate these variables will be kept in models.

Finally, on a positive note, while not perfect, this study does do a good job of representing the diversity of demographic indicators in East York. Apart from education and family composition no indicator is more than six percent off of the population value, and most are within three percent or less. The indicators of income and labour force participation were particularly accurate. Also, given the potential language barrier of new immigrants, this sample also clearly does an effective job of capturing the share of new Canadians in East York. As such, it is unlikely that any conclusions from this study will radically depart from those drawn from the population.

4.7 Key concepts and selected instruments

This study was focused on an analysis of media use and social networks, primarily. Both of these domains present specific challenges to the researcher. This section will highlight the specific instruments used and indicate how these instruments were employed to meet these challenges. This section will cover social network instruments first, followed by media use instruments.

4.7.1 Measuring the personal network

A personal network is a set of individuals who share a meaningful relationship with a given person. One of the most challenging parts of operationalizing this definition is deciding how meaningful is meaningful enough, especially given the need to ensure accuracy in self-administered questionnaires and to minimize respondent burden in an interview setting.

A note on wording: Because both the respondent and the respondent's network members can be called individuals, this can lead to confusion about who one is discussing. To get around this potential confusion, personal network scholars use the convention of calling the respondent 'ego' and any member of the respondent's network 'alter'. It is also convention in social network analysis to name the link between any two individuals as an 'edge' if it is undirected and an 'arc' if it is directed. In this study all relationships are considered symmetric and thus I will be primarily referring to edges. Affective symmetry is a significant assumption and one that is made in the interests of simplicity. If we were to interview the alters and get their perspective we would be in a position to understand whether this tie is symmetric and whether the strength is similar. The word 'tie' will also be used frequently. In general, a tie means the same thing as an edge. Yet there are special instances where there is a conceptual distinction. One such case is when considering individuals who have multiple relationships (such as friend, workmate, and neighbour). There is still only one tie be-

tween ego and alter, although the two share a multiplex/multistranded relationship. Also, ties are infrequently used in a metonymic way; that is, the word 'tie' actually refers to an 'alter'. This is typically when alter is modified by an adjective. So ego has an *alter*, but that alter is a *strong tie*, or perhaps a *work tie*.

It is conventional to use socioemotional closeness as a measure for who to include in a personal network. This has been the case since the 1970s, and the first personal network studies. The idea that some people are 'close' to ego while others are merely acquaintances is also easy to explain to respondents and is well understood culturally.

One of the criticisms of using closeness as a yardstick for who to include in the network is that it may ignore people who have an influence over ego even if they are not especially close. There are two prominent cases of this. The first is when alter is in frequent but non-voluntary contact with ego. For example, individuals may not be close to people from work, but yet see them everyday. A boss may have direct influence over ego's social calendar by asking ego to work late, even if ego does not like the boss. This is a valid concern. However, it is seen as a necessary compromise. We could either use closeness as an organizing principle for the network, or frequency of interaction. Given the history of the use of closeness in personal network studies (Wellman, 1979; Fischer, 1982; Marsden and Campbell, 1984; Boase et al., 2006) and the problems inherent in recalling frequency data (Bernard et al., 1979; Freeman et al., 1987), measuring closeness first and then recalling some frequency data later seemed to be an appropriate track.

The second concern is when there is a transitive tie that is relevant for social activity. For example, ego may frequently attend parties with alter. These parties are hosted by alter's friend, and ego is not close to alter's friend. Thus, even though the friend is important in defining the opportunity structure for social engagement, they do not appear in the network. This particular case is simply outside of the scope of what one can expect to ascertain in a general personal network study.

I believe these concerns are study-specific. This is a study about how individuals organize their interaction and communication with others. Those individuals that a person wishes to have voluntary contact with are the most likely individuals to be considered close. Also, any individual who maintains a consistently important role in a person's social life will tend to become a close individual.

4.7.2 Capturing the network

In an interview setting and especially a self-administered questionnaire, it is impossible to expect the respondent to elicit all the individuals to whom they are tied. Past estimates suggest that an individual has anywhere between 250 and 2000 alters depending on the criteria used. The most extensive strategies involve diaries (Boissevain, 1974; Fu, 2007) or specific comparative sampling measures, such as how many people one knows in prison (McCarty et al., 1997; Zheng et al., 2006). As such, the researcher should select a strategy that filters out ephemeral and insignificant ties while highlighting the alters with whom ego shares a relevant tie. For this reason, network researchers commonly refer to the strength of the tie, and seek to capture the strongest relations.

Tie strength was clearly formulated by Granovetter in "The Strength of Weak Ties". Here he suggests that tie strength is a "combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize that tie" (1973, 1361). In the wake of Granovetter's research, scholars have sought to uncover a single parsimonious concept that encapsulates most, if not all of these dimensions of tie strength.

Marsden and Campbell (1984) tested the relevance of three of the above dimensions of tie strength, namely the frequency of interaction, the emotional intensity and the intimacy of the relationship. They contend that the emotional intensity of the relationship most faithfully represents tie strength. Emotional intensity also approximates

the idea of "closeness", and for this reason, the network instruments on the Connected Lives project employ the idea of ties as being either "very close" or "somewhat close".

As can be seen from the survey instruments, the language of "somewhat close" and "very close" ties permeates the network instruments. However, the survey design team also provided an elaboration of closeness that maps closely on to Granovetter's original concept. The survey states:

> Please think about the people in your life who do not live with you. We would like you to consider those who you are VERY close to and those who you are SOMEWHAT close to.
>
> **VERY close:**
>
> •Those that you regularly discuss important matters with,
>
> •Those that you regularly keep in touch with, or
>
> •Those that are there for you when you need help.
>
> **SOMEWHAT close:**
>
> •More than just 'casual acquaintances', but not 'very close'.

This quote is from the survey, although the interview used virtually the same wording. The wording of this question is drawn almost exactly from Boase et al.'s (2006) study of media use and social networks in America. This is not a coincidence as both Boase and Wellman were members of the Connected Lives design team as well as designers of the earlier study.

As can be seen from the wording, one can superficially pass over the details of what 'very close' means and still have a reasonably good sense of what it encapsulates. It is also worth noting that while the survey includes an indicator of the frequency of interaction, it is not a neutral indicator. Rather than considering very close individuals as

those that one frequently contacts, we carefully chose 'regularly keep in touch with'. This latter phrase does not necessarily mean the most contact, but it does imply that ego shares a mutual interest in maintaining contact. It also frames the kind of contact as being oriented towards mutual affection. One 'regularly reports' to their boss, but one 'regularly *keeps in touch*' with alters. This is in keeping with Marsden and Campbell's criticism of contact frequency as a measure of tie strength (1984). They point out that numerous individuals are in frequent contact (such as neighbours or coworkers) because of shared structural location. This is not to say that one should exclude these individuals, but it implies that frequent contact is not a sufficient condition for inclusion in one's personal network.

A socioemotional definition of network membership is especially important for this particular analysis. This work is focused on the styles and strategies employed by ego in everyday life. There are a number of settings where ego's pattern of networking may be especially constrained (Webster, Freeman, and Aufdemberg, 2001). By focusing on the voluntary and emotionally close ties rather than structurally imposed ties (such as one's coworkers) I am able to look at the relationships for whom ego has the most latitude in organizing daily affairs. This should lead to a more appreciable and realistic appraisal of the differences in everyday communication and social engagement.

4.7.3 Survey measures

The survey did not ask individuals to explicitly name all of the very close and somewhat close ties in their network. Such a strategy would likely be abandoned by many as overly tedious and possibly invasive. Instead, we employed a 'summation method'. This method, originally developed by McCarty et al. (McCarty, Killworth, Bernard, Johnsen, and Shelley, 2000), was designed to partition the network into manageable chunks. These chunks are generally related to the role of the alter. The instrument

asks the respondent to give the number of people in each of eight possible roles, for both somewhat close and very close ties. Thus, instead of asking for one or two estimated figures, the respondent can break this onerous task into 16 manageable smaller counts. The eight roles are:

1. Members of your immediate family who do not live with you (such as parents, siblings, children)
2. Other relatives
3. Neighbours
4. People you currently work with, or go to school with
5. People you only know online
6. People from organizations (such as church, sports leagues, business associations)
7. Friends not included above
8. Other people not included above

These roles are similar to the ones used in Boase et al. (2006). However, they only included five roles. Roles five through eight in the Connected Lives survey were all combined in Boase et al.'s study into "Other people who are not co-workers or neighbours, who you are very close to". For this reason and the fact that Boase et al.'s study was a telephone survey rather than a self-administered questionnaire, comparability is possible but limited.

4.7.4 Survey results

Results from the survey show that individuals have a diversity of social network structures. Most individuals include a few family members as well as several friends, but otherwise their networks vary considerably. Figure 4.1 displays the distribution of network sizes from the survey. Both somewhat close and very close network sizes

show significant positive skew. While the mean number of very close alters is 13.4, six individuals have at least 51 alters (outliers). One individual reports having 155 very close alters. I believe that the reliability of the count of network size decreases with the number of alters included. As respondents include more individuals, they tend to 'round up' the numbers. For example, the individual who has 155 very close alters has 50 very close alters online as well as 50 very close alters from organizations and 20 friends. Nevertheless, I believe that the numbers represent relative network sizes faithfully, even if the specific counts are overinflated. I elaborate on this claim below after reviewing the network sizes from the interview.

Apart from a few outliers there are still novel descriptive insights to be gleaned from the composition of the networks. Figure 4.1 shows the share of the individuals in the network by role plotted by network size. Each line represents the percentage of the sample who have a certain number of individuals in their network by role. The line with square marks shows family members. Intuitively, it shows that most individuals at least one family member in their network, but also that it is very uncommon to have many family members (as opposed to a large extended family). This is indicated by the sharp decline between 3 and 5 immediate family members. The networks also show that very few people have individuals known only online. Only ten percent of the networks report knowing anyone online. However, as can be seen by the flat slope, if people are to include alters only known online it is common to know several of them. Another finding can be interpreted from examining all of the lines at the 6-8 member mark. This shows that people have a diversity of different roles in their network. Forty percent have at least eight friends, three neighbours, four co-workers and/or seven family members. Since the slopes for all of the lines descend very close to each other, it seems that no role is particularly prominent in most networks, nor is any role (except those known only online) particularly rare.

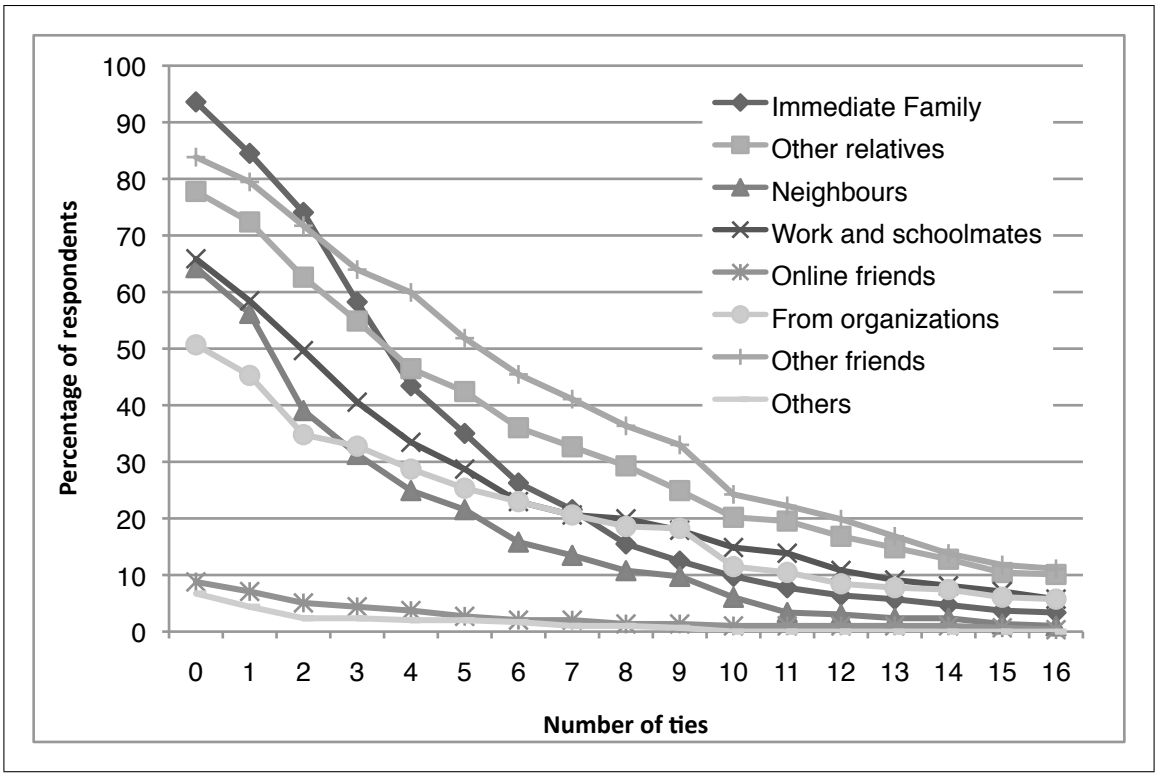

Figure 4.1: Prevalence of network membership by role

4.7.5 Interview measures

The summation method used in the survey is an efficient method for capturing alters. Prior research suggests that in most cases it reasonably approximates the number of network members (McCarty et al., 1997, 2000). Nevertheless, better measures exist although they are more costly and complex to implement. The most common and well-vetted measure for ascertaining network size is a 'name generator' (Burt, 1984). This method, best done in an interview, asks the respondent to elicit the specific names of individuals with whom they have a specific relationship. The Connected Lives study uses a modified name generator based on socioemotional closeness. The initial name generating stage remains the same, but we use a novel technique for capturing the edges between alters as well as capturing additional data about the alters. This novel technique involves producing a real-time visual display of a person's social network. Because of its novelty and relevance to this work, it will be discussed in detail.

Name generators have a long history in social network analysis. The earliest name generators date back to the mid-1960s. Laumann's Detroit Area study is often recognized as the first study to include a name-generator (Laumann, 1973; Marin and Hampton, 2007). It was quickly followed by Wellman's first East York study and Fisher's Detroit and Northern California studies (Wellman, 1979; Fischer, 1982). These studies were persuasive enough in their depiction of personal relationships that a name generator was included in the 1984 American General Social Survey (hereafter the American GSS; Burt, 1984; Marsden, 1987).[4]

There are two strategies for deciding who to include in a name generator (Hogan et al., 2007):

1. Free recall with defined scope conditions. This is the approach used in the interview. The scope condition is that individuals have to be close to ego. Another scope condition is "people with whom you discuss important matters". This was the scope condition used in the American GSS.

2. A range of questions designed to elicit a diversity of supportive alters. This is the approach used by Fischer. The respondent would be asked to name someone "who could loan you $500", or "who could babysit your children". This approach was also used in the fecund Social Survey of the Networks of the Dutch (Van Der Gaag and Snijders, 2005).

Once the names have been elicited, there are two additional common stages in the process. The first is edge-generating and the second is name interpreting. The edge generation stage is widely acknowledged to be a slow and onerous task (McCarty and Govindaramanujam, 2005). It is traditionally done using a triangular matrix. The names of the alters appear in the rows and the columns of the matrix. For each cell in

[4]To give the reader a sense of the potential impact of name generators, the 2004 American GSS included a name generator identical to the one used in 1984. Researchers comparing the two noticed a clear and distinct decline in the number of core network members (McPherson et al., 2006). This led to a mainstream media frenzy about social isolation in America in the summer of 2006, with stories in many major American newspapers (e.g., Piccalo, July 23, 2006; Vedantam, June 23, 2006).

the matrix the interviewer asks, "Does A know B?" or "Are A and B close?". The question is usually designed to be symmetric, meaning that if A knows B, B also knows A. This way one only has to ask half as many questions. The matrix method worked fine in the General Social Survey since each respondent could only list up to six alters. The formula for determining the number of questions is n(n-1)/2. Thus the GSS needed to ask a maximum of 15 additional questions. The Connected Lives interview was meant to capture a much wider scope of alters. Given the distribution of somewhat close and very close alters, as well as past work on network size by McCarty (2005), we opted to use a maximum of 66 alters. If a respondent named this many alters (as four members of the interview sample did), it would lead to 2145 unique questions of the form "Does A know B". This was considered unduly burdensome. For this reason we opted to use a more visual approach to edge-generation.

Rather than writing down names on a single sheet of paper, we designed a name generator template that allowed individuals to write down names in an orderly fashion, but then rearrange the names afterwards. This template (as seen in Figure 4.2), includes a center layer on which we lay 66 small "Post-Its®" (hereafter referred to as name tags). Thirty-three on one side are colour coded and marked as 'very close'. Thirty-three on the other side are in a different colour and marked as 'somewhat close'. To keep the name tags in place, we used heavy cardboard plates with windows cut out. This allows the person to see most of the name tag, while keeping the loose edge of the name tag snugly in place. The cardboard plates were attached with binder clips so that once the respondent had finished writing down names the interviewer could remove the plates allowing the participant to easily pick-up and rearrange the name tags.

We asked respondents to lay out the name tags on a large 17" by 22" inch sheet (which is the same as 2-by-2 letter-sized sheets). On these sheets, we had printed concentric circles two inches apart. Since the name tags were 1.75" long, this meant

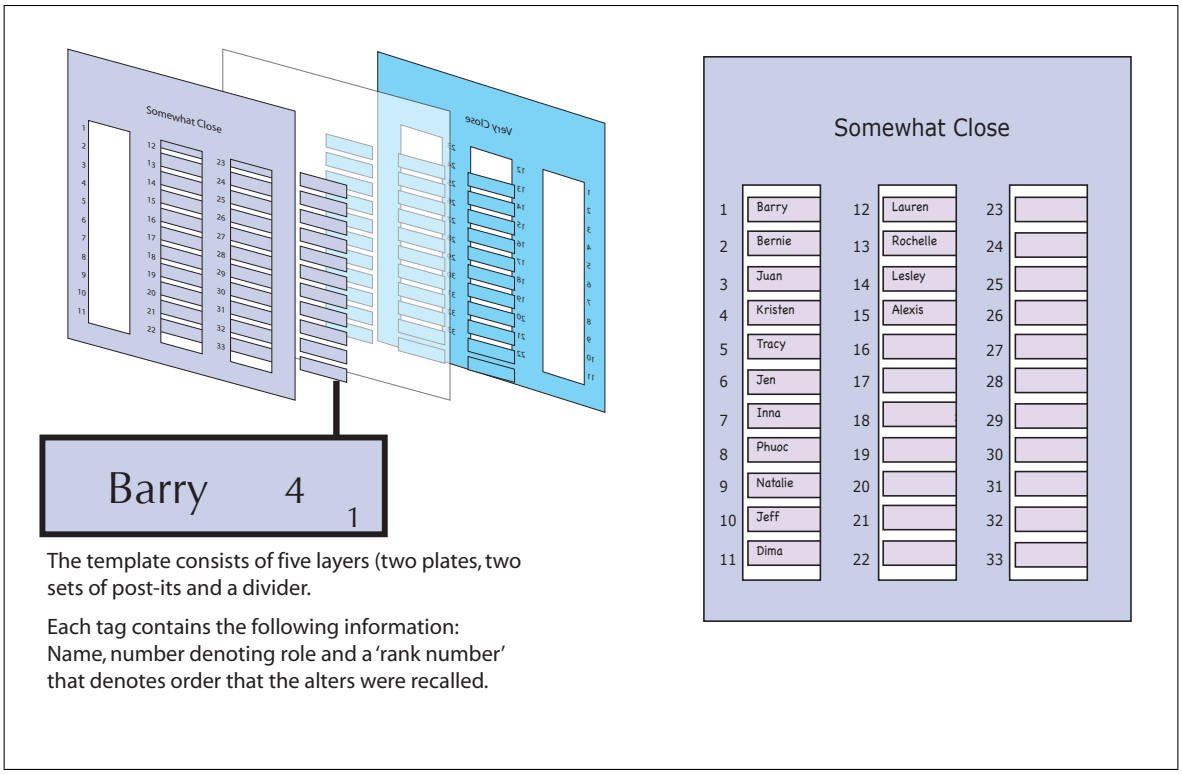

Figure 4.2: Schema for name generator template design

that the respondent could lay the name tags on the rings without overlapping between rings.

Individuals were given only two instructions for laying out the network. The first was to place those who were closest to themselves closest to the centre and the second was to place people who knew each other closer together. These instructions made it easier to draw edges between people once the network was arranged on the page. Respondents were given a chance to tweak the arrangement until they were satisfied.

While we believe we had independently stumbled upon the idea of using concentric rings of closeness, a subsequent literature review of social network techniques revealed at least three prior instances of this kind of work. One was done in the laboratory (Freeman, 2000) and two in the field (Antonucci, 1986; Spencer and Pahl, 2006). Of the two who used this work in an interview setting, neither had included links between participants, nor had either of them developed a reliable means for sampling

within these networks. We consider this independent use a testament to the underlying logic of using this particular method.

One of the advantages of performing this task is that laying out the alters on the concentric rings allowed individuals to reassess the closeness of a tie. Individuals commonly deliberated on whether a tie was somewhat or very close. In this case, they were able to place a tie on the middle ring between the closest and the least close individuals. This also gives us a secondary measure of closeness which I suggest is more accurate than a strict dichotomy. The consequences of this are discussed in the interview results section below.

Once the name tags were arranged on the paper, the interviewer asked respondents to draw edges between the individuals in four steps:

1. Draw a circle around alters who were all very close with each other.
2. Draw edges between pairs of individuals who were very close with each other.
3. Draw a circle around alters who were all somewhat close with each other. This might include pairs of individuals who were considered very close, or even a subgroup of people who were somewhat close.
4. Draw edges between people who were somewhat close to each other.

These steps are also shown in 4.3 which is a stylized version of the actual network and layout of one of the participants (#232).

The colour of the pen used for the somewhat and very close edges corresponded to the colour of the somewhat and very close name tags. This sort of 'mapping' (Norman, 1990) was meant to make the task more straightforward.

The governing logic of this process was that individuals need only indicate which ties were present, rather than being asked about all potential ties. Also, by encircling sets of individuals, the respondent could cut down on both the number of edges drawn and the visual clutter. The steps for denoting edges was based on the idea that very close cliques and dyads are more likely to be nestled in somewhat close cliques,

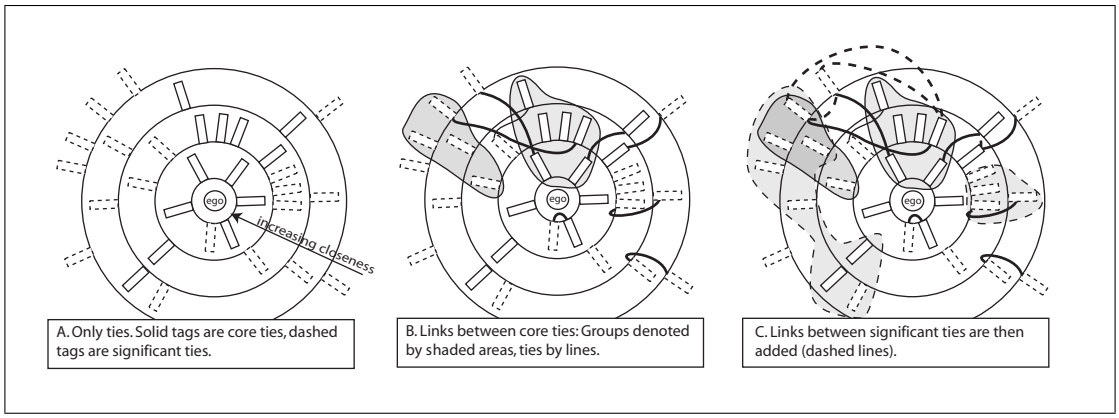

Figure 4.3: Stylized version of the process of drawing edges according to the steps presented.

than vice versa. This is in keeping with Granovetter's theory of triadic closure as well as prior research (Granovetter, 1973; Kalish and Robins, 2006).

Individuals generally considered this to be an unexpectedly fun and interesting task. This is very novel for social network research, as the previous matrix questions were considered monotonous and burdensome. Ethics reviews commonly ask what benefits will come to the respondents from participating. A common 'canned' response is personal insight. I believe this technique makes good on that assertion.

The third stage of a name generator involves name interpreting questions. These are questions designed to elicit additional data about the alters as well as data about the relationship between ego and alter. In the Connected Lives interviews we opted for detailed description about specific alters to superficial description about all alters, with two exceptions, gender, and role, which we captured for all alters in the network. To select the specific alters we designed an algorithm for sampling alters. We asked interviewers to select the three closest alters, and then select the alter that was elicited first from each ring. We could tell which alter was elicited first because each name tag had a tiny number in the corner numbered from one (the first alter elicited) to 33 (the last alter). The interviewer continued to select the alters with the lowest number until 15 alters were selected, or the interviewer ran out of alters to select. The number 15

was chosen based on prior research suggesting that given the opportunity, individuals are most likely to abandon the name interpreting process after 15 alters (Manfreda et al., 2004). Finally, if an alter was married to one of the alters that was already selected, they would be excluded. Additional details about this process are given in Hogan et. al., (2007).

For each of the selected alters, the interviewer asked a series of questions about the alter's demographics as well as questions about media use with that alter. The specific instrument used (internally referred to as the 'minisurvey') is shown in Appendix B.

In practice, the minisurvey was so onerous that many interviewers reduced the number of individuals sampled in the minisurvey from 15 to 11 or 12. This was because there was almost 40 minutes of interview that had to take place after the minisurveys were completed, and interviewers were concerned about respondent withdrawal. Nevertheless, the sample of alters selected from the minisurvey is considered to be a faithful representation of the full network. As reported in Hogan et al. (2007), the sampled alters do not differ proportionately from the rest of the alters in terms of gender, ring or role, with one exception. There were more extended family members in the networks than in the sample. I assert that this is because individuals are especially prone to including the husbands and wives of extended family members, yet we could only include one of a couple in the minisurvey sample.

4.7.6 Interview Results

The results of the name generator show networks that are slightly smaller than those given in the survey. As expected, there is still a positive skew for both very and somewhat close alters. This is reinforced by the fact that the networks had a mean 11.6 very close, 12.2 somewhat close and 23.8 total alters, even though the medians were 10,10, and 21, respectively.

Table 4.4 shows the distribution of very close and somewhat close alters by ring.

Closeness Number of alters	Very Frequency	Somewhat Frequency	Total Number of Alters	Frequency
0	0	2	0	0
1-8	37	32	1-16	33
9-16	34	33	17-32	34
17-24	8	11	33-48	14
25-32	4	3	49-65	2
33	3	5	66	3
Total alters	999	1045		2044
Mean	11.6	12.2		23.8
Median	10	10		21

Table 4.4: Name generator network size by ring, for very close, somewhat close and total alters

As expected, many very close alters are also present on the second ring. More curious is that 9 percent of alters initially labeled very close appear on the outer third and fourth rings. However, the 0.5 percent of very close alters placed on the outer ring come only from four respondents, two of whom have three very close alters on the fourth ring and two who have one. These alters are consistently among the lowest ranked very close alters (such as the 17^{th}, 20^{th}, and 21^{st} of 21 very close alters), and they are not connected to the largest component.

Ties labeled 'somewhat close' are well distributed across rings two through four, with most on the third ring. There is some cognitive overlap between the weakest very close alters and the strongest somewhat close alters, a feature that is captured in the four ring schema. Like the small number of very close alters on the outer ring, the five percent of somewhat close alters on the inner ring were rarely connected to the largest component. But unlike the marginal very close alters, these few somewhat close alters who are on the inner ring were recalled early in the name generation process. As such, I suspect they are actually very close alters who were inadvertently omitted during the very close naming stage *because* they are not connected to other very close alters.

Disparities between alters who are initially labeled as 'very close'/'somewhat close'

and later placed into more finely grained division by rings reveal an interesting difference in perceptions of socioemotional closeness. When the respondent is first asked to name individuals as 'very close' or 'somewhat close', the respondent only considers her individual relationship to each alter. However, when the respondent has to arrange these names on one sheet, she must assess the closeness of alters in relation to each other. At this point, the respondent often promotes some alters to the inner rings and demotes others to the outer rings. Capturing the respondents behaviour thus shows a benefit of participant-aided visualization: *Arranging the alters in an overall structure induces the respondent to think about individuals in relation to each other.* This is relevant to the eventual analysis, as one of the key research questions in Chapter 7 is whether media use varies by closeness of the individual. By having this second check on socioemotional closeness I believe I am in a better position to test this claim with validity.

There is much variation in the structures of the networks. This variation can also be described quantitatively. Here I focus on the number of components and the density of the overall graph.[5]. For both measures, ego and ties between ego and alters are excluded. The mean density of the 86 networks is 0.17, which increases to 0.30 when isolates are excluded.

There is a clear negative correlation between density and the number of alters($r = -0.38, p < 0.001$). This is because density is simply the number of ties divided by the number of possible ties. As the number of alters increases linearly, the number of possible ties increases geometrically (since density is a function of the number of alters squared). So it becomes increasingly less likely that the number of ties will stay proportionate to the number of alters. There is also a strong positive relationship between

[5]A component is a sub-graph that has no connections to the rest of the network. Strictly speaking there is only one component in a personal network, since ego is connected to everyone. By removing ego, it is possible to get a better sense of the personal network that affects ego, rather than ego's effect on the network (see discussion in McCarty and Wutich, 2005) An isolate is an individual who is unconnected to the rest of the graph. It is also the smallest possible component.

the number of alters and the number of components in a network ($r = 0.71, p < 0.001$). The relationship between network size and the number of components persists when isolates are removed ($r = 0.72, p < 0.001$). This means that larger networks do not necessarily have more isolates that skew the number of components. Instead, larger networks have a greater number of separate groups.

4.7.7 Comparing network size across the two methods

There is a strong correlation between the network size produced by the summation method and that produced by the name generator method ($r = 0.67$, $p < 0.001$). That is to say, people who say they have few alters on the survey, mention only a few during the interview; those who say they have many on the survey, mention many during the interview (Figure 4.4). The strength of association is higher for very close alters ($r = 0.74$, $p < 0.001$) than for somewhat close alters ($r = 0.49$, $p < 0.001$). This means that the responses given for very close alters vary less between the survey and the interview than responses for somewhat close alters. Respondents seem to have surer grounds for deciding who their very close alters are than their somewhat close alters.

Although the number of alters produced by the name generator and the summation method are strongly correlated, respondents routinely mention a greater number of network members when they use the summation method. To estimate the difference in magnitude, I use bivariate linear regressions with no intercepts. Using this measure, the coefficient for the independent variable indicates how far the dependent variable deviates from the diagonal (1:1 relationship) conditioned on that variable, and the R^2 measure indicates the variability of this deviation. Respondents name 1.25 'very close' alters on the survey for every 'very close' alter on the interview and 1.64 'somewhat close' alters on the survey for every 'somewhat close' alter on the interview. In total, they name 1.47 alters on the summation method for every one on the

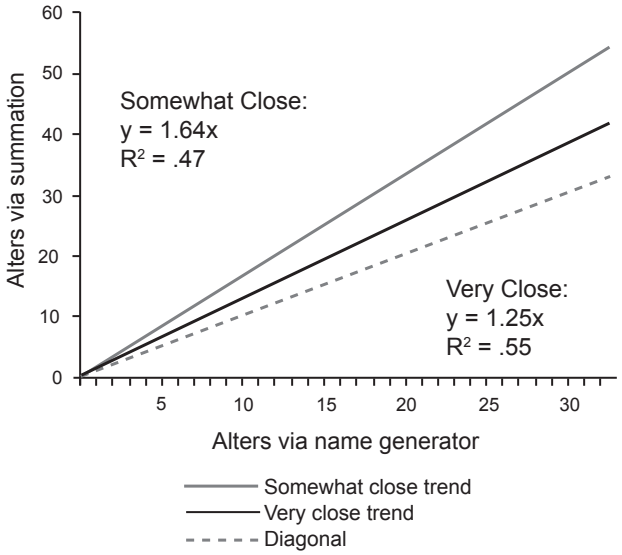

Figure 4.4: Predicted values for number of names recalled using the summation and name generator methods

name generator ($R^2 = 0.78$). It is not surprising that respondents disproportionately name more somewhat close alters on the survey, and have more variation in the number of somewhat close alters named. While very close alters are defined by specific criteria, somewhat close alters are defined in the survey as simply "more than just casual acquaintances, but not very close". By contrast, interview respondents have to actually *name* their alters instead of giving an approximate count. As a result of this procedural difference, respondents are choosier in the interviews about which alters are somewhat close. Moreover, as mentioned above, some survey respondents round off large counts on the survey.

4.7.8 Media use—measures and interpretations

Much like the measurement of social networks, there are a multitude of ways for measuring media use. These measures are complicated by the almost necessary act of considering media use temporally. As Zerubavel (1982) notes, there are four dimensions to the social structuring of time: sequence, duration, temporal location (when in

clock time) and recurrence. One can measure media use according to each of these dimensions, both in terms of aggregate media use, and media use with any individual. Someone might regularly call their parents, but only do so at a specific time of the day for a specific duration.

One of the most accurate means for representing activity is to use a time-diary (Michelson, 2006). This technique, however, is very involved and is meant to capture an intensive picture of an individual's day. This study, on the other hand, needs to assess the extensive use of many media with a number of alters. Since one interacts with only a fraction of one's personal network on a given day or in a given week, it is necessary to use more crude categories. Both the survey and the interview use ordinal scales of frequency, generally in some variant of "daily","weekly","monthly" and "yearly".[6] To reduce the complexity of models using these ordinal responses, I have converted these to either days or times per month. This enables me to use regular parametric models, rather than more complex and often less accurate nonparametric equivalents.

Also, it is important to distinguish the kinds of media use for a given individual. The time spent per day on the Internet is not an accurate measure of the time spent on Internet-based social activities such as email and instant messaging. Some individuals may spend most of their time online playing solitary games while others may only go online once a week, but do so explicitly to check their email. The same can be said of mobile phones. Some individuals may spend a substantial amount of time having expressive conversations with a single alter, while others would be able to have many short instrumental conversations using the same number of mobile phone minutes. For this reason, the media use measures in this study will be fit to the research question where possible. In Chapter 5, I examine the relationship between social activity

[6] I say "some variant" because several survey instruments also included mid-points, such as "more than weekly" and "more than daily". The specific responses vary and are explained in-text alongside the measures where relevant.

and the media used to organize this activity. Therein, the measures is based on the number of times per month an individual uses a particular medium to plan (i.e., to use a medium instrumentally). By contrast, Chapter 7 focuses on the overall number of media that individuals use to access their alters. There, a simple dichotomous measure of use/non-use is sufficient. Additional details about the media use measures are explained in the respective relevant chapters.

Chapter 5

Network profiles: Coupling media use and social activity

5.1 Introduction

In 2003 a hundred people barely known to each other descended on a Macy's department store in Manhattan for a brief public spectacle. In the back of the store, over a hundred people huddled around a very expensive rug. Besides showing up, their only instructions were to claim that they were part of a rural collective and all decisions especially ones on such an expensive goods were to be made as a group. For fear of blowing their cover or aggravating the store owners, the group quickly dissipated back to their everyday lives (Rheingold, 2003).

This incident was considered the first of many 'flash mobs', a fleeting trend among highly mobile urbane folk to spontaneously gather for absurdist spectacles while savoring a taste of prankster community. Flash mobs represent an excellent example of media and social activity coupling. The affordances of cell phones allow people to be contacted regardless of place and time. So with little warning, those who signed up for a mob over the Internet would be given instructions via SMS to be at a certain place at a certain time plus some hint about the event such as 'bring a pillow'. Had the instructions been sent via email, fewer individuals would get the message on time. It could barely be done by telephone as it was a text based message and calling

that many individuals so close to an event would not scale nearly as effectively as broadcasting a single text message to all the potential and willing participants.

Five years later, the popularity of flash mobs are waning. Like streaking, it was a clever and fleeting cultural trend that could get old quickly. But in their wake we are left with a sense of how assuredly flash mobs are a social spectacle of their time. They represented a coupling of mobile phone/text technology and a specific activity that needed these affordances to be executed quickly and discreetly. And they needed a technology that was sufficiently well diffused that virtually any brave soul who wanted in was sure to have a phone at their disposal.

The coupling of technologies and social activities in flash mobs is rather obvious. Yet there is a similar logic that underlies the coupling of technologies and activities in everyday life. But where flash mobs are rare and very precisely coordinated, most social engagement is frequent and far more loosely coordinated. There are multiple paths to the coordination of social activity. Someone may plan a dinner with a friend over a phone call, follow up by emailing some other friends to attend and finally create an event in one's calendar that is then digitally shared with all the invitees. Alternatively, one may socialize by showing up for church on Sunday, just like any Sunday, and then staying for a dinner party afterwards, just like any Sunday. These activities demonstrate both a social activity profile and a media use profile.

In this chapter I assert that the one constant in social activity is "arrangement". Events do not spontaneously happen. Rather, they are a blend of space-time fixity and negotiation. Space-time fixity is the idea that certain recurring events are generally fixed either by being at a particular place, a particular time or both. Negotiation is the process by which individuals reduce uncertainty in future social activity by iteratively clarifying the specific time-space coordinates of the meeting. Most importantly, different styles of social activity entail different levels of arrangement. It is not merely that different events have differing levels of arrangement, but rather, that individuals

are prone to arranging their lives to different extents.

This story is at odds with the traditional notion of social engagement as a group-based phenomenon. Group-based networking requires a high degree of time-space fixity, since it is difficult to constantly negotiate with everyone. Thus, voluntary associations routinely meet at a fixed time, such as Sunday evening. In fact, one of the core ways in which individuals indicate their adherence to larger group norms is through their adherence to the temporal rhythms of larger social groupings. As Zerubavel notes, the Durkheimian distinction of sacred (meaning large social groups) and profane (meaning the private individual) is not simply a distinction in space, with sacred and profane sites, but it is also a distinction in time (Zerubavel, 1985, 1989). In fact, not only is the seven-day cycle of the week religious in origin, but so is the modern calendar. But the idea that most social activity is routine and rhythmic is itself waning. The calendar and the week are not transcendental constants in everyday life. They are socially constructed conveniences for the synchronization of social activity. They are temporal affordances. And as pointed out in Chapter 2, other individualistic temporal affordances are emerging—the affordances of new media.

Since these new media offer perceptual cues for negotiating time and space, they can circumvent the staid and fixed rhythm of the calendar in favour of ad hoc and contingent social engagement based on the continual individualized arrangement of everyday life. New media technologies offer individuals new paths to the arrangement of everyday life. By virtue of their unique affordances, new media create new perceptual cues about social structure—they offer lists of "friends", signifiers of a friend's availability, access to individuals within broad time-windows rather than at specific times, and access regardless of place. As such, they provide a great deal of possibilities for new and more complex ways of arranging events.

So who uses these media to arrange their everyday life and who does not? Recall that noted ecobehavioural scientist Roger Barker suggested we can learn more

about the behaviour of individuals by the settings they are in than the psychological attributes of the individual (Wicker, 1979). Similarly here we can learn more about the arrangement of everyday life by looking at the social activities they engage in than by examining the sociological attributes of the individuals. Granted, such attributes (e.g., income, gender, and relationship status) will come into play. They can often illustrate social constraints (like not having enough money to travel), but the constraints only indirectly influence how and who uses what media. Not all youth use cell phones, not all mothers will socialize in the neighbourhood and not all academics are tethered to a constant stream of email. As such, I assert that the kinds of events people engage in, considered in terms of their time-space fixity, is a more direct influence on media use than the social attributes of the individuals.

In this chapter I argue that individuals have internally consistent and salient styles for networking. These styles are influenced by social location, but not determined by it. That is to say, networking is an attribute characteristic of an individual rather than a structural characteristic of a social network. People network in ways that make sense to them and in ways that are similar to many other individuals. They frequently have a preference for a particular media or a particular way of maintaining contact with others. To demonstrate this claim, I use cluster analysis to illustrate styles for media use and styles for social contact. I then use correspondence analysis to indicate the relationship between the media that are used and the activities that take place. I assert that the coupling between media use and social activities can be explained by the frequency of media use, as well as a preference for either ad hoc 'last-minute' networking or prospective, fixed scheduling.

The first germane outcome of this work is to suggest that scholars can reexamine how media use is studied. Rather than focus merely on the Internet or cell phones, this work demonstrates that by examining the two in concert I can provide a clearer picture of variations in use. These variations are not merely in the frequency of use,

but how this use is supplemented by other technologies, and how this use helps to facilitate specific kinds of social activity. Thus, this work will allow us to transcend an either/or dichotomy about Internet use and social isolation. In some cases, no doubt, individuals really are isolated online—they spend numerous hours consuming news, shopping, gambling or viewing pornography. Yet, this does not negate the fact that the Internet can be a useful addition to other means of maintaining contact in everyday life (Katz and Rice, 2003). And rather than isolating individuals, it can in fact allow for great social accessibility. By refocusing the lens of inquiry onto individual networking patterns and away from the media themselves, we are in a position to better examine how the Internet is 'used' rather than judging what the Internet 'is'.

The second germane outcome is to refocus the debate on social isolation more generally. By showing how media use and social contexts are used to maintain social networks, I will argue that it is not enough to merely show that 'larger networks' or 'diverse networks' mean better outcomes. Larger networks are simply associated with very active schedules, a great deal of planning, and a significant investment of time. Some individuals may argue that the investment is not worth it, or that there are diminishing returns. Others may agree that large networks are beneficial but not know how to go about growing their network aside from collecting friends on Facebook. Without providing a solid link between larger or diverse networks and *how* people network, it is insufficient to demonstrate the links between social networks and positive outcomes. I will merely be validating those who already benefit while providing no actionable insights for those in need of better network management, or easier access to the appropriate arenas for networking.

The story would not be sociologically complete if I sought to reduce networking to psychological preferences. However, it would be academically naive to suggest that social forces can fully explain how individuals network. I take a middle path between psychological or sociological reductionism by suggesting that however in-

dividuals decide what is an optimal strategy it is nevertheless stable and consistent, and it is mediated and constrained by social forces. For example, many mothers enjoy networking via telephone and with neighbours. The social constraints of having children playing in the neighbourhood is a powerful force that persuades many mothers that this is a sensible strategy. However, there are many other suburban mothers who value their career first, can afford daycare, or simply do not like enlisting the support of neighbours. Being a mother does not *cause* people to neighbour and privilege the telephone, but I can say that this life course stage constrains individuals in ways that make this particular networking strategy viable and frequently desirable.

This example reinforces the concept of a 'life style'. This refers to a consistent outlook on personal life course decisions and social activities (Michelson, 1970). It is constrained by opportunity structures but not determined by them. As Michelson muses,

> [w]e do not know, for example, whether a person will emphasize what would be expected from social class, from ethnic memberships, from age-group relationships, or any other relevant label, when it comes to behaviour within a specific setting. It is quite likely that two people with the same set of labels may regularly act very differently because of the individual priorities they put on the phenomena behind these labels. It is not the labels themselves which interact with the environment. It is the behaviour coming from one, some, or a blend of many labels which is actually what the environment must accommodate. *We should design for regular behaviour patterns* (1977, 27, italics added).

In keeping with this claim, I focus on the behaviour patterns first, and the socially significant attributes second.

This strategy is also in line with recent work on friendship by Spencer and Pahl (2006). After mapping the personal communities of individuals in Britain they noted

that people do not merely have networks of a certain size or shape, but that they express a *desire to maintain* networks of a certain size and shape. Spencer and Pahl refer to this desire as a friendship repertoire. Some individuals prefer intensive intimate networks while others prefer extensive networking across many groups. Unlike this work, they did not analyze the ties between friends nor the media use with friends. Yet, their work is an excellent step in a similar conceptual direction.

Finally, this work is partially harmonious with Wellman's trichotomy of 'door-to-door','place-to-place', and 'person-to-person' networking. Yet instead of suggesting a broad social shift from one kind to another, I contend that all these styles are present in everyday life. Person-to-person networking, characterized by individual technologies and fragmented networks, has emerged as an alternative style of networking, but it has not eradicated other styles. Wellman asserts that these styles are afforded rather than determined by technology. If that is the case, then it follows that not everyone will make use of these affordances and become networked individuals. Many will continue to use a more glocalized form of networking, or even maintain little box networks of local ties. Whether there has been a change in the proportion of these three kinds over the past 10, 20 or 100 years is outside the scope of this study.

5.2 Plan of this chapter

Results of this study are divided into three sections. The first section (5.3) is on media use for planning social engagement. The next section (5.4) is on social activities that individuals engage in. The penultimate section (5.5) discusses the coupling between how media are used to plan and the sorts of activities people participate in. The chapter concludes with a summary of findings and a segue into the next chapter's discussion of networking and social structure.

Before proceeding, I offer a word of caution on the findings presented in this chapter. These findings are primarily derived from a one-time survey of individuals in

which the media use questions and the social activity questions are not directly linked. For example, I do not have a direct measure of how often one uses email 'to plan with neighbours' only that some individuals 'plan by email' and 'socialize with their neighbours'. Accordingly, the couplings described in this chapter are inferential. One may drop-in and use cell phone, but do so with completely different members of one's personal network. To work around this constraint, I will include supporting evidence from follow-up interviews where appropriate. Furthermore, the next chapter explores this issue in greater detail whereby I use ego-centered network analysis to examine specific media use with specific individuals, rather than general media use with all members of one's personal network.

5.3 Individual variations in media use

The standard quantitative approach of an analysis of social technologies is to consider them in isolation, or use one to predict the use of the other. This strategy is often packaged with stern disclaimers that one is exploring correlations, and not causation. Yet, the strategy itself sneaks causation back in by making the technology the focus of inquiry rather than the user. In this vein scholars ask questions such as the "Internet's *impact*" on social networks or the "role of the cell phone" in social coordination. Yet the Internet is not a single technology, nor is it interpreted in simple ways by all users. Rather, it is a nexus of social affordances for transmitting information and facilitating communication. Some users will especially enjoy the fact that emails can include photo attachments while others will not bother. Some users will appreciate that cell phones allow for easy accessibility while others will keep them in a car only in case of emergency.

Conceptualizing media use combinations as person-specific profiles is a recent approach for social scientists. Heretofore, scholars have primarily examined individual media separate from one another (Howard, 2004). When done in combinations, there

is little weight given to the idea that different frequencies of use constitute different profiles. Rather scholars will look at who uses the Internet, a mobile phone or both, giving little regard to the fact that some individuals may use both very heavily while others may use one significantly more than the other (Madell and Muncer, 2005; Rice and Katz, 2003; Boase et al., 2006). For example, Haythornthwaite examined the multiple media used by distance learners to uncover a pattern whereby stronger ties used more media with each other (Haythornthwaite, 2005). Yet she did not articulate specific profiles of individuals who would use specific combinations of media, only counts of media between dyads. Similarly, Carrasco and Miller (2006) examined which media had a complimentary or substitutive effect on social activity travel, yet each media was considered separately in a structural equation model.

There is nonetheless, some recent work in this direction. A recent offering in this vein by Kim et al. examines what they refer to as configurations of media use (2007). These configurations refer to the fact that certain media are not only used in combination with each other, but also tend towards specific roles. While the authors did not use k-means cluster, but rather a very interesting permutation of network analysis, the logic behind that paper is very much aligned with this work. However, where this work differs from theirs is in the focus on *personal* styles rather than *cultural* configurations.

In contrast to these approaches, I shall explore clusters of media use with the intent of articulating specific internally consistent styles. Granted, this technique is finding a parsimonious route to common styles, rather than articulating how each individual differs from each other. However, conceptually, this sort of technique is meant to differentiate signal from noise and illustrate general trends of media use that appear mutually reinforcing. Not every user will neatly fit into these styles, but certain clustering routines can still partition the sample into groups which are more similar within than between groups.

This is not only consistent with a social affordances approach to media analysis (Boase, 2006; Wellman et al., 2003; Bradner et al., 1999), but also in keeping with the hyperpersonal model (Walther, 2007) as well as the rational actor model (Madell and Muncer, 2005). Both latter theories propose that the actor makes sense of media use by fitting it into their everyday lives. To the extent that it fits, it will be used (Howard, 2004). It may extend and alter patterns of social activity, but it is done under the supervision of a rational actor that understands how certain affordances fit into everyday patterns.

A cluster analysis of media use is an ambitious task considering not only the frequency of use, but the fact that media are used for a variety of purposes. However, not all uses of media are equally relevant to this analysis. The biggest distinction is between the instrumental and expressive use of media. The instrumental use of media is about the goal-directed use of these media as a means to an end. By contrast, the expressive use of a medium is taken to an end in itself. For example, some email are merely gifts—cute messages with funny pictures or an interesting story whose sole function is to say "I think this is interesting and you might as well". These two uses are not mutually exclusive, but from a practical standpoint I believe it is best to focus on one or the other when assessing the coupling of media use and social activity. There are several key reasons for limiting the analysis in this way:

1. It places the spotlight on the Internet as a social technology associated with everyday social life. One may arrive at distinctly different conclusions looking at overall frequency of use than by looking at frequency of use for planning. Some individuals may spend many asocial hours online. While others may briefly use the Internet everyday, but only use it for social coordination.

2. The term 'making plans with' is general enough to cover many social interactions, but still maintain focus on managing social networks. Planning is oriented towards the future, and thus to an individual's willingness to carry forward their re-

lationships. People plan with those who they want to see and those who they expect to see in the future.

3. Planning is something that can be done by any medium or in person. Rich, poor, male, female, and so forth, everyone (except maybe the youngest child and the frailest elder) can plan. No doubt, the content and the context can vary dramatically. But one consistency is that an event *is* planned, regardless of what that event consists of.

This helps link media to the act of networking rather than mere passive consumption. Making plans and social coordination is not the only use of these technologies, but it is the use most obviously connected to in-person social engagements, and is a prominent use of these technologies (Ling, 2004; Campbell and Russo, 2003; Adamic and Adar, 2005; Boase et al., 2006; Quan-Hasse and Wellman, 2006).

The variables used to assess planning come from the Connected Lives survey. The specific questions are found in Appendix A, section 9. They are questions 9.59-9.64 and 9.69-9.74. These questions follow a brief section asking individuals to list the number of people in their network (the summation method covered in Chapter 4). So at this point the respondent has already thought about the set of individuals who are very close and somewhat close. These questions are preceded by a preamble: "Think about planning with all of the people who are VERY close. In total how often do you do the following...". The six questions that follow are:

1. Make plans in person
2. Make plans by cell phone (voice)
3. Make plans by cell phone (text)
4. Make plans by a regular phone
5. Make plans by email
6. Make plans by instant messenger

For each of the questions, the respondent can select

1. About daily
2. A few times a week
3. About weekly
4. A few times a month
5. Monthly or less
6. Never

This matrix is repeated with somewhat close alters. The ordering of the media is intentional. In person was assumed to be the most popular so it was considered first (as a reliable baseline). Then cell phone was presented before regular telephone so that there would be less ambiguity about what sort of phone a "regular telephone" is.[1]

For this analysis, I have converted the response categories to a temporal scale, where daily = 30, few times a week = 10, weekly = 5, a few times a month = 3 and monthly or less = 1. I then sum the very close value for each media with the somewhat close value to give an overall score. Table 5.1 summarizes the distributions of these scores. In the table I show the mean values for those individuals who use the media to plan, rather than the mean values including those who never use a certain media. This is important for some of the media such as texting. If I included all the zeroes, the mean would be artificially low. The table also includes the percent of the sample that use said media.

Through Table 5.1, all six media are used at least infrequently for planning. On average, individuals who use a medium to plan do it at least weekly. However, the high standard deviations point to large variations in the frequency of use. This is also reinforced by the fact that the median usage is much lower than the mean (meaning substantial right-hand skew).

[1]The term "fixed line" or "landline" telephone was not yet in regular usage, so we opted for "regular telephone".

Table 5.1: Media used in planning—Average times per month

	In Person	Cell (vox)	Cell (txt)	Reg. Tel.	Email	Inst. Msg.
Mean (of users)	11.1	10.3	8.0	12.4	8.0	9.8
SD	11.8	11.5	9.9	12.2	9.4	10.3
Median (of users)	6.0	5.0	5.0	8.0	4.0	6.0
N (of users)	299	160	57	312	201	46
N (% of sample)	92.0%	49.2%	17.5%	96.0%	61.8%	14.2%

In East York, the telephone is the most common way to make plans. The regular telephone is used by 96% of the sample, and used 12 times a month on average. This is followed by in person contact which is used by 92% of the sample who use it about 11 times a month on average. This chart also indicates that email is not used as frequently as other technologies. Superficially, this suggests that it is not as relevant as other technologies for planning. However, all other media are primarily dyadic in nature. The phone, the mobile phone and instant messaging all primarily take place between two people, whereas email can be distributed among many. It is this one-to-many affordance that prompted Boase et al. (2006) to uncover the major role email plays for those with particularly large networks. This claim is reinforced by the cluster analysis below.

The wide range in the distribution of media use (as evinced by the high standard deviations and discrepancies between the mean and medians) suggest that there is not a single established pattern of planning by any medium. It is a misnomer to talk about email users as a set or mobile phone users as a set. Instead, I shall partition the sample based on combinations of media use.

5.3.1 Clustering I: Introducing clustering

There are a number of possible techniques for clustering the sample, although the conventional techniques fall into three broad strategies. The first is hierarchical clustering. This technique calculates the distance between cases, and arranges cases in a

hierarchical tree with covarying cases branching off from the main trunk. It is a well established technique for assessing clusters, but it can make partitioning the sample into discrete styles difficult. Moreover, hiararchical clustering is not designed to partition cases, it is designed to show the relative distance between cases.

By contrast, partitional clustering algorithms such as k-means clustering are explicitly designed to partition a sample into mutually exclusive groups.[2] K-means randomly assigns k cases to be the center of k partitions, and then iteratively shuffles the remaining cases between these partitions until the mean distance to the centroid of each partition is minimized. While there is some arbitrariness in the ideal number of partitions, the technique is generally sound in determining which case belongs in which partition.

The third technique is to use genetic algorithms such as simulated annealing. The use of these techniques in exploratory sociology is still rare because their implementation is formidable, while their interpretation is often challenging. Their use is argued because other clustering algorithms are 'greedy', thereby leading to partitions that are locally optimal but globally suboptimal (Vaisey and Gersho, 1988). Since I avoid this problem by iterating through the clustering algorithm many times, the use of complex annealing algorithms is unnecessary (Fayyad, Reina, and Bradley, 1998).

Cluster analyses were done in R using the `cclust` package (Dimitriadou, 2007). Since k-means algorithms start with a random sampling of k observations, it is possible to pick suboptimal starting combinations. For every value of k from 2 to 12, I repeated the clustering routine 4000 times. For each value of k, I select the result with the highest result on a "goodness of fit" index. Here I use the standard Calinski-Harabasz algorithm to determine the cluster with the best fit. This algorithm uses the Sum-of-Squares of the distances between each partition in the cluster. Loosely

[2] A note on terminology is apt here. A clustering routine assigns cases into k partitions. The set of partitions is referred to as a cluster. So a cluster refers to the total solution, whereas a partition (or group) refers to an individual collection of cases that are similar to each other.

speaking, the higher the difference between the different partitions and the lower the difference within the partitions, the better the score (Calinksi and Harabasz, 1974).[3] This measure has been shown to perform optimally under a number of conditions including those relevant to the data set used here (Milligan and Cooper, 1985) when compared to other goodness-of-fit scores. Thus, a higher value indicates more differences between partitions relative to the differences within each partition. To note, it is frequently misunderstood that a higher Calinski score means a better match. This is only the case comparing along the same values of k (since according to the formula, all else equal, a higher value of k —more partitions— will lead to a lower score). However, if it actually increases, this is a good indicator that the cluster is optimal. Where it gradually decreases, one must take other measures into account. Here I look for the biggest drop in the largest cluster (i.e., the smallest set of partitions where the clusters are at least somewhat even in size). For each of the two cluster solutions presented here, I show a plot of the optimal solution for each value of k. These plots should make it clearer why I selected that particular value.

5.3.2 Clustering II: Interpreting the cluster

Results of the k-means analysis of the six variables for planning indicated that a six-cluster solution was optimal. For this analysis, the score for the Calinski-Harabasz gradually decreased as expected, but there was a steep drop in the size of the largest cluster between $k = 5$ and $k = 6$. Since there is only a slight decrease in the score, but a very large redistribution in cases, it appears to be the most parsimonious solution. Figure 5.1 plots these values across a range of k partition solutions.

The six different partitions are referred to by the amount of planning done through the most dominant media. They are as follows: "Heavy All Media", "Heavy Cell and

[3]The complete formula is $(SSB/(k-1))/(SSW/(n-k))$ where n is the number of data points and k is the number of clusters. SSB stands for the sum of squares between the partitions and SSW stands for the sum of squares within the partitions.

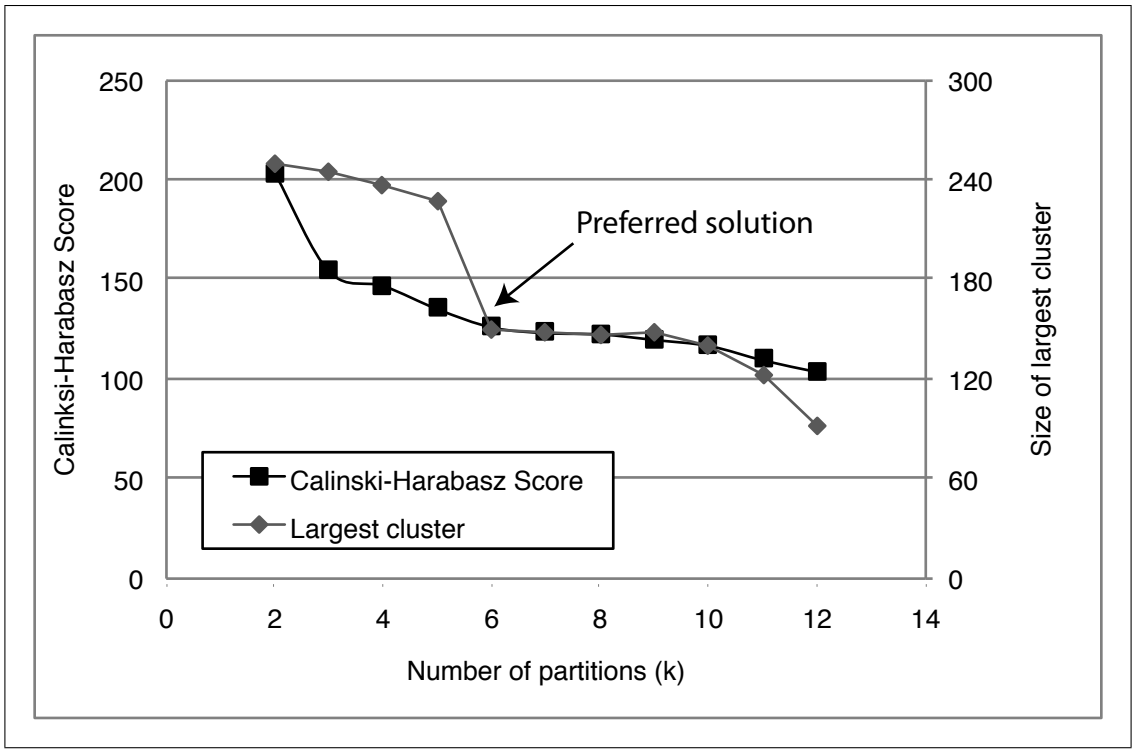

Figure 5.1: Calinski-Harabasz scores and largest partition size by values of k

Face-to-Face" (hereafter F2f), "Heavy Telephone", "Heavy F2f", "Moderate Telephone and F2f", "Light planning". I have ordered these groups by their total mean amount of planning (where "Heavy all" obviously does the most planning overall, and "Light planning" does the least. Neither group was particularly heavy in planning by email, cell phone (texting) or instant messaging, although the "Heavy all" group used email as frequently as cell phones. Also, it is worth noting that there was a lot of variation in the secondary media used in the "Heavy F2f", so that some of these individuals supplemented a lot of in person planning with email use, while others supplemented it with a lot of instant messaging use (and others, more conventionally used the telephone).[4]

In a sense, these media use partitions are media use "styles". These partitions

[4]This can be contrasted with the idea that people in this group used all media lightly but evenly—that was not the case. This was discovered through analyses of individual values as well as an assessment of the standard deviations of the mean planning values.

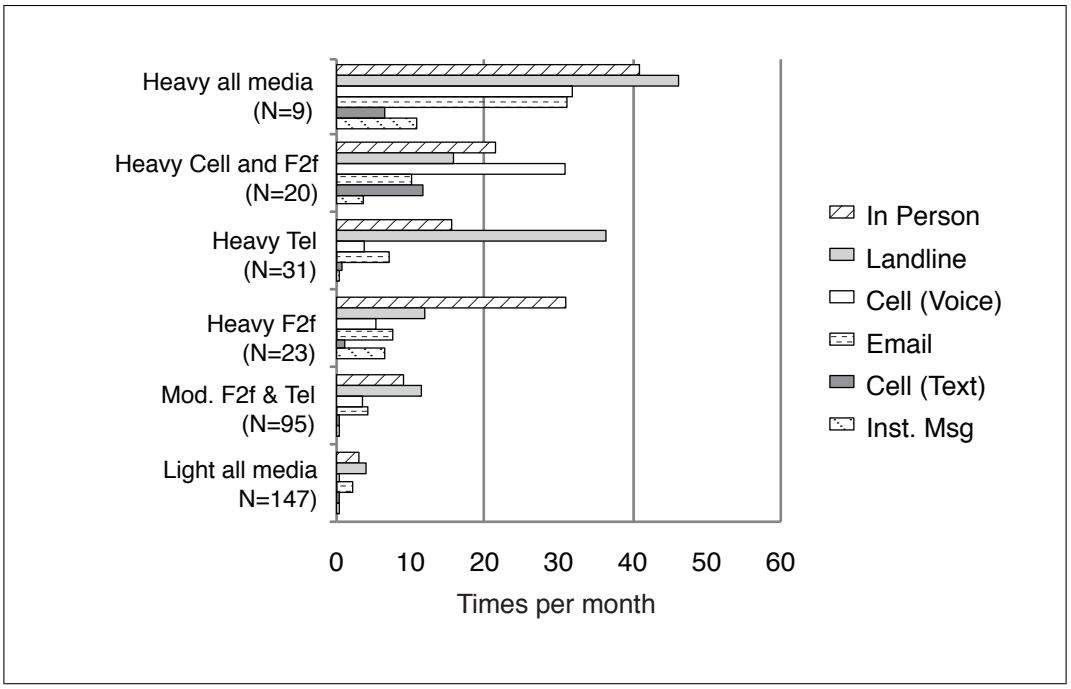

Figure 5.2: Mean values for planning frequency by cluster

represent a coherent set of media use habits. Each partition indicates a dominant medium (or media) that is consistently used in a routine fashion alongside secondary media that are used with greater variance. By virtue of having a medium "in one's toolkit" an individual has a particular level of access to alters, and is accessible by alter in a particular way.

These profiles do not represent absolute styles as there are countless other factors that are embedded in one's habitual media use. Nevertheless, these partitions differ substantially from each other and display a clear internal logic. For all partitions, planning in person and planning via the telephone figure prominently, although they decrease in frequency from one partition to the next.

Recall that these measurements were taken from an index of media use per month as there were two separate measurements per media, one for very close alters and one for somewhat close alters. Individuals certainly vary by the proportion of very close alters as well as the proportion of somewhat close alters in their networks. Granted, it is possible to look at even more complicated cluster solutions by splitting up (and

maybe weighting) the media use by somewhat close and very close. However, such additional analyses are considered outside the scope of this analysis since I am investigating an overall propensity to plan, not how clearly people demarcate who is the stronger ties (i.e. the very close alters) and the weaker ties (i.e. the somewhat close alters).

One thing one can notice in this chart is that as the clusters increase in activity, they decrease in size. That is, the largest partition is the substantial chunk of individuals who make plans with their personal network on a weekly basis or less. By contrast, the smallest partition is the one that has the most active planning habit. Selecting such a small distinct group ($N = 9$) is partially a quirk of the k-means algorithm, but one-way ANOVA tests confirm that the six groups differ from each other on frequency of use of all five media plus face-to-face ($p \leq 0.001$). Furthermore, post-hoc Bonferroni tests examining pairwise differences reveal that almost all of the partitions differ from each other on every medium, rather than having a single partition be responsible for the differences. Only in the case of instant messaging and texting by cell phone were several of the partitions not significantly different from each other.

As a consequence of this analysis I can say that those nine heavy media users really are distinct from the rest of the sample in terms of their active use of media. Also, the analysis indicates that there really is not that much distinguishing the 147 individuals in the largest and least active partition. Recalling Figure 5.1, I would have to double the number of partitions from $k = 6$ to $k = 12$ in order to dramatically affect the size of that largest partition, and even then, the largest two partitions are still substantively similar. What is more important is that the small group of nine "media omnivores" appear to do far more than their fair share of planning. I will return to this in the section below, as I suggest these individuals are probably the social hubs that link different groups together, and are generally very adept at "networking", in the common senses I referred to at the beginning of Chapter 2. For example, they do not differ signifi-

cantly in any of the demographic or social location variables—they are not a wealthy networking elite, but rather are distributed throughout various social locations and life courses. The one thing uniting them is their compulsion to be active with many network members in whatever way possible.

Another noteworthy finding is that there is no group that solely makes plans in person. The 'Heavy F2f' partition clearly does most planning in person, (mean 31.2 times per month), yet these individuals also use the telephone at least twice a week on average. Also, not a single case in this partition uses in person contact exclusively. It seems that if one is to be an active planner, *it must involve at least some mediated contact*. Furthermore, this "Heavy F2f" partition is second only to the media omnivores in their use of instant messaging. Only 9 of the 23 members in this group use instant messaging, but these 9 individuals use instant messaging at least three times a week on average.

5.3.3 Clustering III: Interpreting the social locations of the clusters

One question about networking styles is the extent to which they are reactionary responses to particular social situations, or more internally governed states of communication. For example, do individuals with more income plan by more media? Do women plan more then men, or older individuals plan using more traditional means than younger individuals? Table 5.2 shows the mean differences in numerous social location variables, as well as network size, and total propensity to plan. As can be seen from this table, the clusters do vary significantly on a number of variables. However, the relationship to social location is weak, as evinced by the lack of pairwise significant differences and the low significance of the ANOVA scores. If the relationship was strong, not only would the ANOVA model be significant, but pairwise comparisons within the ANOVA would also be significant.[5] Nevertheless, media use styles

[5]Pairwise comparisons were made using Bonferroni's post-hoc test.

do seem to vary by age, whether individuals have children at home and whether they are coupled. In general, older individuals, those with children and those who are coupled have different styles than those who are younger, single, and childless. Younger individuals clearly do more planning than older individuals, all else equal. However, the results are not as simple when considering single versus coupled and children versus childless. Relatively young single individuals are more likely to be mobile and plan using cell phone than those with children and couples. However, the media omnivores actually have the most children at home, and yet are less likely to be coupled than most of the clusters. This paints an interesting picture. Younger individuals are more prone to use a diversity of media. However, when these individuals have children—especially single mothers with children, they are prone to using these devices intensively to coordinate action with their network. To note, three of the media omnivores are single mothers, while the remainder are any combination of gender, having children and marital status.

Also, there is a clear significant negative correlation between age and total planning frequency ($r = -0.27, p < 0.001$). Interestingly, however, there is also a curvilinear effect of age. Those who are retired plan substantially more than their work-age brethren. This pattern is shown in Figure 5.3. The figure is a scatterplot of the number of times individuals plan per month by all media over age. Superimposed over this scatterplot is a quadratic (i.e., curved) trend line. Surrounding this trend line is the 95 percent confidence interval for the trend. This reflects a general life course tendency for individuals to be most active in planning when they are younger, decrease as they settle into middle age and child-rearing and then increase somewhat as children move out of the house.[6] This no doubt reflects two mutually reinforcing trends—that young

[6]It appears as if there are two outliers among the older individuals who are disproportionately responsible for the upswing among older individuals. This is not the case. Removal of these individuals does not significantly alter the shape of the line. This is reinforced by the 95 percent confidence interval around the line. Granted, the confidence interval does widen as age increases, but one can still observe a slight positive upswing even in extreme ends of the 95 percent range.

	Light all	Mod F2f/Tel	Hvy F2f	Hvy Te	Hvy Cell/F2f	Hvy All	Anova Sig.[a]	Anova Pairs
ANOVA label	A	B	C	D	E	F		
Mean age	47.42	44.27	42.41	45.71	37.75	35.62	*	ns
% in a house	0.56	0.58	0.5	0.35	0.45	0.67	ns	-
% child at home	0.46	0.52	0.39	0.29	0.25	0.67	+	ns
% employed	0.66	0.61	0.68	0.55	0.65	0.38	ns	-
% coupled	0.69	0.62	0.7	0.42	0.35	0.44	**	E < A
% male	0.43	0.43	0.57	0.29	0.6	0.22	ns	-
HH income (*1k)	66	77.1	64.64	71.97	56.33	63.21	ns	-
% Canada < 10 yrs	0.22	0.21	0.35	0.13	0.35	0.33	ns	-
# Very close	12.64	12.2	11	18	12.12	37.71	***	ABCDE < F
# Somewhat close	19.76	22.19	26.35	18.68	22.29	53.86	**	ABDE < F
# Total alters	32.39	34.38	37.35	36.68	34.41	91.57	***	ABCDE < F
Total planning	10.42	30.44	65.09	64.74	94.35	168	***	A < B < CD < E < F
N	147	95	23	31	20	9		

[a] Significance values: $^{+}p \leq 0.1, ^{*}p \leq 0.05, ^{**}p \leq 0.01, ^{***}p \leq 0.001$

Table 5.2: Descriptive values of social location variables and planning by media cluster

people adopt more technology more rapidly and plan more frequently. The second trend is that planning is constrained by the amount of time people have to do it. Middle age, being the most time-scare and harried period of life (Southerton, 2003; Robinson and Godbey, 1999), is also the time when there is the less social planning outside the home.[7] Individuals who are older still are less likely to be constrained by children, even as they become increasingly physically constrained.

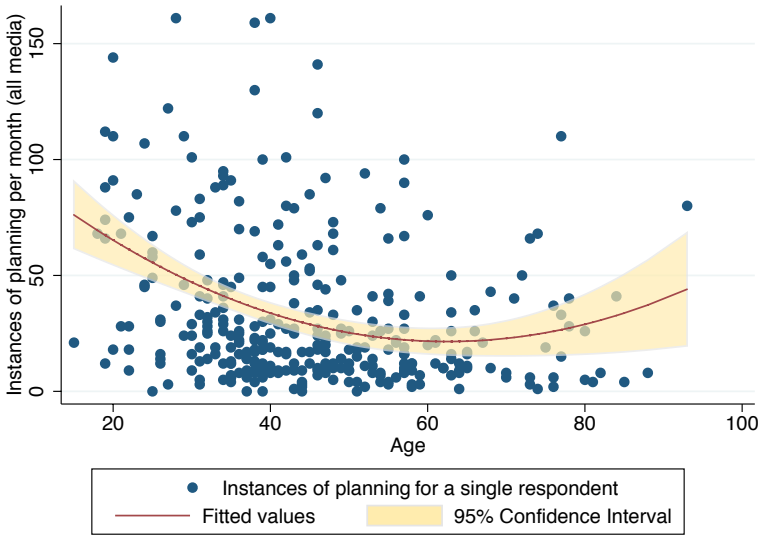

Figure 5.3: Distribution of planning frequency by age

Beyond age and time, there is one other very significant factor differentiating media use styles herein. The networks of the small group of media omnivores are particularly large. Overall, what distinguishes the media omnivores is not whether they have children or are single. Indeed, there are more single female parents in this group than one might expect by chance but since the cluster only contains nine individuals it is hard to confirm this result. The real difference is in the size of the network. The omnivores plan and are very busy, but this planning is clearly directed at engaging a

[7]It is worth recalling here that these figures are for planning with alters, in this case meaning individuals who the respondent voluntarily associates with and who do not live with the respondent. Middle-age, by contrast is a harried time partially because of the demands within the family, something which is not explicitly covered in this analysis.

substantially large swath of individuals, and by far and away a larger swath than one would find by chance.

By contrast, the network sizes of the other five groups do not differ significantly. One might say there is a substantive difference between the "Heavy F2f" partition and the others, since they have more very close alters, but their total number of alters is about the same as the other partitions (omnivores notwithstanding). Thus, one can see, that in East York, there is a general network size of about 35 members (using the summation method), with about 75 percent more somewhat close alters than very close alters. One's media use style does not seem to have a big impact on the number of alters, except in the case of the media omnivores who appear to use any medium at any time with many alters.

From the qualitative interviews, what stands out the most about the heavy media users is not their consistent social location, but the fact that participants in the heavy media group tend to have a blended home-work situation. For example, one is a student and single mother (#243 "Priscilla"), another is a self-employed concert promoter and sales director (#601 "Clay"), the third is a nutrition consultant (#431 "Wendy") and a fourth works two jobs, one as a PR person out of a home office (#672 "Hedda"). All four talk about how important email and cell phones are to set up meetings. The nutrition consultant was particularly sensitive to the complexities of scheduling and the useful affordance of multiple email recipients:

> With my two close colleagues at Ryerson [University], it's fairly constant. We're setting meetings, and someone has a problem so we change the meeting...and the other thing about emailing with my two colleagues is that if we ever have a two-way conversation, we make sure we copy the other. The dyad is never a dyad; it's always a triad (#431, "Wendy").

However, the complexities of planning by media might be best expressed by this frazzled quote from the promoter and sales director:

> I would wake up...on average every Monday to Friday, sometimes Monday to Saturday, around 8 o clock in the morning. I check emails, send faxes, a lot of voicemails at work...I plan my day usually in the morning, I should do it at night but I usually do it in the morning instead. I'm a night owl so I usually am out at a bar or at a club at night. So I do a lot of work in the morning and from my home, because I work from home...So in sales what I do is I I'm gonna wake up in the morning, get in my truck and make a lot additional phone calls confirming appointments for the day (#601 "Clay").

Here Clay mentions at least four media, (emails, faxes, voicemail, and calling). He also mentions texting, instant messaging and webcamming later in the interview. For Clay, networking is staying in motion and keeping up with whatever is necessary for both his clients and his peers. He typifies the 'all heavy' group as someone who is focused on maintaining accessibility and being a deliberate networker—even explicitly so:

> I: What's your most important work related task? P: Actually it's completely about what you're here talking about which is communication. You have to in sales be a good networker. Whether you want to talk to somebody, whether you want to go to that meeting, whether you wanna spend time making a powerpoint presentation or an excel file, you gotta keep in communication with your clients because the competition's right behind you (#601).

Clay is in the "Heavy Cell and F2f" group. Unsurprisingly, he could be a torchbearer for Ling's concept of "microcoordinators". Ling uses this term to describe the fast and loose networking of the mobile phone (Ling, 2004). For them networking involves many media, lots of scheduling and lots of uncertainty. The "Moderate F2f and telephone" group, by contrast, offer an extreme lifestyle counter point. Theirs is a world of regularity. They are second only to the "Light planning" category for being

infrequent planners, but that is not to say they are infrequent socializers. For example "Guy" is an elderly man who is disinterested in computers. One need only read his comparison of daily life to get a sense of how different his world is from Clay's.

> I get up at 8:00 and read the newspaper and do the crossword puzzle. Then some days there's a breakfast club that meets every Wednesday, and I go there on Wednesdays obviously. And I do Meals on Wheels another day, and there's a lunch group meets once a month, people I used to work with, on Tuesdays (#372).

Perhaps the only similarity is that they awake at 8. Where Clay is constantly trying to keep abreast of his work and social engagements, Guy reads the newspaper and makes sure that if it is Wednesday he is going to the breakfast club. And Guy's story is not out of sync with others in the 'light telephone' partition.

5.4 Individual variations in social activities

Planning gives us a glimpse of how individuals orient themselves to future states, how they react to their social structure and maintain their relationships with each other. Yet, planning is not directed towards a specific unique task but to multitude of tasks with a variety of alters. The one constant is merely the individual's will to seek out and engage others. Thus, to understand networking in everyday life, one must not only look at the medium by which planning is accomplished, but also the goals—what activities do people engage in?

5.4.1 Describing the social activity measures

Networking is not merely about the media used to plan activities, but also about the activities themselves. While the Connected Lives data set does not include a comprehensive list of possible activities, it does include a series of questions that get at several

dimensions of social activity. The questions and their respective descriptive measures are found in Table 5.4.1.

The criteria for selecting these activities was that they each have a different relationship to the aspects of structure outlined in Chapter 2. There, I categorized affordances according in four dimensions: information, relation, time, and space. The activities listed in the table all vary on these dimensions. Regular meetings are very fixed in time and likely fixed in relation. Neighbouring is very fixed in space, but can happen at any time of the day. Dropping in and hanging out are not fixed in time. However, dropping in is done with specific known alters (one drops in on a specific person), whereas hanging out is done with specific known places (one hangs outs at a context, such as a café, where a rotating set of individuals may be found).[8] Finally, online chatting is much like hanging out (where the chatroom or buddylist can be considered a context of rotating alters), but it transcends space.

Since this is a purposive rather than comprehensive list of activities, I look forward to future analysis drawing upon the findings here with a more comprehensive, perhaps time-use derived, list of activities and their frequency.

Much like the planning variables, these social activity variables are ordinal categories of time that being with "about daily" and end with "monthly or less". Also, like the planning variables, they were converted to numeric scores from the ordinal values. However, unlike the planning variables, there was no separate measurement for frequency with very close and somewhat close alters. This means that I did not sum two values (a value for very close alters and a value for somewhat close alters). So the frequencies here will be understandably smaller. Also, because it is only one global per-individual measure rather than a composite of two distinct measurements, I can refer to the values as days per month rather than times per month.

[8] To clarify some of the spelling herein, note that "hangout" is the noun phrase whereas "hang out" is the verb phrase.

Table 5.3: Selected social activities—Average times per month

	Attend a regular meeting	Go to a regular hangout	Drop in unannounced (or call ahead)	Have a chat with neighbours	Talk to people in an online chat
Mean (of sample)	3.5	3.9	2.8	10.9	1.7
SD	4.6	6.1	5.4	11.0	5.8
mean (of users)	5.1	5.5	4.5	11.6	8.8
SD	4.7	6.7	6.3	10.9	10.7
Median (of users)	Weekly	More than monthly	More than monthly	More than weekly	More than monthly
N (of users)	233	238	210	317	65
N (% of sample)	68.9%	70.6%	62.5%	94.1%	19.2%

Mean values were calculated from a conversion of ordinal scales into number of days per month. 'Of users' means the point estimate was calculated only for those who reported doing the activity at least once, whereas 'of sample' includes every valid response from the survey.

Of the activities, "having a chat with your neighbours" is the most frequent. However, that is not to suggest that it is the most salient aspect of networking. The respondents included an average of 3.3 neighbours in their personal network (0.9 very close neighbours and 2.4 somewhat close neighbours). The frequency of neighbouring, then, is more likely due to the convenience of seeing one's neighbour while outside, or the short traveling distance. Neighbours are easily accessed and accessible.

Of the remaining activities, the most popular was going to a local hangout, followed by a regular meeting, dropping in and finally chatting online. As was the case with the earlier discussion on media, the standard deviations are high, suggesting that individuals vary greatly in their styles of sociability. Also like the earlier discussion, those who participate in the activities generally do so more than monthly. Finally, these activities seem to have adequate coverage of the sample, as only 3 individuals reported 'never' doing any these particular social activities.

5.4.2 Clustering Part 1: Reintroducing clustering

The variables in this section are in many ways similar to those in the previous section on media use. I employ k-means clustering in similar ways (iterated runs with Calinski-Harbasz goodness-of-fit) to similar ends—clustering the social activity profiles into intelligible partitions. In the earlier clustering, there was a smooth decrease in the CH score, so I selected the cluster with smallest value of k after a big drop in the size of the largest partition. In this case, however, it is not so important to focus so much on the largest partition because the CH score actually increases slightly as the value of k increases between $k = 4$ and $k = 7$ (Figure 5.4). Starting with $k = 8$, the CH score starts decreasing while the size of the largest cluster remains virtually constant. Thus, $k = 7$ is the optimal cluster.

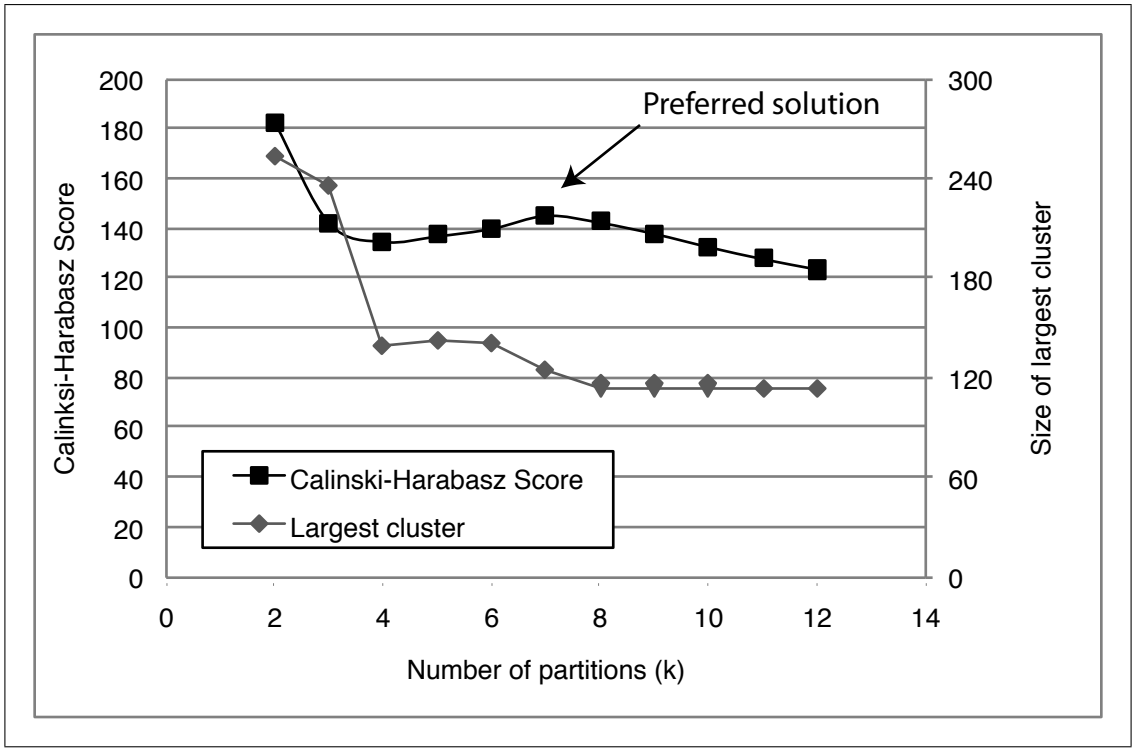

Figure 5.4: Calinski-Harabasz scores and largest partition size by values of k

5.4.3 Clustering Part 2: Interpreting the cluster

The seven partition solution is characterized by whether respondents do a particular activity daily, weekly or not at all. Accordingly, I have termed the partitions as "Monthly activity", "Weekly neighbouring", "Weekly meeting", "Daily neighbouring", "Daily online", "Daily hangout" and "Daily drop-in" (See Figure 5.5). Much like the earlier analysis, each partition is characterized by one or two dominant variables. However, unlike the earlier analysis, there is no "All social activities" group parallel to the "Heavy all media" group. This is probably due to the cost of in-person interaction. There are only so many places one can go in one day, and while it is easy to send off quick emails or telephone calls daily, activities like regular meetings, drop-ins and even chatting online can take upwards of an hour or more to complete (not including travel). Thus, one can see in these partitions a great deal of contour rather than a simple axis from low activity to high activity.

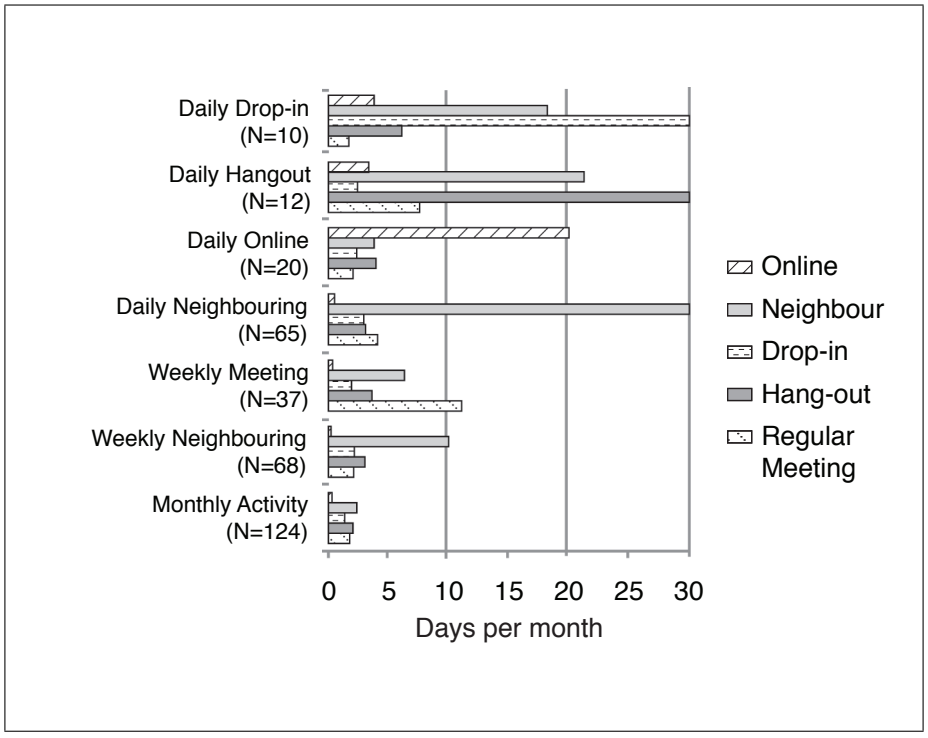

Figure 5.5: Mean frequency of social activity by cluster

What stands out firstly about these partitions is that numerous individuals have

a daily routine involving social contact. The 107 individuals in the "daily" clusters all interact by a specific primary means on a daily basis, be it neighbouring, online chats, dropping-in or hanging out. Interestingly, there is no daily regular meeting group. That is, regular meetings appear to be more of a weekly ritual than a daily one. Perhaps this is because regular meetings involve a specific organizational commitment that extends through the week, or because individuals can only participate in a handful of voluntary associations, each of which would meet on a weekly or monthly basis. By contrast, the networking strategies other than weekly meeting, are not as easily fixed in time, nor are they as dependent on large social structures. Consequently, I find an interesting relationship to planning in these social activity partitions. As can be seen in Table 5.4, there is a clear monotonic increase in planning from the "monthly activity group" to the "daily drop-in" group. What is noteworthy about this relationship is that planning variables were not included in this cluster, yet, the optimal solution shows a clear relationship to planning. However, it is not the case that more planning equals greater social outcomes. By contrast, it seems that individuals tend to eschew planning if possible and structure their social activity through more habitual and convenient means. I explore this concept further in the next section.

5.4.4 Clustering Part 3: Interpreting the social locations of the cluster

The six social activity partitions do differ from each other in a few salient ways. Many of these differences are significant, but others show either too much variance or too few cases to claim significance. What is important, however, is that the differences between the partitions illustrate a logic that ties many of the social activity patterns to the social locations of the respondents.

The core differences between these partitions is a relationship between social activity and individual opportunities. For example, the three partitions that neighbour frequently are disproportionately likely to live in houses rather than apartments. Does

	Monthly All acts	Weekly Neighbr	Weekly Meeting	Day Neighbr	Daily Online	Daily Hangout	Daily Drop-in	Anova Sig.[a]	Anova Pairs
ANOVA label	A	B	C	D	E	F	G		
Mean age	42.6	47.4	46.8	48.5	31.3	47.2	45.8	***	E < FBACD
% in a house	53%	65%	59%	66%	15%	33%	30%	***	E < BACD
% child at home	43%	54%	41%	54%	40%	33%	40%	ns	
% employed	69%	63%	70%	63%	56%	33%	30%	*	G < AC
% coupled	65%	76%	54%	60%	55%	58%	10%	**	G < BAD
% male	44%	41%	57%	29%	55%	33%	30%	ns	
HH income (*1k)	$62.0	$78.5	$89.1	$84.3	$32.0	$63.8	$22.8	***	E < BCD, G < BCD
% Canada < 10 yrs	0.30%	0.18%	0.14%	0.15%	0.75%	0.08%	0.1%	***	E > ABCDFG
# Very close	10	16	15	16	11	11	13	ns	
# Somewhat close	18	24	26	22	20	16	22	ns	
# Total alters	28	40	41	39	31	28	35	ns	
Total planning	25.8	30	34	38.1	53.4	69.1	80.3	***	G>ABCD, F>ABC, E>A
N	124	68	37	65	20	12	10		

[a] Significance values: $^{+}p \leq 0.1, ^{*}p \leq 0.05, ^{**}p \leq 0.01, ^{***}p \leq 0.001$

Table 5.4: Descriptive values of social location variables and planning by social activity cluster

this imply causation? For the sake of brevity, no. People may seek out houses because of the opportunities for neighbouring that houses provide. Yet there is a clear logic of houses affording greater opportunities for neighbouring, while apartment dwellers seeking to maintain personal boundaries. Groups A,B,C, and D are at least 50 percent home dwellers compared to 33 percent or less for groups E,F, and G. Similarly, the two neighbour groups (B and D) are most likely to have children, while B is the most likely group to be coupled. These neighbouring groups illustrate a pattern of social activity that hints at the "ideal type" of suburban life—neighbourly, family oriented and normative. Additionally, B,C and D are the most well off groups, and slightly older than average. By contrast, the daily online (E) and daily drop-in (G) groups are the least well off in the sample and the youngest. However, there is a great deal of difference between daily online and daily drop-in groups in the way they react to their circumstances. The daily online group is primarily young single poor immigrants with disproportionately large close families, while the daily drop-in group are either unemployed, or underemployed, and typically single. The latter group represents ideal-typical young networkers, tied to their cell phones and perpetually negotiating where to go next. Interestingly, despite the fact that this group does the most amount of planning, they are the least well off and the least likely to be employed—hinting at the fact that it is not how much one networks, but how they do it. This group stands in stark contrast to the weekly meeting group, who are financially well off, coupled, and home dwellers.

As this is a cross-sectional survey it is difficult to asses whether these patterns will persist over time—namely that the younger and less constrained perform a great deal of planning, dropping in and micro-coordination (Ling, 2004), while the older and the more settled do less planning, but instead structure their lives around convenient and rhythmic interaction. However, by positing that these are social activity behaviours tied to specific stages in the life course and one's personal constraints, it would appear

to be the case that these styles will persist regardless of the specific new media that are employed to sustain contact. So even if I cannot conclusively indicate how networking will evolve over time, it is still possible to construct rationales for certain kinds of networking in certain life contexts.

5.5 The coupling between media use and social activity

5.5.1 Conceptual grounds for the coupling between media use and social location

Respondents in both the media use and social activity partitions varied significantly on several measures. Both clusters showed variations in age, and each of the partitions varied on some social location variables that hint at reasons for the clustering solutions in the first place. Additionally, there were significant variations in network size as well as income and stage in the life course. However, eclipsing all these relationships is the propensity to plan.

Recalling the two social location tables (5.2 and 5.4), it is clear that the partitions in both the social activity and media use clusters can be easily ordered by their propensity to plan. This is not such a surprise in the media use cluster, since the propensity to plan is simply a sum of all the variables that went into the cluster in the first place. It was, however, unexpected in the social activity cluster.

Of all of the variables examined, planning appears to have the clearest link (if not the only one). One can observe this in the pairwise comparisons of planning in Table 5.4. In the order that I have presented them (from "light activity" to "daily drop-in"), each partition not only plans less than the next one, but each relationship is significant. Given that the social activity variables came before the planning variables, and the planning variables had no direct influence on the social activity clusters, this is a particularly noteworthy relationship. Thus it would appear that planning is a key distinguishing feature of networking in everyday life. This bodes well for the overall

thesis that networking in everyday life is shifting from a focus on space-time fixity to a focus on social access. This is because planning necessarily requires access. Either one has access through propinquity, through a specific media, through a peer or through a fixed place and time.

What is most interesting about the planning variables is that those who primarily drop-in and hang out do the most planning. That is, the pastoral "walk in the park", where people casually drop-in on others is not a prominent feature of everyday life in East York. Dropping in is itself an arranged activity. Which is to say there is evidence to suggest it is at least partially pre-meditated and based on one's intention to drop-in on a specific individual rather than simply stroll through the neighbourhood looking to find out who one can drop-in on. Similarly, the idea of hanging out conjures up thoughts of "Cheers", a mid-1980s show about regular patrons of the bar named Cheers. As the jingle goes, it is "a place where everyone knows your name". But that is the hangout of yore. Today's hangout appears to also be an orchestrated affair. Those who hang out daily are frequent planners using many media (particularly cell phones) to coordinate with disparate sets of individuals.

So, superficially, I have answered the question of who uses media to arrange their activities in everyday life. Namely, those individuals who have very contingent networking plans. Media use sustains dropping-in, hanging out and long distance relationships. This leads to the follow up question of "how?" It is clear from the above analysis that individuals plan using diverse media. It is also clear that those who plan using a great deal of media also plan very frequently, and of course, that media use can be segregated into discrete styles. So is it the case that there is a strong coupling between distinct media use styles and distinct social activity styles? Or, is it more the case that individuals have a general propensity to plan (meaning that while there are distinct styles they do not map neatly into distinct social activity patterns)?

Given that the media and social activity clusters are two categorical variables, one

Social activity partitions	Media use partitions: Light all media	Moderate f2f & tel	Heavy f2f	Heavy tel	Heavy cell & f2f	Heavy all media	Total
Monthly activity	65	32	8	7	4	1	117
Weekly neighbouring	31	18	3	7	1	1	61
Weekly reg. meeting	11	19	0	1	2	2	35
Daily neighbouring	22	18	3	10	5	1	59
Daily online	6	4	5	1	3	0	19
Daily hangout	2	1	2	3	2	1	11
Daily dropin	2	1	1	2	2	2	10
Total	139	93	22	31	19	8	312

Table 5.5: Contingency table of media use and social activity partitions

way to interpret the affinities between these two is to use the classic contingency table and examine patterns therein (Table 5.5), particularly if the table has a significant chi-square, as it does in this case ($\chi^2(25) = 76.8; p < 0.001$). However, interpreting contingency tables is a task fraught with difficulties based on the different sizes of the observed and expected proportions in each cell. For example, the table illustrates that the drop-in cluster is evenly distributed through all of the media use styles, and that one of the people in the heavy planning group curiously is also located in the light activity group (i.e., to what end is that person planning?).

To reduce the cognitive burden of scanning across a contingency table looking for cells that show disproportionate numbers of cases, I use a correspondence analysis. The goal of correspondence analysis is to take a contingency table and represent it in a lower dimensional subspace. To do so, correspondence analysis calculates eigenvectors that represent most of the information in the table in a handful of dimensions. Each dimension represents some relationship between the row variables and the column variables and helps explain overall variation in the table (Greenacre, 1994).

The attractiveness of correspondence analysis is not only because it represents tables in low-dimensional space (usually two or three dimensions captures 80 to 90 percent of the variation in the table), but because it can visually represent these dimensions. There are two approaches to such a mapping, which Bacher refers to as

the factor analytical approach and the cluster analytical approach (1995). The cluster approach is the more prevalent approach. Herein, one seeks to interpret clusters of related points. For this approach one generally maps the first two dimensions on a single xy plane. The first dimension is arranged on the x-axis and the second on the y-axis. However, this technique is problematic if there are three or more dimensions. One solution is to represent the solution in a three-dimension spheroid (Nenadić and Greenacre, 2007). However, 3d graphs do not reproduce well on paper, and they are often difficult to interpret. The second, factor analytical, approach is not used as often, but this approach is less interested in clumps of related items than extracting a series of key factors that explain the table. Thus one looks for the arrangement of points along the axis, rather than the clumping of points in a particular space. Here I am looking more towards the second approach. That is, are there salient factors that can describe the various media and networking styles.

This second approach does not require one to plot the points on an xy plane. In fact, it presumes that the solution to a correspondence analysis may be in one dimension or three. It is also akin to the original meaning of correspondence analysis. As van Meter et al. note, correspondence analysis was a result of a French drive to replace categorical *a priori* assumptions with empirically-grounded interpretations of social forces (van Meter, Schiltz, Cibois, and Mounier, 1994). They recall an early philosophical progenitor of correspondence analysis, Benzécri. For him "what is important is not the data whose analysis gives an appropriate image, but the factors which represent an image of reality." (1994, 129). Benzécri is also known to be fond of suggesting that the model should fit the data, not the other way around.

Thus Le-Roux and Rouanet propose that returns to the original philosophical context of correspondence analysis (2004). In this newer approach, each dimension is represented along its own axis, and one may examine as many axes as there are dimensions. This work has since been used by Hsung, Lin, and Breiger to assess different

dimensions of the relationship between social position and social capital (2008).[9]

This particular correspondence analysis has yielded one clearly significant dimension, which explains 52 percent of the variance and one dimension that is not as significant but explains 26 percent of the variance. The media and social activity clusters are plotted on these two dimensions in Figure 5.6.

Part of the advantage of looking at a single axis rather than a plane is that I can effectively examine the contributions of each individual row or column to that arrangement. Here, the size of the points are proportional to the weight of each of the rows or columns. As an example, consider the first dimension, titled "planning". Here the daily hangout and daily drop-in partitions contribute the most to this arrangement, while the daily neighbouring and weekly neighbouring partitions contribute very little to the overall arrangement. Thus, I now have two clues about how to interpret this dimension—the overall arrangement of the points, and the relative contribution of each individual point to the overall arrangement.

The first dimension clearly reinforces the assertion that social activity styles are tightly coupled with a propensity to plan. All the points are ordered from the lowest planning groups to the highest planning groups. Additionally, one can see among the media cluster that there are three distinct areas. The light planning group is very close to the moderate telephone and in person group. In the middle are the two "single medium" groups—those who are heavy in person planners and those who are heavy telephone planners. Over on the right is the all media group. The heavy cell phone and in person group appears caught between one of the single medium groups and the all media group (as would be expected).

Similarly, one may notice three areas for social activities. On the left hand side, the light activity group is close to the two neighbouring groups and the weekly meeting

[9]I would like to thank Ronald Breiger for the use of his correspondence analysis measurement and visualization routines. All correspondence analysis was done in R using these routines and cross checked using Stata's `ca` function.

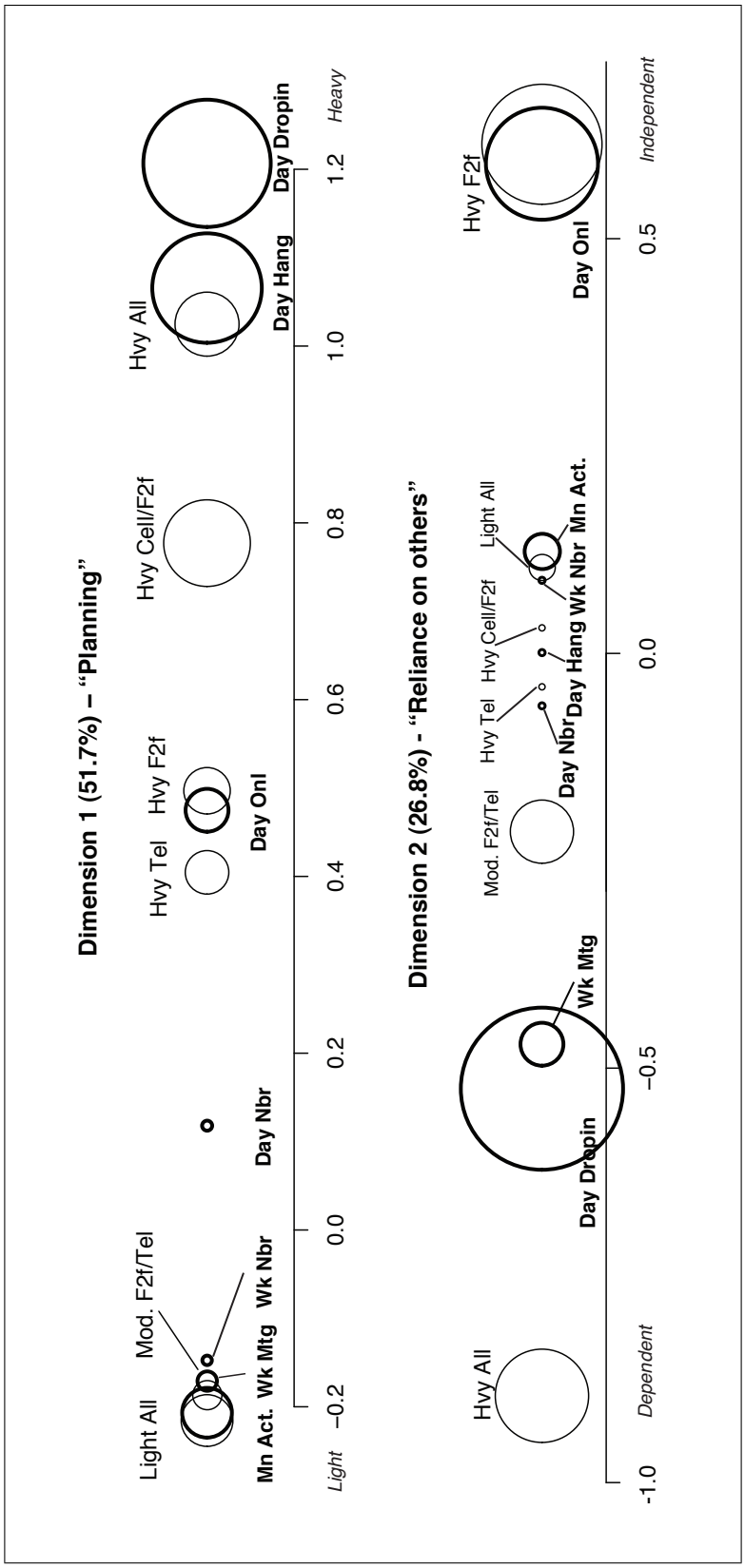

Figure 5.6: Single axes plots of media use coupling and social activity coupling.

group. Interestingly, neither neighbouring nor weekly meetings entail much planning on the part of the respondent, so it comes as no surprise that these groups are clumped together. In the middle is the daily online group. Indeed, daily neighbouring is in between these two, but its contribution to the overall arrangement is miniscule (implying it is not worth theorizing about its role). Over to the right is the most prominent clump in this solution—the daily hangout group and the daily drop-in group. These two make a particularly large contribution to the overall arrangement: 70 percent.

The second dimension is neither as distinct as the first nor does it explain as much variation as the first. Yet, since it explains 26.8 percent, it is worth speculating, bearing in mind that it is still only half as prominent as the first dimension.[10]

This dimension places two seemingly unrelated social activities (drop-in and weekly meeting) on one pole and chatting online on the other. However, if one considers not merely the respondent's propensity to plan, but the extent to which an event is planned period, it comes in clearer view. Regular meetings are structured events that need little planning on the part of the respondent, but are nonetheless planned. Dropping in appears to be particularly planned by respondent. These events require some meeting up in person and are arranged, whether or not it was the respondent who performed most of this arrangement. By contrast, online chatting is based primarily on access. As Quan-Hasse and Collins (2008) note, individuals use IM to regulate their social access—IM (and online chatting broadly) fits into the rest of their scheduling demands. They note that students are particularly prone to using instant messenger applications, as they often have short periods of downtime between classes where they simply check instant messenger to see who is available. Unlike dropping in, which implies coordination with a given alter, and calling just ahead of time, online

[10]Correspondence analysis is a hierarchical technique. The maximum number of dimensions is equal to the smallest number of either rows or columns minus one (which in this case is $6 - 1 = 5$). The first dimension explains 51.7 percent of the variation, and the second explains an additional 26.8 percent. The remaining 21.5 percent is split between the remaining three dimensions, 13.1, 7.6, and 0.8 percent, respectively).

chatting is done with who ever is available, whenever they are available.

The paragraph above illustrates why I have termed this axis: reliance on others. Drop-in and weekly meetings involve specific commitments from other individuals. By contrast, online chatting is not so much about specific commitments to specific coordinates as it is about mere regulation of access. This, I have termed the poles of this axis "dependent" and "independent". But do these poles also faithfully describe the media use partitions? To some extent, yes. Heavy planning via media requires the engagement of many individuals. Indeed, this is the group to do the most planning and have the most alters. By contrast, the heavy face-to-face group appears to make plans based on the contingency of meeting in person—namely whenever someone is accessible. Finally, the clump in the middle seems to follow this general trend, even though the contributions of the various scores are so low that it is difficult to talk about their role definitively.

It appears that there is a relatively tight coupling between media and social activity. This coupling operates on at least two levels. The first is the extent to which a respondent will participate in planning, and the second is whether the activity is about planning at all, or mere accessibility and happenstance.

Of course, these results are not only provisional but also contextual. The Connected Lives survey is a relatively small scale survey of urban adults. They are not teenagers (who, it should be noted are notorious for their wholesale adoption of new technology and extensive disposable time). And to some extent they follow national and cultural standards. For example, texting is an uncommon practice in East York, but a common one in Europe, where the cost of texting is less onerous (Castells et al., 2006). Yet, in spite of these specific media practices and social activities, there still appear to be general dimensions of this media-activity coupling that will probably persist in the face of even newer technologies and shifts in social activities. What will change is not the dimensions, but how prominent each one is, and how many people

fall near the center or on the margins.

It is clear here that networking is not merely about the frequency or intensity of activity, but also about how the activities are staged in the first place. Herein, one may infer clear patterns that are consistent across both media use and social activity profiles. These patterns suggest that the two profiles are mutually reinforcing. Complex person-to-person interactions are sustained by a multitude of media. More traditional place-to-place activities can still use the telephone for intermittent touch-up. Finally, some individuals are not prone to any strategy, but it is not because they are planning parties where no one shows up unsuccessfully. Rather, they do little planning as well as have little social participation. This can partly be explained by social constraints—as the 'domestic' group are disproportionately likely to be new Canadians, poor, and coupled.

In all cases, however, networking and social engagement is a multi-site, multi-media process. Less than two percent of the sample only engaged in one activity or used one medium to plan. For some individual—the media omnivores of the heavy-all group—a multi-place multi-media strategy is a very deliberate attempt to maximize their accessibility and opportunities for social engagement. They are the busiest socially, with the largest networks and fullest social calendars. However, for many others, networking is about optimization, not maximization. For these individuals, the point is to use a sufficient amount of any given media simply as a means to an end. For those that primarily neighbour and drop-in, this means a lot of quick telephone calls or no planning whatsoever.

5.6 Conclusion

This work has highlighted a range of media use and social activity profiles. Some styles involve extensive use of many media for ad hoc planning, while other styles are more tethered to the neighbourhood and social rhythms. By examining the coupling

between media use and social activity styles, I infer two guiding forces—the intensity (or frequency) of networking, and the extent to which networks are structured using fixed routines and rhythms or using ad hoc scheduling. Unsurprisingly, frequent media use is associated with more ad hoc networking since it enables communication across space and time. Yet no style is completely absent of media use—as media affordances are too useful to ignore.

These different styles, while demonstrating clear internal logics, are not easily predicted by social location. Granted, those who are younger and more wealthy are more apt to use media, while those who live in houses more apt to neighbour. Yet, when moving beyond the binary 'use/not use' dichotomy to look at the combinations of media use, it is clear that they are more closely aligned with behaviours and contexts than with ascriptive characteristics.

This situation paints a Janus face of networking. The good news is that styles of networking do not appear to be strongly determined by social location, rather they are afforded by social location. Networking is in many ways an equal opportunity affair. The bad news is that media use and perhaps even social structure are tethered to social activities. Thus one cannot merely 'network harder' or 'smarter' if they wish to change their habits. One has to seek out the sorts of contexts that work well with certain styles. Apartment dwellers who distain email and crave local contact will probably not be successful by reproaching their neighbours for behaving according to the semi-anonymous norms of apartment life. They might be better served by finding an area that facilitates this sort of networking.

While this chapter has discussed the relationship between media and social activity, it has said relatively little about the other participants with whom individuals network. Planning is not simply about specific engagements, but about conceptualizing a set of other individuals, and organizing one's affairs with that set. Yet, individuals are not evenly distributed throughout a personal network. Sisters are tied to brothers

and uncles, voluntary members are associated with each other, and friends can be tied either to each other, or to any number of different roles. This means that the act of planning does not only take into consideration what kind of activity one is planning, but whether it is with a clearly defined group of people, a fragmented set of disparate alters or merely a one-on-one engagement with a close friend or neighbour. Different network structures create different constraints, and differentially place the burden of networking on the individual.

Thinking back to the earlier discussion of social affordances, these differential burdens imply differential needs to perceive and react towards one's network. That is not to say it is completely in one direction and that ego is always simply reactive. But it is to say that different individuals will take advantage of technology in different ways to maintain this accessibility. The need to perceive technology differently is very real, since this perception is tethered to social activities with very particular space-time constraints. And it is manifested through different profiles.

Chapter 6

Within-network variations and networked individualism

6.1 Introduction

THE thesis began with a general question of how to characterize the strategies of multiple media use so that it makes obvious (1) how individuals think about their network, and (2) how they act on that network. The prior chapter examined this through the analysis of personal styles of interaction. These are the sorts of consistent patterns of media use that indicate an overall level of accessibility and willingness to engage in specific social activities. While these styles can give one a glimpse into the ways in which media are used and for what purpose, it is possible to overestimate the stability of these styles. There is variation both within and between these styles. Moreover, simply because an individual has an overall style of media use that is not to say that the individual uses media in consistent ways with all his alters.

This chapter explores the variation within networks rather than between individuals (and hence between personal networks). Since I am peering inside the network rather than taking it as a single entity, it is necessary first to clarify what that network entails.

Most specifically, to what extent are people considered members of distinct groups, and what is the contribution of frequent social contact on one's consideration of net-

work as a set of groups? In particular, I focus on the relevance of social roles as organizing principles for one's conception of the personal network as either a series of groups, a series of dyads or some combination of both.

I demonstrate that the personal network is a cognitive artifact, which is consequently influenced by certain cognitive biases, such as one's ability to recall people based on their ties with others. I am certainly not the first to make this point (Bernard et al., 1979; Marin, 2004), although it is worth reiterating with this particular data set. The fact that individuals think about some roles as very group-like, whereas other roles are very individualistic may have consequences for the way in which media are employed for social contact in everyday life. Indeed, one prominent theory of networking, Wellman's networked individualism (Wellman, 2002) says exactly that: new media are assisting a large-scale shift towards person-to-person networking and away from networking as a group-oriented social affair. After clarifying which roles are considered as group-like and which are more individualistic I turn towards variation in media use with the network. According to Wellman's theory, we should see that sparser and more individualistic networks will be associated with more unique and individually tailored forms of networking. By using a novel measure of the variation of media use in personal networks (termed the "particularity" score), I examine whether group structure, the presence of roles and the use of media explain variation in the particularity score.

6.2 Networked individualism as a theory of networks and networking

A prominent theory articulating how individuals network with each other is Wellman's theory of networked individualism. As suggested in earlier chapters, networked individualism is a large scale theory of social interaction that suggests that the rise of new media technologies alongside social transformations leads to greater

individualism in networking habits. Individuals who employ new media technologies have new perspectives on their ties and thus can manage their interactions in a more specific and by-person manner. This can be contrasted with earlier social interaction (before the digital age) which was oriented towards interaction in shared spaces, and constrained by the shared group norms of these spaces in these interactions. Thus Wellman is often noted to claim a shift "from groups to networks". He suggests that a shift from place and group-oriented interaction towards more individualistic actions should be associated not only with interaction patterns, but also in the very structure of the networks themselves, both in terms of diversity of roles and the sparsity of connections.

Networked individualism draws heavily on the Simmelian concept of overlap in everyday networks. In "The Web of Group Affiliations" (1922), Simmel asserts that, in the modern city, individuals do not exist in conceptual concentric circles of relationships (family, clan, village, county, etc...) but rather exist at the nexus of partially overlapping social circles. He suggests that this was partially due to changes in population density and social differentiation. These shifts led individuals to no longer associate with their nearest alters by default since one may be physically near hundreds or thousands of people relative to the country. Thus, new ordering principles based on individual interest and life courses appeared. These were the freely chosen groups of association, such as the Kinsmen or Lion's club in Canada, that partially intersect with kin, workmates, and neighbours. Individuals, claims Simmel, had freedom insofar as they could associate with any number of these groups. This concept of 'freeing' individuals was subsequently reinforced by Rose Coser, who suggests that such overlaps and potential role conflicts enable the individual to create a singular autonomous identity that transcended or operated through these myriad associations (Coser, 1975).

Networked individualism takes this concept of individual autonomy through par-

tially overlapping groups a step further by drawing on the social impact of new media and increased potential for global transportation. To illustrate this theory, Wellman offers a tripartite schema of door-to-door, place-to-place and person-to-person networking. Door-to-door networking corresponds to the pastoral community networks that Simmel referred to in the country. Individuals would walk (or ride) over to their neighbour's house, or down the road to specific locales. Wellman considers this form of networking as done within 'little boxes' or tightly bounded sets of relationships.

Simmel's more modern form of networking between partially overlapping social circles relates to Wellman's second ideal type—place-to-place networking. Here, one does not merely network at the clearly demarcated households of other individuals, but also neutral spaces such as a meeting hall, "third spaces" and across the city (Oldenburg, 1989). More radically, however, this networking can also take place without physically traveling anywhere, since media like the telephone and the postal mail allow individuals to communicate over distances between specific places. It is considered place-to-place since traditional media are tied to specific locations. Mail is sent to an address whereas the telephone would be tied to a fixed line associated with a place such as a home or office. One does not have to travel to a specific place in order to communicate, but place is still relevant for communication. Rather than little boxes, this form of networking is considered glocal, as it is a hybrid of local and global spaces.

The third form of networking put forth by Wellman is person-to-person networking. This draws on the affordances of new media which can facilitate individual interactions regardless of a specific place or time. Email can be checked from any computer or mobile device, rather than a unitary and static mailbox. Cell phones also are no longer tied to a specific place but move with the individual. When calling a cell phone one expects a specific person on the other end rather than one person from a set of several. Wellman suggests that person-to-person networking is very individual-

istic, as people can fine tune their strategies to specific individuals as well as navigate their social interactions without reference to specific group norms. It is not wholly individualistic, however, as it is still oriented towards social activity. Thus, Wellman considers it *networked* individualistic since people are connecting in specific ways to specific network members. Wellman refers to this style simply as networked individualistic (as opposed to little boxes or glocalization). It is also characterized, according to Wellman, by an extensive, diverse, and sparse network, the like of which could not be maintained by group norms, but can be done through individualized connections to others.

In Wellman's theory, there are two distinct tripartite schemas at play, which seem at face value to reinforce each other. The first is the style of networking. This is how individuals contact each other, and what affordances they take advantage of. The second is the structure of connections between individuals, such as how dense or fragmented they are. Wellman suggests that the two are related. Yet, even if they are related, they are conceptually distinct. As noted in the earlier chapter, individuals with wildly different networking patterns do not have correspondingly different network structures except in the extreme case of hyper-communicators who unsurprisingly have significantly larger networks than individuals in the other groups. By decomposing Wellman's theory into these two specific domains (variations in network structure / variations in contact patterns), I am able to look at both in turn, and then assess what connections exist between the two. The first half of this chapter examines variations in network structure while the second half examines variations in contact patterns.

6.3 Part I: Variations by role

Individuals network within structures, but these structures vary both in how intelligible they are to ego, as well as how much a part ego plays in sustaining these structures. To emphasize this point, consider that many alters are part of a kin structure, where

roles and often obligations are clearly set out among individuals. By contrast, neighbours do not have such a clearly defined relational structure, but are structured in terms of space—with some individuals being accessible from the backyard or the balcony and others living 'down the street'. And again, ego can no more tell one's uncle to become a cousin than they can tell their neighbour to move to a nearer house.

Variations in roles are revealing, as they indicate how individuals from different areas of the network operate in different ways. Most specifically, I am interested in how intensively individuals contact others by role as well as the linkages both between roles and within them. This latter point is often considered under the concept of bridging ties and bonding ties.

Variations in contact reveal whether alters are recollected in part because they are frequently in contact (thus being considered "top of mind"), or whether they will still be recollected, and considered sufficiently close even if they are not frequently in contact.[1] Relating contact and recollection in this way leads to the question: if individuals are not top of mind (i.e., they are the least frequently contacted) then why are they recalled in the network in the first place? This is why I also examine bridging and bonding ties. Roles that are contacted less frequently also are very dense as well as very insular. For example, only half of voluntary organization members are contacted monthly or more. Then why are these people recalled in the network? I suggest it is because the structure of the organization facilitates easy recall of these individuals (i.e., by recalling one, individuals may thereafter recall several others). The same can be said of extended family.

[1]Strategies for maintaining "top of mind" status is a common part of networking in business rather than everyday life. It is common for sales people and others in CRM (customer relations management) to have a 'tickler file'. This file is a list of clients that are to be contacted every few months whether or not there is new business thereby making the salesperson top of mind in case a new issue comes up (Young and Jones, 1979).

6.3.1 What roles most evidently show a group-like structure across networks?

Hypothesis 1 (On perception): *Roles that have a culturally imposed structure will show more group like structure than roles that do not have such a structure.* Thus, I expect to see kin and voluntary groups having a tightly bounded structure, while online friends, neighbours, workmates, and other friends will exhibit a more loose and fragmentary structure.

Hypothesis 2 (On contact): *Alters from roles that do not show a group-like structure are contacted more frequently, as ego is especially responsible for sustaining contact with these alters.* And conversely, alters from roles that show an especially group-like structure are connected less frequently.

6.3.2 Part Ia: Variations in perception of network structure

This section will demonstrate how one can use social accessibility to understand differences in contact by role. Where certain roles have a group-like structure, one does not need to access every individual in that role as frequently in order to sustain the tie. News can be passed on transitively through mutual ties, events can be planned that include both ego and alter and even if ego or alter is not always directly accessible through contact, they can be indirectly accessible through mutual ties in the network. By contrast, for alters that are isolated or fragmented, individuals have to sustain contact with every single tie, as there are few opportunities to have others sustain the mutual interactions.

Before proceeding, the reader may wonder about the definition of group-like? Is it a psychological category, a structural one or a behavioural one? I contend that it is all three. That being said, the purpose of this section is to link these three in some coherent fashion. Structurally, groups are similar to "communities" in the information science literature. That is, *they are subsets of a network that contains more links between*

the nodes in this subset than between these nodes and the rest of the graph (Newman, 2006; Leskovec, Lang, Dasgupta, and Mahoney, 2008). This measure is complicated in the personal networks literature because these links are about closeness, rather than discretely measured metrics like "links between webpages" or "emails within a corporation". In personal networks, individuals often think in terms of groups rather than specific dyadic links. That is, they may superimpose a group-like structure (as defined above) over a set of nodes. Why will individuals do this? I suggest that it is when roles provide easily understood social structures. For example, a family is an easily understood structure. Within a kin structure, individuals can occupy a specific role such as mother, father, uncle, cousin, etc... One may not act in concert with all of one's family ties (or act in such a way that would make this structure obvious), but one may still think of the family as a coherent group. As a consequence, individuals will describe members of this group in terms that match the structural definition. To give examples of how the psychological, structural and behavioral concepts of a group interweave in practice, I offer three example networks from the Connected Lives interviews. They will be followed by a quantitative analysis of all the networks as a single data set.

The three networks in Figure 6.1 were selected based on their illustrative value, although that should not be taken to mean they deviate substantially from the overall sample. Rather, these networks are used to show some of the features which are found in many of the other networks. Moreover, they show features that are reinforced by my subsequent quantitative analysis of the entire set of networks. The labels show the role of the individual as an abbreviation of the eight roles discussed herein. The tint of the nodes reflects the closeness of the node to ego—a darker node is closer, whereas a lighter node is less close. The edges refer to the closeness between individuals (as perceived by ego). The darker edges refer to very close connections and the lighter ones refer to somewhat close connections.

The first network demonstrates a highly group-oriented lifestyle. The respondent,

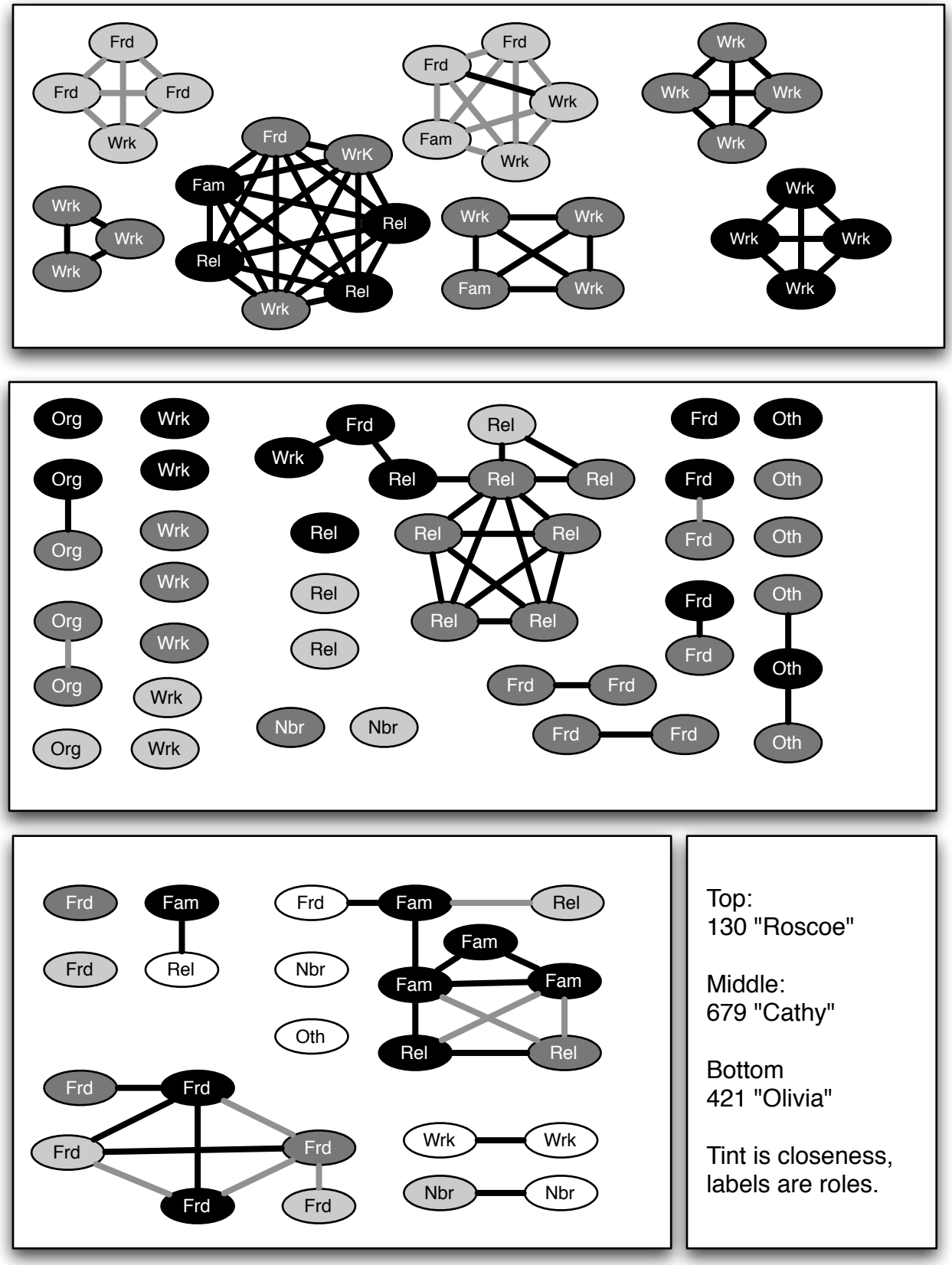

Figure 6.1: Three networks selected to show differences in structure by role.

"Roscoe" (#130), is a former lawyer now retired. He works for numerous charity organizations as well as a few clients in the health sector. His network was clearly demarcated by the spheres of life. Not coincidentally, he is not a fan of the Internet, and prefers that people either call him or speak to him in person. Interestingly, this is partially borne out of his social position and ability to access individuals without recourse to the Internet. As he notes:

> Well I won't go online, I'll actually go to the expert in that particular area. I mean if I need Dr. [name omitted] at the University of Minnesota, I will call him specifically. We'll sit down and say "Here, what interpretation do you need of this medical information?" Legal questions the same way, I will call the lawyer or I will call the crown, and then I will call other people who are familiar with the case from a legal point of view. And it's all phone, everything is done by phone, or lunch it depends on how complicated and how determined they are to fight, I mean sometimes there is no conflict.

. Each group is not merely a structured set of individuals, but also a context. When I think of Wellman's place-to-place networking as a group-oriented affair, this is the sort of individual that comes to mind. He will do lunch with some individuals, but permit access to any individual in that group on a specific topic (such as a specific set of doctors, clients or peers).

The second individual, "Cathy" (#679) is on the other extreme. Her network is filled with disparate friends from different walks of life, alongside a loosely connected group of kin. Some of these alters are in Toronto, while others are found across Canada. But interestingly, she is neither an Internet user nor does she have a cell phone. For her, social activities are centered around specific spatio-temporal events. Consider how she describes her day:

> I love a very busy life, I don't know what you'd call a typical day. Tomorrow, for instance, I have a lecture at U of T [the University of Toronto],

> which I may not attend because in the evening a Sorority I belong to is having a party and we're the hostesses, so I will be busy. Thursday, I'm going to see *Wicked* [A stage play] and then to a meeting in the evening. Friday I'm going to the Toronto consort. Saturday I'm going to see *The Beaver show*...

Despite the fact that Cathy focuses on scheduled events and does not use new media, she is still able to manage a wide and fragmented network through, as she terms it, "keeping busy". As one can see from her description, these are all planned events, many of which are ticketed (*Wicked*, the Consort and *The Beaver Show*). They are the sort of events that one attends with one or a handful of other individuals. Later in the interview she notes how she generally seeks out specific events to match with specific individuals. Also, one can see that she is thinking very carefully about specific individuals from a diversity of contexts (a handful from organizations or from work) rather than vaguely considering all of her relatives or all of her friends as close to each other.

The third individual, "Olivia" (#421) is in between these two extremes of either cohesive groups or primarily isolates. Olivia works part-time as a public relations director (writing press releases and organizing campaigns). She is 33 years old and married with two young children. She has a few large components in her network, one of which is a set of familial ties and a family-friend, the other is a component of her friends, generally from past work. In addition to these components are a series of isolates or dyads that are role-specific. These include two isolated friends, a few neighbours, the other side of her family and a set of work ties. She does not have any online-only ties or ties to people from organizations. Unlike Cathy and Roscoe, Olivia uses the Internet for communication. One can see the benefits of the affordances of the Internet for Olivia's ability to maintain ties, most specifically, the fact that the Internet is asynchronous. Her life is constantly interrupted, and being able to fit communica-

tion in between domestic chores is seen as a boon.

> So, I would quickly check my email—quickly check my inbox if I knew I'd have to fire something off to someone...so, it's really for very brief periods of time that I'm on the computer with the kids around because it's just not conducive to getting any serious work done. So, you know, they'll come—he'll come and try and hit the keys. He'll elbow himself into that little space and you know try and get in there and so, you know...it's a very, very brief period of time that I even bother trying.

One thing that stands out from these networks is that family are generally connected as one component or two (when there are in-laws). Second, friends may be connected or fragmented, often depending on the perspective of the individual and the sort of activities they engage in. Neighbours are almost always disconnected while organization members are almost always embedded in larger groups. However, these insights are merely anecdotal at this point. Below, I offer a more broad series of metrics about the networks that should clarify these intuitions quantitatively.

To examine the relationship between role and links quantitatively, I employ a mixing matrix. Each row and column represents a category (such as male and female). Each cell represents the percentage of links that go from the row category to the column category. For example, if one looks at mixing in telephone conversations by gender, then the diagonals of the matrix are the percentage of conversations that are male-male and female-female. The off-diagonals represent the percentage of calls that are from males to females, and from females to males. If it is a directed network, both the top and bottom half of the matrix is filled out. If it is an undirected network, as is the case in this research, only half of the matrix is filled out.

While not common in social network analysis, mixing matrices have been used to assess patterns of diffusion in sexually transmitted infection (STI) research (Gupta, Anderson, and May, 1989). If people infected with STIs have repeated sex with others

who have STIs then the particular infection is considered very infectious. However, if there are many links between STI-positive individuals and STI-negative individuals then the strain is not as infectious. This work was subsequently generalized by Newman (2003) who demonstrated both continuous and categorial mixing in many domains, such as address books, the Internet server structure and neural networks. For example, the Internet backbone is highly assorted with servers of very high degree connecting to local computers of very low degree.

Once a mixing matrix is calculated, past researchers have then reduced this matrix to a single value by calculating the proportion of the ties on the diagonal (ties between alters of like type) to those on the off diagonal (ties between those of different types). This value is called assortativity, or the assortative mixing coefficient(2003). My analysis will pursue a different route. This is because I am not as interested in the per-network level of mixing as I am interested in the per-role level of mixing. Also, assortative mixing values are intended for connected networks, whereas most personal networks contain numerous disconnected components. So instead of calculating a single value for each of the 86 networks, I calculate the average mixing value for each type across all networks (for example, the average number of links between family members across all networks, or the average number of links between neighbours and workmates).

The average mixing scores are presented in Table 6.3.2. It is an undirected network so only one half of the matrix is shown. Each cell in the matrix holds two values. The top value is the weighted average whereas the bottom value is the unweighted average. The weighted average represents the percentage of ties between alters of like type averaged across all networks, whereas the bottom value is the percentage of ties between alters of like type as a total of all ties from all networks (i.e., it is the dyadic mixing regardless of how such links are distributed through the networks). I present both of these values since the difference between them gives some clues as to whether

	Fam.	Rel.	Nbrs	Wrk	Onl	Orgs	Frds	Oth
Fam	26.72							
	18.31							
Rel	8.40	8.07						
	10.86	11.15						
Nbrs	0.97	0.44	4.25					
	1.78	0.92	5.04					
Wrk	0.44	0.32	0.47	6.06				
	0.54	0.69	1.15	5.99				
Onl	0.02	0.00	0.01	0.06	0.02			
	0.03	0.00	0.03	0.11	0.03			
Orgs	0.05	0.15	0.09	0.31	0.14	3.68		
	0.11	0.77	0.23	0.29	0.20	3.18		
Frds	4.87	1.56	2.89	3.15	0.00	0.99	20.66	
	6.05	1.83	2.67	2.46	0.00	0.75	15.91	
Oth	1.29	0.22	0.08	0.01	0.00	0.13	0.74	0.39
	0.63	0.09	0.03	0.03	0.00	0.03	0.63	0.40

Table 6.1: Mixing matrix of links within networks and between dyads by role

The top number is the percentage of links between roles averaged across all networks (the weighted value). The bottom is the percentage averaged across all dyads (the unweighted value).

these linking patterns are the result of especially large or especially small networks.

As a fictitious example consider the following: Four networks have a total of 100 links. Of these, 40 links are between family members, but they are unequally distributed. If one network has 10 ties between family members out of 40 ties (25 percent) while the remaining three networks each have 10 ties between family members out of 20 total ties (50 percent each), the weighted score will be: (.25+.50+.50.+.50)/4 for an average of 44 percent of ties. By contrast the unweighted score will be (10+10+10+10)/100 for an average of 40 percent of all dyads. Thus, smaller networks play a larger role in the weighted score. So in general, where the weighted score is larger than the unweighted, it is because smaller networks are disproportionately responsible for the links. Where the weighted score is smaller, then larger-than-average networks are disproportionately responsible.

To give a concrete example from the data, notice that the first cell describes the links between immediate family members. The weighted average is 26.7, meaning that on average 26.7 percent of links in the networks are between immediate family members. The unweighted average is 18.3 meaning that 18.3 percent of dyads are family-family links. The fact that the weighted average is much higher than the unweighted average indicates that smaller networks (or networks with fewer family members) are disproportionately responsible for the density of family-family links. So smaller networks count for disproportionately more in the weighted score.

The raw link percentages in the mixing matrix are interesting in their own right, but it is possible to walk away from the scores with a false sense of the relevance of the different roles. Indeed, most of the links are between family while few of the links are between organization members. However, there are also fewer organization members in the networks than there are family members. For this reason, it is more interesting to examine not merely the average mixing matrix, but the ratio of homophilous ties (of like role) to heterophilous ties (between alters of different roles). This measure

Weighted		Unweighted		Percent isolates	
All Kin	4.18	All Kin	3.00	All Kin	0.06
Orgs	1.99	Orgs	1.34	Fam	0.05
Fam	1.67	Wrk	1.14	Rel	0.09
Frds	1.46	Frds	1.11	Orgs	0.18
Wrk	1.27	Fam	0.92	Wrk	0.21
Nbrs	0.94	Nbrs	0.74	Frd	0.24
Rel	0.73	Rel	0.74	Nbr	0.26
Oth	0.16	Oth	0.28	Oth	0.39
Onl	0.09	Onl	0.08	Onl	0.68

Table 6.2: Ordered list of the ratio of in-links to out-links by role

is more fair as this ratio is based solely on the number of links in to links out. As such, regardless of the size difference between the number of family members and organization members, the ratio of homophilous links to heterophilous links may still be on par.

The ratio of in-links to out-links tells a great deal about how individuals structure their networks by role. If the ratio is very high it means that this sort of role is very insular and does not link the network together overall. For example, a score of two indicates that on average there are two links between people of a given role for every link to people from that role to other roles. If the ratio is very low (i.e., below 1) then it means that this role connects different areas of the networks together. This is because there is less than one link between people of the same role for every link between people of that role who link to others in the network. Thus, the ratio of in-links to out-links can indicate what roles serve as bridging ties and what roles serve as bonding ties. Herein, I suggest that bonding ties (i.e., those that make the connections between a single role more dense) indicate the group-like structure of a role, whereas bridging ties (i.e., those that connect individuals across roles) are networked individualistic. If a role has many in-links, it is a role characterized by bonding between people of that role. If a role has more out-links then it is a role characterized by bridging, where people from that role connect other parts of the network together.

Table 6.2 shows the ratio of in-links to out-links. Here one can see that in general,

immediate family members are most insular and group-like in the network. A value of 1.66 means that on average there are 1.66 links among family members for every link between family members and other roles. While 1.66 is not an especially high value, by combining the ratios for immediate family and extended family, the ratio is a very substantial 4.18, meaning that there are 4.18 links between kin (immediate and extended combined) for every link between kin and other members of the network.

At this point the reader may be inclined to wonder about those individuals with no links to others. Do they also follow the same pattern? As seen in the third data column of 6.2, they do in fact follow this general pattern and reinforce the general claim about the group-like or individualistic qualities of different roles. This column shows the percent of nodes in the network who are isolates, sorted by role. To be clear, this is the percent of a specific role who are isolates, not the percent of isolates who are a specific role. Kin are the least likely to be isolated individuals in the network, followed by organization members. Again, friends and workmates are in the middle while neighbours, 'others', and online friends are the most likely to be isolates.

There are (at least) two ways in which one can interpret these ratios in light of the theory of networked individualism. The first is conceptual and the second is methodological. Conceptually speaking, those roles that have a very low in/out ratio are going to be most likely associated with networked individualistic networking practices. These are the sparsely connected ties that bridge networks, rather than the densely connected ties that are representative of a 'group' structure. Returning to Table 6.2, one can see the rank order of the roles on their in/out ratios. Kin are the most likely ties to represent a group, whereas online friends are the least likely roles to represent a group (in the personal network). Also particularly interesting is the fact alters from organizations are twice as likely to link inwards as to link outwards. Thus alters from organizations can be interpreted as having a group-like structure. But counter-intuitively, it also means that alters from organizations can serve the bridging function

that has been asserted in the literature by numerous social capital scholars (Putnam, 2000; Erickson, 2001; Lai, Lin, and Leung, 1998). How can both conclusions be the case? This is a group of individuals who are linked together and thus share a common organizational order, but members of this order are drawn from separate personal networks and do not otherwise link in to these personal networks very much. Therefore, an organizational group can serve as a nexus of several personal networks. The group itself acts as a bridge between personal networks, even if the group itself is densely connected (Feld, 1982).

Interestingly, it follows from this logic that neighbours represent networked individualistic relations, although to a much lesser extent than online individuals for they are slightly more likely to link to other network members than they are to link to other neighbours. In fact, they are less insular than any other group, other than online and 'other', both of which are difficult to categorize since they represent such a small fraction of ties overall. Online ties represent a mere 0.5 percent of all links, while 'other' represents a measly 2 percent of all links. Nevertheless, this finding about the linking patterns of neighbours is in conformity with Wellman's concept that we have shifted from door-to-door neighbourhoods to person-to-person networks. It is not the case that individuals know a tightly knit group of spatially proximate individuals, but selectively choose a handful of neighbours who are linked, if at all, to non-neighbours. The neighbourhood in this sense does not operate like a group, but more à la carte. Moreover, if I could control for the number of neighbours that are merely linked to their spouses, I am certain this number of in-links to out-links would be even lower. Unfortunately, the data set cannot reliably facilitate such a control.

6.3.3 Part Ib: Variations in contact by role.

In addition to examining the links between network members, one can use data on contact with alters to round out our understanding of how networking varies by role.

Weighted		Unweighted	
Fam	0.68	Onl	0.64
Onl	0.67	Fam	0.58
Wrk	0.63	Wrk	0.51
Oth	0.57	Frd	0.43
Frd	0.54	Oth	0.43
Nbr	0.51	Nbr	0.38
Org	0.49	Org	0.35
Rel	0.36	Rel	0.29

Table 6.3: Ordered list of the percent of alters contacted monthly by role

This second part of the role analysis should be treated with care, however. Whereas the analysis of linking by role was done using every alter that was elicited in the interview, communication frequency with network members was only done with a subset of these individuals. Recalling Chapter 4, the interviewer administered 'minisurveys' for many network members. Specific members were chosen using a purposive scheme that was designed to maximize the spread among network members. Prior analysis of the distribution of those sampled compared to the remaining network members demonstrated that these individuals did not vary significantly on either tie strength, gender or role, with one small exception. Extended family were less likely to be sampled relative to their presence in the network (Hogan et al., 2007). This is because only one alter per household could be selected for the minisurvey. Since many extended family members were named alongside their spouse, this accounts for the discrepancy.

The minisurvey asked about five points of contact: in person contact, contact while socializing, telephone contact, email contact and instant message contact. Undoubtedly, this is not a complete list of points of contact. Individuals also send greeting cards and in recent years, use social software for contact. However, this analysis precedes social software and greeting cards are not relevant, since I am interested in active (read: monthly) contact. Greeting cards are usually sent at special occasions rather than on a regular basis.

Table 6.3 summarizes the percent of alters contacted monthly or more via any

medium/social context. The table is organized very similarly to Table 6.2. In both, the roles are ordered by their value and two columns are presented, weighted, and unweighted. Accordingly, the weighted values represent the average percent of alters contacted monthly per role, averaged across networks, whereas the unweighted values represent the average percent of alters contacted monthly per role regardless of their distribution in different networks.

Unsurprisingly, immediate family are the most likely group to be contacted via any medium. In addition to being the most dense, they also share a special place with most individuals as their first and most stable ties. What is more novel is that the second most often contacted group are online only alters. This reinforces hypothesis 2, as online alters are generally isolated from each other, and link, if anywhere, to other non-online network members. By virtue of being online and sparsely connected, it appears that their inclusion in the network is very sensitive to the amount of contact ego has with these alters.

A majority of alters from work are also contacted at least monthly, as are a slight majority of friends. Also, when examining the percent of friends contacted at least monthly, one can see that the weighted average is much higher than the unweighted average. Recall that this situation indicates that smaller networks play a greater role when the weighted average is higher than the unweighted. This means that as people increase the number of friends they recall for inclusion in the network, they will recall individuals who they see less frequently. This helps to further the idea that what one sees as 'the network' varies not only objectively, but also according to ego's subjective threshold for who belongs in the network.

The idea that different roles have different thresholds for inclusion certainly reinforces the other groups on the lower end of the contact scale. Only one third of relatives and organizational member dyads are contacted monthly. This number is smaller than the weighted number, again reinforcing the idea that larger networks in-

clude more of these individuals who they would not contact as regularly. So why are these individuals included in the first place? As mentioned above, both relatives and organizational members are a part of a clearly intelligible structure, thus if one recalls one member, one might recall another. Individuals also think about their wider kin network as a structure of aunts, uncles, cousins, in-laws, and so forth. Thus, these individuals are included in the network not because their relationships are as actively maintained, but because they are part of group-like structures which themselves are actively maintained.

Given this pattern, neighbours might appear to be a fly in the ointment, so to speak. They are not densely knit like organization members and relatives, nor are they frequently contacted like online friends and workmates. Yet, they are also a part of a perceptible structure—the structure of households on the street. Individuals can recall specific neighbours just by thinking about who lives near them and are close enough to be included in the network. By virtue of living near, they need not be as actively maintained (since they will be accessible regardless). That said, it is certainly possible to increase how many neighbours are 'top of mind' as Hampton and Wellman (2003) have noted in their Netville study. Therein, under relatively artificial conditions, those individuals who had the additional group focus of "high-speed Internet" were more likely to socialize and know their neighbours. However, given that subsequent studies of wired neighbourhoods have not seen such a similar phenomenon (Hampton, 2007), it is hard to tell whether there was a true effect of the Internet, or merely a Hawthorne effect of these individual being pro-social because they had a new and novel shared activity.

6.3.4 Summarizing the results from Part I

The first research question was focused on the group-like structure of roles. I examined both the connectivity of individuals by role along with the proportion of individ-

uals contacted by role. Both of these analyses were at the network level. As such, I cannot make a direct strong claim about the relationship between role structure and contact frequency. However, the two hypotheses given earlier in the chapter appear to be validated. Roles that are perceived as group-like due to pre-existing structures are indeed more inward linking than roles that do not possess such an obvious structure. Also, roles that show a group-like structure are more likely to be recalled even though there is less contact per individual—individuals show up in the network by virtue of their membership rather than ego's activity with alter. The only exception to this is immediate family members (rather than all kin). They are both densely knit and frequently contacted.

There are significant consequences of these findings for a study of networked individualism. This study, like many that have come before, uses interpersonal closeness as a measure of inclusion in the network. This measure is partly a cognitive construct since it refers to how close individuals *feel* towards each other. Yet, people can feel (at least somewhat) close to a group of individuals, as evinced by numerous large cliques in the network. Of course individuals will feel closer to some group members than to others, but they are all still 'close enough' to warrant inclusion in the personal network.

Wellman talks about how individuals function in networks. Functioning in networks is not necessarily the same as thinking in networks. Functioning is also sensitive to the perceptual cues available from contexts for interaction. Some cues, like those on instant messenger and via mobile phone, are oriented towards individual interaction. By contrast, other cues, like a mailing list, or the membership list for a voluntary organization are oriented towards groups. Below I examine how individuals customize their interaction with specific network members, and whether the presence of certain groups leads to a notable difference in how individuals use media.

6.4 Part II: Variation by interaction pattern

Taken solely as structures of relationships, social networks are clearly ordered, and roles help to define this order. By positing networked individualism as a theory of network composition, we can classify some roles as being more networked individualistic by virtue of their linking patterns (e.g., spanning the network rather than linking inwards towards homophilous roles). However, this is merely a secondary task (here, at least) to an appreciation of the networks as points of access for media use. Networked individualism is a theory of media use with networks as much, or more than a theory of network composition.

One premise of this theory is that networked individuals will make use of new media technology to facilitate more person-to-person interaction and less place-to-place interaction. Media use will not superimpose itself cleanly over groups, but rather cut across specific boundaries, as individuals fine-tune their networking patterns with others (Wellman and Frank, 2001). This theory works well within an analysis of the social accessibility with alters. Namely, it suggests that access (both one's ability to access alters and one's actual behaviour) has changed as a result of the introduction of new media—or more precisely, that new media affordances facilitate new ways of interacting with alters *enabling* new patterns that are person/dyad specific rather than globally applied (Wellman et al., 2003). For example, consider the description of "portability" as an affordance for networked individualism:

> The person is the node to which communication is directed. Person-to-person communication is supplanting door-to-door and place-to-place communication...Personalization recognizes anywhere who people are. With portability, people take their devices with them. The combination facilitates the emphasis on individuals connecting and (mobilizing) to individuals, rather than individuals connecting to groups or groups connecting to

groups.

First, it is worth specifying whether or not personalization would be considered an affordance under my framework. The answer is somewhat clouded. Indeed, personalization fits the criteria of being a perceptual cue that is used when acting on one's network. But personalization of "what"? As an informational affordance, it refers to the specific representation and organization of content based on the user's actions, either explicitly (whereby users select what sort of content they want to see, such as showing movie listings on one's "start" page) or implicitly (whereby algorithms select content based on a user's behaviour—a common practice for targeted ads and online shopping recommender systems). As a relational affordance it is more obviously social. This is the fact that specific technologies provide individually tailored conduits to a specific person. This is the distinction between a person's cellular phone and a home telephone, or a person's inbox and a house's mailbox.

Following through on Wellman's idea of personalization as an affordance is the idea that individuals will have personalized repertoires between each other. Networked individualism is not simply a theory of mass media, where a medium would filter content based on the individual, but a theory of interpersonal communication where devices are tuned to the individual and her communication patterns. At the interpersonal level, this is precisely his point on how media connect people to each other when thinking about individuals versus groups. It is a point made again in his work with Kennedy on the house as a network (Kennedy and Wellman, 2007). Again, the authors focus on the use of personal new media and portable gadgets within the household, in contrast to focusing on the household as itself a point of contact.

6.4.1 How does the variation in contact with network members relate to structure?

So, to reiterate the general research question: what is the role of multiple media in linking the way people think about their network and how they act upon it? From Wellman's point of view, we should find:

Hypothesis 1 (On media use): *That mere use of the Internet does not lead to more specific person-to-person media use behaviours.*

Hypothesis 1a: But since the Internet affords personalization, *heavy Internet users will have more specific person-to-person media use behaviours*.

Hypothesis 2 (On group composition): *Individuals with more alters from heterogeneous roles* (e.g., roles that link to different roles) *will be associated with more specific media use behaviours*, and conversely individuals with alters from more homogeneous roles (e.g., alters who link to individuals of the same role) will be associated with more general and less per-alter media use behaviours.

Hypothesis 3 (On network structure): *Individuals with a more fragmented network* (either through lower density, greater numbers of components or more isolates) *will exhibit more specific media use behaviours*. And again, conversely, more coherent networks will exhibit more general media use behaviours.

However, to these general aspects of networked individualism I can add few other expectations based on insights from the previous chapter. The first relates to the planning variable used in the previous chapter. It is known that the partitions that use more media also plan more frequently. It was implied that these individuals use this media in order to attain additional "coverage" of their network—however, such coverage is not really necessary if everyone in a person's network uses primarily the same media. So I should find that:

Hypothesis 4 (On planning): *Increased planning will be associated with more specific person-to-person media use behaviours.*

Finally, East York is not necessarily a model for the world, but a specific urban context, with its own noteworthy features. One of these is the presence of many newly arrived immigrants. In the previous chapter I demonstrated that some immigrants do indeed network differently. Namely, they have one foot in both worlds. Through the use of online chatting they are able to sustain relationships with people abroad while networking in different ways with those they know in person. So I should find that:

Hypothesis 5 (On personal characteristics): *Recent immigrants will show significantly more distinctive networking strategies with their network by virtue of their need to sustain both local and long distance ties.*

This sets up a relatively straightforward model using a series of distinct aspects of one's social network and social context to predict increased person-to-person networking. But how can I condense the many forms of networking into a single variable amenable to a single model?

Here I introduce a novel concept—the **particularity** of media use. This concept refers to the idea that some individuals have very particular and person-specific media use behaviours, both in terms of frequency and the number of media used, while individuals have very general strategies. A general strategy implies that one networks the same way with all of their alters, while a particular strategy implies that one networks in unique and specific ways depending on the tie.

Barbara and Priscilla, two individuals from the interviews, offer an interesting descriptive counterpoint on the process of particularity in action. Moreover, both networks are almost topologically isomorphic (i.e., they look almost the same when drawn as a network, see Figure 6.2). Finally, these networks were chosen because they represent polar ends of a particularity score, which is described in the next section.

An example of particularity

Both Priscilla and Barbara are young women with children. Priscilla, aged 26, has two children. She is separated from her husband who is in the military and currently overseas. Barbara is somewhat older at 36 years of age. She lives with her partner and they have three children together. Both networks have 14 alters, a triad and the rest are isolates plus a few dyads. Both might be considered networked individualistic structurally. Their networks are sparse, far-flung geographically and loosely connected. Yet, these two cases are on the opposite extremes of media particularity. Priscilla had the highest particularity score and uses a seemingly different strategy with almost all of her alters. Moreover, her score is amplified by the fact that she does not use different strategies occasionally, but on a routine, almost daily basis. Barbara had the second lowest particularity score. She uses a single medium (primarily telephone) with almost every network member, plus in-person interaction with a few friends. A key difference here is that Priscilla uses a combination of media with any given person, whereas Barbara seems to prefer the 'right' way to contact people, and uses only that way.

Further inspection of the interviews reveals that Priscilla's strategy is only partially her doing. While she is very particular, part of this particularity is not because she actively calls people via a variety of media, but because she makes herself accessible by a variety of media. In the interviews we asked if individuals contact alters, or the alters contact the individual. In Priscilla's case, many individuals would contact her, rather than be symmetric or wait for her to contact them. She notes that others simply show up at the house (to visit the kids or help), or the other person initiates email or an instant messenger conversation. It's not that way for all members, but for most. Here one can see how Priscilla is taking advantage of many affordances of media (asynchronicity as well as long distances) by regulating access rather than being overly active with her alters. By contrast, Barbara overwhelmingly claimed that

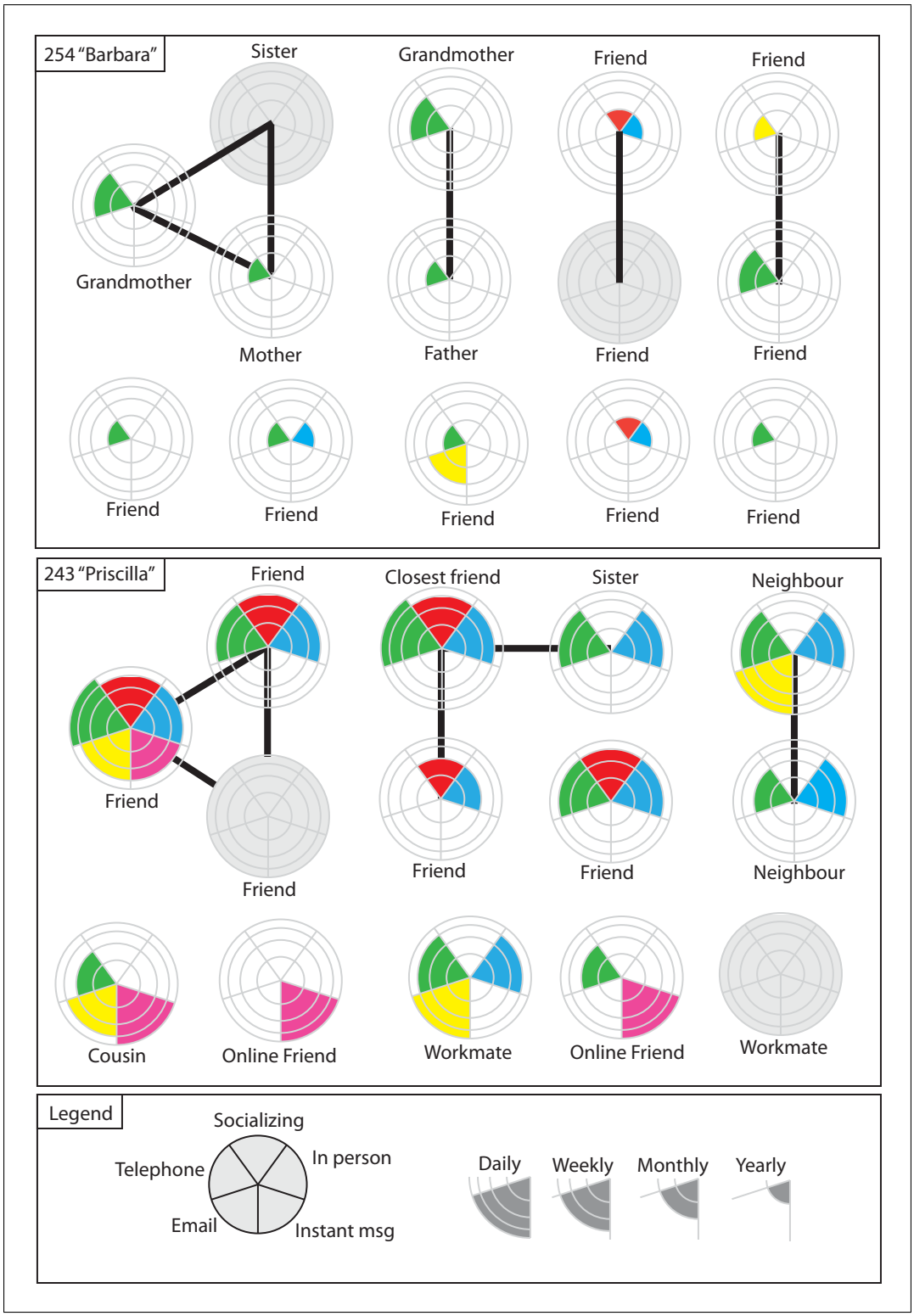

Figure 6.2: Radial pie chart networks showing variations in contact frequency. Grayed out nodes indicate missing data.

all of her alters contact her about as frequently as she contacts them. For her, it is not about regulating access so much as maintaining stability. She prefers the telephone, and prefers to use it with people who keep up (i.e., calling and receiving calls equally). As one can see from these two networks, Priscilla is far more active than Barbara, but that activity is also partly about habit. By routinely checking email, leaving her instant message account active and keeping her telephone with her, she is regulating access so that other people can use what strategy suits them best for contacting Priscilla. By contrast, Barbara says she tried instant messaging once and did not like it. She imbues media with affect rather than affordances. For her it is 'less than' in person or voice contact, rather than being convenient or useful.

6.4.2 The particularity score

Moving from two networks to the entire data set, I need to quantify particularity in some meaningful way. There are numerous means for testing the differences between individuals in a given set, but few of these techniques allow for large scale comparisons across sets. If I was examining one or perhaps a few networks, comparing the networks using multidimensional scaling would be a sensible option. For each network, I could plot the differences in media use between networks. It would be a visual diagram that lays out the members of a network according to their differences in media use. If all members of the network use media similarly with ego then they would all be clumped together. If ego has two clear but distinct strategies (say one with workmates and one with family members), then there would be two clumps. However, 86 multidimensional scaling plots are no way to interpret these personal networks. Fortunately, I can draw upon the logic of multidimensional scaling to get an overall assessment and thus a ranking of individuals by media use.

Fundamentally, multidimensional scaling calculates pairwise comparisons of variables for every case. So if there are 4 cases, it calculates 6 (or (n*(n-1))/2) comparisons.

The comparisons generally use a dissimilarity measure such as Euclidean distance (which is also used to calculate distance in the common network analysis technique of blockmodeling). In the standard form, the formula for this distance is very straightforward as the root of the sum of squares of the differences between variables. For two points P and Q in N-dimensional vector space (i.e., two cases each with values on n variables), the Euclidean distance is calculated as:

$$\sqrt{(p_1 - q_1)^2 + (p_1 - q_1)^2 + ... + (p_n - q_n)^2} \tag{6.1}$$

Thus, if two nodes in a network interact with ego in similar ways then they will have a low distance. By contrast, if nodes show different trends, either because they use the same media in different frequencies or use different media, then their distance will be high in this space. Traditionally, one would use Euclidean distance as a means for partitioning or interpreting a single data set. However, in this case, I need to not only find the distances for a single network, but somehow compare this to all the distances for another network. One option would be to present and visually inspect 84 multidimensional scaling plots. But a more parsimonious option would be to somehow distill these distances into a measure comparable across networks. I term this measure the particularity score.

This particularity score is simply the average of all the pairwise distances in the network. To note, this is not the average of the number of cases, but the number of pairwise comparisons. For n cases, there are $(n(n-1))/2$ comparisons.

If the particularity score is high, then one can infer that there is a great deal of distance between all the cases in the network.[2] But if the score is low one can infer that there is a great deal of homogeneity in the network. The score is obviously dependent on the sort of variables that are put into the formula. If one uses a simple ordinal scale

[2]To be fair, recall media use measurements are not taken for the entire network, but only those network members for whom we administered a minisurvey. Further details about these cases are found in Chapter 4 as well as Hogan et al. (2007).

where 1 = yearly, 2 = monthly, 3 = weekly and 4 = daily, it will produce a somewhat different result than a score that is converted to days where 1 = yearly, 12 = monthly, 50 = weekly and 300 = daily. I opted for the ordinal score since represents a compromise. Simply looking at differences in use/non-use, would be too broad to allow us to distinguish active ties from one-time ties.

The particularity score calculated through this process is a normally-distributed set of values for all valid respondents.[3] The value is not immediately intuitable as a point estimate. But simply stated, it represents the average Euclidean distance between alters on media use with ego. The distribution of this value is presented in Figure 6.3

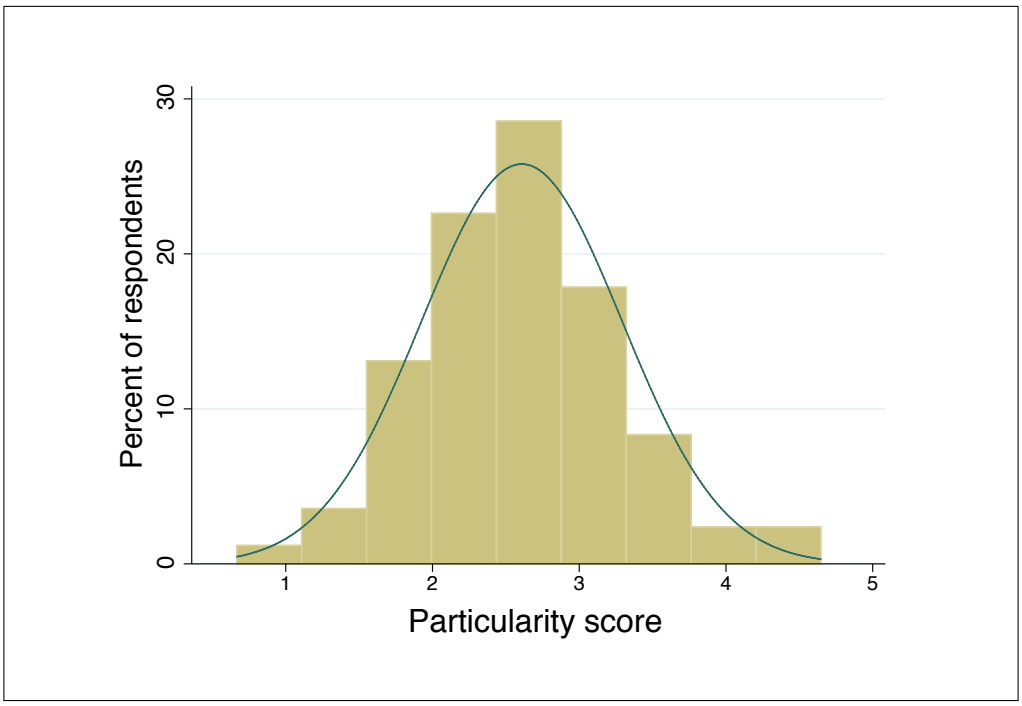

Figure 6.3: Distribution of particularity score for differences of media use in personal networks

I believe that the particularity of media use is a good estimate of networked individualism, as it suggests that individuals have particular media use strategies by alter rather than general strategies for the entire network. Whereas in the last chap-

[3]To be more precise, I can reject the null hypothesis when testing for normality using the Shapiro-Wilk test ($p = 0.614$). To note, in this test one is looking for a non-significant p-value.

ter I clustered the sample on overall media use, in this chapter I consider differences within networks. One key difference, thus, between this chapter and the last is that this chapter uses a more restricted version of the data set, namely those individuals who completed both a survey and an interview ($N = 86$) rather than the complete sample ($N = 350$).

In this work, I am interested in the overall dissimilarity within each network, and how such dissimilarity compares to other networks. Basically, where there is a lot of dissimilarity, it is because there is a lot of variation in media use. Where there is little dissimilarity there is little variation in media use. By definition, the particularity measure captures this dissimilarity.

The dissimilarity value is not at all correlated with the size of the network, although it is correlated with the frequency of contact. Most notably with face-to-face and email contact, suggesting the frequency of these two values demonstrates the greatest differences among the networks.

6.4.3 Predicting particularity

A point estimate of the particularity of media use in these networks accomplishes a number of things. The first is simply a shortcut to assessing the difference in media use among networks. For example, I used the dissimilarity measure when assessing which networks to select for the comparison shown above. Second, it works as a possible covariate for subsequent analysis of networked individualism, i.e., do people who score high on particularity also score high on certain network measures? Third, this value can work as a response variable—namely, what other factors can explain the variation in particularity?

The challenge of this score is whether or not the reader is persuaded that it represents something real, or is merely a statistical fiction. I believe that this measure is reasonable for several reasons. The first is that the formula is normalized across net-

works of varying size, and that the pairwise calculations are intelligible (it is really just the addition of the differences in media use between two alters, for all valid alter pairs). The second reason is that it has a certain face validity. When I examine the networks with the highest and lowest particularity score, patterns of media use become apparent. Thus, it is an illuminating way to order the networks. The third reason is that conceptually this measure scales well with the possible addition of new media or new cases. It is the sort of measure that can be reapplied to subsequent studies of media use to examine intra-sample differences, so long as one collects network data.

Since this is a new measure, there is little literature that can act as guidance about what other variables can help explain particularity. However, there are logical arguments justifying the use of some measures rather than others.

1. *Social location*: Numerous social location measures can be posited to explain particularity. Perhaps men are more general and consistent while women more sensitive to differences among alters. Or perhaps individuals with family members living abroad must be more particular if they want to access the remaining family members.

2. *Media use*: Obviously, since using the Internet is a pre-condition for accessing email and instant messaging (which are themselves a means to increased particularity), Internet use should figure into a model of particularity. Apart from that is the frequency of communication as well as the number of individuals one plans with by any given media. I will use the latter measures with care since frequency of media use, in some form, is how the particularity measure was derived in the first place.

3. *Network structure*: Ultimately, the goal of this measure is to assess whether individuals who have particularistic networking styles also exhibit networked individualistic network structures. Thus, centralization, density, the number of alters, the size of the largest component and the number of isolates should all be candidates for inclusion in a model.

4. *Network composition*: The last section suggested that individuals of different roles

occupy different places in the network. Family are usually collected as one large group whereas friends are distributed throughout the network and voluntary association members are usually set apart. So just as network structure, in the abstract sense of closeness, can foreseeably play a part in particularity, so can either the prevalence of certain roles or the heterogeneity of roles in the network. Here I use the number of alters belonging to each of the eight roles discussed above. (To note, other models using the percent of alters instead showed similar results.)

Since the particularity measure is normal and the cases are considered independently, it is worthwhile to seek to explain the measure through linear regression.[4] This data set includes only 80 viable cases for analysis. This is because of missing data issues with four of the other possible cases. Thus, I am reluctant to perform a simple nested linear regression on these cases (i.e., simply pile on additional variables regardless of their contribution to the model). The inclusion of additional variables cuts into precious degrees of freedom and increases the standard error in the model. This means that even if additional variables increase the raw R^2 value, they can still decrease the adjusted R-squared value and thus interfere with the model as well as render as non-significant variables that would otherwise be significant. Therefore, I employ a nested forward-selection regression rather than a simple nested regression. Just like a nested OLS regression, variables are added into the model in batches. However, only the significant variables are kept in the model from one nesting to the next. I use a *P*-value of ≥ 0.1 as criteria for exclusion.

Table 6.4 presents five models predicting particularity. The first four represent the nested models, and the fifth is simply the fourth model with all non-significant ex-

[4]Independence is an important assumption in regression analysis. By regressing on the alters, independence would be violated since alters are nested in specific networks. In such a case, multilevel modeling would be more appropriate. In fact, this is precisely why it is used in the next chapter. However, in this case I have aggregated the networks into network-level (i.e., respondent-level) data. Thus, I am regressing on 80 interviewees rather than 2044 alters. These interviewees were randomly sampled from the population, meaning that it is unlikely that the same person would show up in two different networks.

	Model 1 Social location		Model 2 Communication		Model 3 Net Structure		Model 4 Net composition		Model 5 Preferred Model	
	Est.	*P*-val.	Est.	*P*-val.	Est.	*P*-val.	Est.	*P*-val.	Est.	*P*-val.
Social location										
Age	-0.009	0.096	-0.003	0.573						
Male	0.009	0.944								
Coupled	-0.298	0.045	-0.205	0.126						
Employed	0.084	0.562								
Income	0.001	0.567								
Immigrant (5 yrs)	0.945	0.000	0.854	0.000	0.771	0.000	0.882	0.000	0.889	0.000
Communication										
Total planning			0.006	0.016	0.008	0.001	0.008	0.002	0.008	0.001
Light Internet			0.198	0.208	0.219	0.154	0.241	0.125	0.245	0.091
Heavy Internet			0.389	0.029	0.402	0.020	0.381	0.028	0.390	0.016
Have cell			0.097	0.473						
Net structure										
Degree					0.026	0.201				
Density					0.256	0.551				
Net size					0.001	0.882				
Isolates					0.053	0.083	-0.005	0.791		
Components					-0.034	0.294				
Centralization					-0.762	0.327				
Net composition										
Immediate fam							-0.021	0.203		
Ext fam							-0.002	0.914		
Neighbours							0.019	0.314		
Wrkmates							0.004	0.809		
Online friends							0.174	0.015	0.159	0.010
Voluntary orgs							-0.019	0.352		
Friends							0.003	0.767		
Other							0.023	0.571		
Constant	2.994	0.000	2.299	0.000	2.031	0.000	2.032	0.000	1.964	0.000
R^2	0.279	< 0.001	0.375	< 0.001	0.403	< 0.001	0.430	< 0.001	0.403	< 0.001
Adjusted R^2	0.222		0.315		0.318		0.320		0.363	
N	83		81		81		81		81	

Table 6.4: Nested OLS regression models predicting particularity

planatory variables removed to highlight the increased strength of association. Through the models one can see a number of noteworthy findings, although the overall picture is consistent with many of the claims made up until now. What is perhaps most striking is the effect of being an immigrant in this sample. This variable is significant throughout all five models and has the highest strength of association with the dependent variable. In Chapter 5 I noted that immigrants were disproportionately located in the "daily online" cluster, and that they were prominent users of online chatting and instant messaging. This is shown again in this model whereby immigrants show a great deal of particularity among their alters. This particularity is most likely due to their interest in maintaining long-distance ties, and their interest in using whatever means possible to that end. Moreover, recent immigrants are probably the quintessential networked individuals as their networks almost by definition are far flung and consequently loosely connected, spanning friends and family from the home country as well as others from their host country (Hiller and Franz, 2004).

Apart from immigrant status, a couple of social location / demographic variables were also significant in the first model, although this significance washed out once I included communication frequency. In the case of age, this is unsurprising as older individuals are less prone to using ICTs, so before ICT use was included, age was a significant variable. Relationship status was not particularly significant to begin with, although given that the coefficient was negative, it suggests that individuals who are coupled tend towards consistency with networks, perhaps by differentiating their use of media between the couple.

The second model included selected measures of ICT status. While cellphones were not employed in the calculation of the particularity index there is reason to believe, based on the results of the prior chapter, that cell phone users would be more particular in their media use, especially since cell phone use is frequently coupled with email use. This was not borne out in the data. However, Internet use was sig-

nificant, and remained significant throughout the remaining models. In this analysis, Internet use was split into three categories: non-user, light user (an hour or less a day) and heavy user (more than an hour a day). These categories were based on Statistics Canada's analysis of Internet users (Veenhof, 2006). Non-users were the reference category, and thus not included in the model. Interestingly, simply using the Internet did not explain variations in particularity. Only heavy Internet use was a significant explanatory variable. This will become increasingly relevant as more individuals move on to the Internet and use it more frequently for different media such as social software and microblogging. It also reinforces the idea that Internet use affords but does not determine fragmentation of media use, as light Internet use was not significant. Finally, the strongest predictor in this model, by far, was the total instances of planning. This measure is based on the survey questions introduced in Chapter 5. There I examined clusters of media use. In this analysis, I simply summed all of the variables into a single planning score. Since planning is highly related to the use of different media, it is unsurprising that it is a significant predictor, however, it does reinforce the validity of the particularity index as the planning variable was taken from survey measurements of planning by media across all alters, whereas the particularity measure was taken from interview measurements for each individual alter.

Perhaps the most interesting aspect of this analysis is the paucity of significant structural variables. Many of these variables are significant in other per-alter models, including the multilevel model in the next chapter and work by other researchers on this data set (Carrasco, Hogan, Wellman, and Miller, Forthcoming). This is to imply that it is not a problem with the measures. Rather, it seems to be the case that network structure is not related to the particularity of media use. To note, one variable was significant in model three (the number of isolates) but the significance of this variable was washed out by the number of online only network members. As we may recall from part I, online-only alters are the most likely role to be isolated, so it is under-

standable that it masks the effect of this variable (or rather, that the only structural effect is really an effect of having online-only alters).

The lack of other clear structural indicators reinforces the network pie charts shown earlier in this chapter. Despite being at two ends of the particularity measure, these individuals have nearly structurally identical networks. Even as a null finding, it is a rather important one for future analyses of networked individualism. It suggests that the individualization of media use and the fragmentation of networks are not especially related. Granted, this is a restricted data set (being from one community in one city at one time). Nevertheless, it is (to my knowledge) the first attempt to link these two conceptual keystones of networked individualism. I will elaborate on the consequences of this model in the summary below.

The last model tested included network composition measures. These measures do not examine the heterogeneity of alters, but the presence of specific alters in the network. Herein, only one role was significantly associated with increased particularity—online-only alters. This should not come as a surprise, since these alters, by default, are only accessed online. To note, the values of these variables refer to the raw number of alters in the network by role. Alternate models using the percentage of alters in the network showed nearly identical coefficients. The interesting null findings in this model indicate that having large numbers of family did not tend individuals towards less particular strategies, nor did having large numbers of friends predict correspondingly particular strategies.

The final preferred model shows a modest adjusted R^2 of 0.36. To note, the raw R^2 value was lower in the preferred model than in model four, even though the adjusted R^2 was higher. This highlights the value of being especially prudent with variable selection in these models.

6.4.4 Summarizing the results from Part II

The focus of this section was on intra-network variation in media use. That is, under what conditions are people going to use a variety of strategies with their alters, and under what conditions will they use a consistent strategy. If networking is about accessibility, these are two ends of a scale with one implying "I have a stable strategy, know it and you can easily access me" and the other implying "I will use whatever is necessary to get in contact with you, and to make myself accessible". One pole is about consistency and the other is about accommodation. But unlike the prior chapter where I partitioned individuals into mutually exclusive categories, here I merely plotted these strategies on a spectrum of particularity. The benefit of having a single scale of particularity is that I can then model particularity in a relatively straightforward fashion. I employed this model to test five specific hypotheses about variation in networking. The first three come from Wellman's theory of networked individualism. To these I added overall planning propensity and sociodemographic characteristics, most specifically, immigrant status.

Hypothesis 1 (on media use) was a non-linear relationship between Internet use and particularity. That is, since the Internet affords different perceptions of one's network, heavy Internet users will employ a more particular strategy, although mere use of the Internet will not be associated with more particular networking. This hypothesis was validated. Heavy Internet use persisted as a significant variable throughout all models, even when controlling for overall planning propensity. Given that the coefficient as well as the level of significance remained stable (at approximately $b = 0.4$, $p < 0.03$ & $p > 0.01$) across these models, I consider this to be a strong finding. Heavy Internet use is not simply a part of frequent planning, but a factor in its own right.

Hypothesis 2 (on group composition) was that the presence of specific groups, namely roles with substantially more homophilous ties than heterophilous ones, would be associated with a more general strategy. That is, the more people one knows from

a specific group, the easier it is to coordinate with that group and to be in contact with group members in consistent ways. I cannot reject the null hypothesis in this case. The only group that contributed significantly to the model was the presence of online alters. Almost by definition these alters should make a difference since they are online only. All other roles did not contribute significantly.

While I suspect there are ever more complex ways to parse the relationship between role and variation in media use, I am hesitant to try and squeeze a significant finding from this situation. At least in this context, it appears that there is simply too much variation per role for these roles to be considered as singular forces acting on ego. However, the optimistic interpretation of this situation is that it reveals a clear distinction in how individuals think about their ties to alters and how they act on them. *They think in terms of roles, but employ specific media independent of the structure of these roles.*

Hypothesis 3 (on network structure) was that more fragmented networks would be associated with more particular behaviours and a less general approach to maintaining ties. Again, for the most part I cannot reject the null hypothesis in this case. Conventional structural variables were not significant. That is, particularity did not vary significantly with network size, density, number of components or centralization. In particular, number of components is a great example of network fragmentation. Each component that is not connected to other alters can be considered a separate sphere of life that has to be maintained by ego. It is highly plausible that one would have to be especially sensitive to different strategies in order to maintain more separate spheres, but this does not seem to be the case. This may have been presaged by the network examples given at the beginning of the previous section: "Cathy" was able to manage a very large number of dyads and isolates who were not close with each other despite not using email or the telephone. For her it was about keeping busy and finding alter-appropriate activities that were easily scheduled (such as a movie or stage

play). That keeping busy was Cathy's *modus operandi* also presages the result of the next hypothesis.

Hypothesis 4 (on planning) was that more planning overall would be associated with more particular media behaviours. This is indeed the case according to the models presented. While the coefficient for planning is small in this case ($b = 0.008$), one has to recall that this refers to times per month by any medium. To better appreciate the impact of the variable, consider that the mean value is 35.8 with a standard deviation of 38.1. So a person one standard deviation above the mean for planning will have a particularity score of approximately 0.3 more than average. It is also worth noting that it was a combination of planning scores, rather than any specific planning score that made a difference. In alternative models (available upon request), I tested individual planning scores (in person, by telephone, etc...) and discovered that only planning by cell phone was significant, but it was unstable and easily washed out by additional variables. Thus, it does not appear to be a matter of what media one uses frequently, so much as one plans frequently by any means.

Hypothesis 5 (on sociodemographic characteristics) was that recent immigrants would show more variety of media access relative to the rest of the sample. It was inspired by the fact that immigrants made up a disproportionate number of the individuals in the "daily online" social activity group and the commonsense understanding that they have restricted options to see many of their old ties in person. It turns out that this was a particularly apt intuition, as being an immigrant in the last five years was the strongest predictor of all. Indeed, it would appear that these individuals have to manage salient (and for the purposes of this analysis, consistent) social constraints. Alters from back home are not merely distant in spatial terms, but for those migrating east-west, time zones also complicate one's ability to maintain contact.

Overall these hypothesis paint a picture of media use variation that is sensitive to individual social location and propensity to use media, but not to social structure or

network composition. That is, one's propensity to use a diversity of strategies does not appear, at face value, to be associated with cognitive network structures. Fragmented networks are sustained through consistent acts while cohesive networks are sometimes sustained through variable contact. To answer the question of how media effect the relationship between how individuals think about their ties to alters and how they act on them, the answer is not that diverse networks lead to diverse networking or that simple coherent networks lead to simple strategies.

One explanation for this is that individuals simply do not think about their networks as a cohesive set of relationships from which to draw on for activity. Rather they think about specific relationships in relation to specific activities. Unlike in the business world of networking, where individuals are explicitly focused on maintaining not only a large structure of ties but a carefully crafted one, here we do not see a clear relationship between networking and social structure—on the network level. This means that concepts like "bridging social capital" are not as relevant as the *practice* of "keeping busy", "Getting hold of someone" or "knowing the right person". This is not to say an individual cannot employ instrumental strategies to prune and shape one's network, but that the use of media to do this can only accomplish so much. While there is evidence for coupling between media use and social activities, there is not the same coupling between media use and network structure.

6.5 Conclusion

It is taken as a given that people use various media with their alters. However, in explaining why individuals use either a consistent strategy or a series of person-specific strategies, there is little evidence that either the structure of the network or its composition plays a part. Heavy use of the Internet is associated with a more variable strategy as is frequent planning by any medium. Yet these are personal habits, not social constraints or structures. More groups (or more fragmentation) does not lead

to more fine-tuning, nor does having a larger network. Individuals often think about their network in terms of group structures and recent contacts. However, they do not necessarily act on their network accordingly.

Taken from another perspective, the question might be: is networking determined by the person's individual propensities, the person's social location or the person's social structure? Of all of these, an individualistic account of networking appears to be the most persuasive...to a point. Immigrants who have been in Toronto for five years or less demonstrate that they cannot remain entirely fixed in their networking habits, and that in order to maintain a balance of alters from both the old and the new worlds, they will have to adopt a fine-tuned many-media strategy. However, in other cases, I do not see evidence that people's social location has a significant or substantial effect on the variation of media use with their alters. Also, there is little evidence here that people who have large networks or fragmented networks adopt a particularly unique strategy for maintaining contact.

What I have termed an individualistic account does not, however, mean that this story is entirely in accordance with the assertions of networked individualism. Networked individualism is a story of networks—person-to-person, place-to-place or door-to-door. It suggests that there is a relationship between how individuals maintain contact with alters and the structure of these networks. Individuals with fragmented networks will maintain ties in unique and personalized ways. Individuals with dense cohesive networks will maintain ties in consistent and cohesive ways. However, I have complicated this story in two related ways:

1. In the first part of this chapter I have shown that this story is complicated by the cognitive biases that filter what we think of as the network in the first place. That is, some individuals think in networks, others think in groups, and others still in a hybrid fashion. Certain roles will be considered as a cohesive structure even if people are not networking with them on a frequent basis. Consider that

extended family members are among the least likely to be contacted monthly, yet they are frequently recalled by virtue of their association with close family.

2. In the second part of this chapter I have shown that networked individualism exists, but the fact that there are certain kinds of networks does not mean that these networks are strongly associated with particularistic person to person networking. Bt contrast, fragmented networks can be associated with coherent networking strategies (i.e., the same strategy for each fragment), whereas cohesive networks can be associated with particular strategies (i.e., contacts everyone in the group in specific ways).

One of the key advantages of networked individualism as a theory of networking is that it links media use processes with network structure. Person-to-person networking is a process, and we can think about this process as having a distinct effect on one's personal network. Yet, network structure as understood in the sociocognitive sense may not be the most apt place to look for this effect. Having a fragmented network is not the same thing as customizing one's use of media. In fact, the same personalized strategy (seen only from the perspective of media use) can be used in entirely different ways. An individual may be the force that keeps a group together because she seems to be preternaturally able to access all members of that group (by being very particular). An individual may conversely be able to sustain a fragmented network again through being very good at knowing how to access which individual.

So in an elliptical way, I can get closer to an answer for the question of how multiple media use can inform the relationship between how we think about our ties to alters and how we access these alters. Variations in media use connote a "will to connect" with alters more than a specific kind of network structure. Some individuals have a tougher job of maintaining their ties. This is why immigrants use a greater diversity of strategies. Some individuals try to leverage their comfort with new media. This is why heavy Internet users use a greater diversity of strategies. However, the will to

connect is an individual propensity, not a structural attribute. It is filtered through the unique and contingent histories of individuals, and amplified by personal challenges in maintaining a coherent social structure. But it is not about specific network structures, nor about specific roles. It is about how people translate a vague sense of a need to be social with the opportunities presented, and how much they are willing to step outside of a specific style in order to sustain contact across myriad roles.

This suggests that both the Internet and the mobile telephone do not themselves cause fragmentation or isolation, but rather enable individuals to network in ever more complicated ways with pre-existing networks. Some individuals, those who need to or those who are prone to plan extensively, such as "Priscilla", will glom on to these media as a way to sustain personalized contact. Others, such as "Roscoe" will find new media to be an irritation and remain bothered by the poor quality and seeming ambiguity of email messages. Yet, Roscoe still finds a way to access his alters while Priscilla might actually consider herself less busy if she only simplified her use of media.

This also leads to a reevaluation of networked individualism as an expression of autonomy (Wellman, 2002). Is the staid individual not exerting her autonomy by steadfastly refusing to network via the latest gadget? Is the networked individual being more autonomous by bending his habits in order to ensure he can reach whomever he wants (or needs) when the time comes? If anything, variations in contact across the network might actually show less autonomy rather than more. Consequently, *maneuverability* is perhaps a more apt phrase for networked individualistic networking than *autonomy*.

This is, in fact, an optimistic point for networking in everyday life. Increased personalization of media as well as its proliferation may involve new and specific avenues for interaction, but they may simply round out larger group structures, rather than fragment them. In fact, networking in past decades may have pulled individuals

away from a group-like structure if networking with all group members was considered too tedious or difficult. New media may actually allow individuals greater coverage as well as allowing them greater access. For this newfound maneuverability, the cost is not necessarily the fragmentation of ties, but the increased complexity of sustaining them.

But the optimism is not total. If maneuverability is an apt term for networked individualistic networking, then it stands to reason that some individuals are better at it than others. To maneuver is to move with skill and care. That networking in everyday life should be a skillful trait is perhaps surprising. One may think networking in everyday life as casual get-togethers, days at the beach or a walk to the neighbourhood pub. Yet, in reality, it involves the need to manage diverse schedules, differential media use, and alters who may not be able to plan autonomously without ego. Thus for some, a set of clear media use norms rather than the potential for maneuvering around individually personalized networking strategies might be a welcome change. But if anything, it seems that more personalization and more maneuverability, not less, is part of the shape of things to come.

This chapter looked at overall network effects. At this level most of the relationships between structure and media use were implied or muted. Being that the personal network is only partially under the control of the individual, and then it still is mediated by cognitive biases, the entire network might simply be too noisy to tell a clear story of the relationship between media use and social structure. As such, the next chapter will present a counterpoint (in the musical sense) to these findings. That is, how do individuals decide which medium to use with which network member? Instead of modeling media use with network structure, I model media use with specific individuals while controlling for network structure. Even if differences in structure are not associated with variations in overall networking patterns, structural differences may still play a role on a smaller scale. If networking is indeed an individual

rather than structural matter, then the analysis of networking with discrete individuals may help fill in details about how media use comes between the individuals one considers close and the individuals one actually maintains relationships with.

Chapter 7

Media use with specific network members

7.1 Introduction

IT is not always easy to get ahold of one's friends. They may be out playing sports, walking the dog, in a meeting, traveling, or just too busy to respond. Yet, regardless of context, most individuals have a means for contacting them most of the time. Even presidential candidates have a direct line regardless of place, as 2008 Republican aspirant Rudolph Giuliani illustrated with notorious (and possibly staged) cell phone calls from his wife during campaign speeches (Dobbs, 2007). But cell phone numbers are not listed in a comprehensive and searchable directory. Neither are emails nor instant message handles. Moreover, even if one's landline number is listed, one might be at the office under a different number. From one perspective, this is a complete mess. Gone are the earlier days where everyone's name was listed neatly in a phonebook found on every desk, or in every kitchen. Instead, people rely on a hodgepodge of address books, post-its, memory, past email messages, numbers scribbled on backs of used envelopes, and infrequent calls to others asking "do you happen to have her number?"[1] From another perspective though, this is a sensible response to a need to regulate social accessibility. The unsolicited contact industry is big business. Easily searched directories mean easily exploited targets for direct mail, telemarketers, and

[1]See pages 184-187 of Wellman and Hogan (2006) for a more complete discussion of the use of such tools to manage contact information.

spam. Both the Canadian government and the American government have put in place standards to ensure this privacy (Katz, 2006; Gatehouse, 2005). Now privacy, vis-á-vis the choice to whom people give their number, has greater value than the directory. Now, individuals selectively give out their contact numbers to others on the assumption that it helps regulate their availability. For example, Licoppe and Heurtin (2001) show that increased exchange of mobile phone numbers between individuals leads to a very clear increase in communication between those individuals.

Within this context of shifting accessibility and the unsettling adoption of new technologies, I can ask if there are any guiding themes to the way individuals organize their access to each other, and by what media. Several scholars have made compelling contributions to this question. Many of these contributions rest on qualitative assertions of actors as 'rational' in how they decide which media to use, and to a lesser extent who they use it with (Madell and Muncer, 2005; Kling, 1980). Among them, Haythornthwaite has made an especially relevant contribution vis-a-vis her doctoral work and subsequent study of distance learners. Along with Wellman, she coined the term "media multiplexity" to stand for the way individuals have multiple points of access across several media (Haythornthwaite and Wellman, 1998). She contends that there is a strong relationship between the tie strength between ego and alter and the number of media shared between ego and alter. In short, the stronger the tie, the more media used.[2]

This hypothesis offers a powerful explanation for the usage patterns of media within personal networks. Moreover, the relationship between media use and tie strength was presaged in Zerubavel's original discussion of social accessibility.

> [G]iving others one's telephone number—especially if it is not listed in the

[2]A note on language is apt here. When I discuss tie strength, I am referring to socioemotional closeness, the datum used throughout this dissertation. However, given that I discuss both socioemotional closeness and spatial proximity (physical closeness), it is perhaps easier on the reader if I simply refer to tie strength and proximity, and use the word "closeness" as little as possible.

> telephone directory—is a most significant act of displaying accessibility to them. Aside from the practical significance of granting them actual access to one, it also serves the function of symbolically incorporating them into a selective and exclusive social circle of intimates (Zerubavel, 1985, 145-6).

However, it is really the case that individuals give greater access to those with whom they have stronger ties? Since tie strength is a multidimensional construct combining frequency, reciprocity, affect, and self-disclosure (Granovetter, 1973; Marsden and Campbell, 1984), do these factors congeal into a single force acting on the way individuals regulate their accessibility? Or rather, is it the case that media multiplexity has previously been under-specified. Granted, tie strength may correlate with increased access and use of media, but that is not the whole story. Rather, several factors such as the embeddedness of the alter, their proximity to ego, their role and even the age of ego and alter can play a part in explaining differences in the number of media used. Thus, I conclude this chapter with a discussion of a more general paradigm that incorporates many of Haythornthwaite's ideas (such as latent tie theory) into a more general understanding of networking as the regulation of social accessibility.

This chapter again uses data from the Connected Lives project. Like the last chapter on the organizing principles of networks, this chapter relies on the social networks captured during the interviews. For each interview we performed a 'minisurvey' of selected alters in the networks. These alters were carefully selected using a specially-developed algorithm that ensures there is equal weight given to a diverse set of alters that were both very close and somewhat close. Details about this particular sampling technique have been addressed in Chapter 4 as well as Hogan et. al. (2007). In short, I assert that these sampled individuals fairly represent the social network as a whole. The minimum number of minisurveys per network is 3 (which was every individual included in one respondent's small network) up to 15 (which was the specified cut-off for the number of minisurveys). Each minisurvey asked questions about alter's role,

age, spatial proximity and media use.

7.2 Media multiplexity hypothesis explained

In "Social Networks and Internet Connectivity Effects", Haythornthwaite (2005) lays out a coherent and extensive set of theoretical propositions about the ways that the Internet may shape personal networks and networking. This is not done with the Internet as the focal point, but as one of many ways in which individuals communicate. This is an example of the sort of holistic analysis of communication media that I seek to pursue. These propositions are based on prior work she has done with Wellman and other collaborators about the role of media use within an organization. Three propositions are as follows:

- *Media multiplexity*: Those more strongly tied use more media.
- *A unidimensional scale of media use*: There is a single unidimensional scale of contact with peers akin to a Guttman scale of media use. Guttman scales are ways of ordering preconditions. For example, one would have a telephone before using email, and then use email before using instant messenger.
- *Latent tie theory*: The addition of a new media into an existing media ecology enables individuals to access alters that they would not otherwise access.

These three propositions lead to a perspective of media use that I term the "Fort Knox theory of social connectivity". Everyone who works at Fort Knox gets a key to the front door. Likewise, everyone in the personal network gets to interact with ego by one keystone medium/context, presumably in-person interaction. Those who are not merely weak ties also get access to the inner areas of the vault (i.e., they can access ego by the email) while those who are the strongest ties actually have access to all the wealth stored right in the center. These strongest ties access ego in person, via

telephone and via email. Adding another media is like building another wall around Fort Knox—more people can get inside the first door or maybe an alternate door, but it is still just as difficult to get into the control room and the vault.

I believe there is a lot of truth to this metaphor. Individuals do guard their privacy and seek to maintain social accessibility. However, as was shown in Chapter 5 on media styles, it is difficult to suggest that in everyday networks there is a single scale of media use, at least one that unilaterally applies to all sorts of networking styles. For the group in that chapter that used all media *infrequently* (termed the "all light" group), there was an inverse correlation between frequency of use of mobile phones and email. Those who supplement the core of in person and telephone contact did so in different ways, suggesting a certain media preference. Also those individuals who mainly networked in person used cell phones more than landlines to supplement their planning. Hence, one can see that people prefer to use a select combination of media that is conditioned by the alters they need to access, but is neither determined by them, nor by a single unifying scale. So in that chapter I referred to an *ecology* of media styles, rather than a *nesting* of media styles. Similarly, in everyday networks, as opposed to academics or students, the mere reason for being in the network can vary significantly. In Haythornthwaite's studies, as well as the study by Koku et al. (Haythornthwaite, 2005; Koku et al., 2001), individuals are all at least 'peers', either as academics or students. In everyday life, however, there is not the same base reason for being included in the network—some are friends, others family and others still are organizational members. This means that the institutional norms that might encourage email as a first point of contact are not so obvious in everyday life; some alters may love email while others do not own a computer. On one hand this makes Haythornthwaite's studies perfectly suited to testing the media multiplexity hypothesis for they are relatively homogeneous populations all starting from a reasonably static baseline. So while this may highlight the validity of the MMH, it also masks many other forces

that are present in everyday life which might either be absent or muted given the scope conditions of a more controlled organizational setting. Finally, there is the matter of a rather dyadic sentiment, both in the metaphor and in the original work. In Haythornthwaite and Wellman (1998), dyads in the network were considered, although the analysis did not control for the relative prominence of individuals.

One issue with the Fort Knox metaphor, and the theory it represents, is that it seems very dyadic. It is like everyone has their own specific keychain for Fort Knox, and ego is the only person who decides which keys a person holds. However, individuals are not merely accessed through specific pre-ordained media. They are also accessed through triads. A triad means that one party can relay messages between the other two. It also means that one party can relay contact information between the other two. For example, it is common for me to ask my mother for the current contact information of many of my relatives. This is also borne out in the data as 72 percent of the survey respondents report that they ask someone else for a phone number at least monthly. Thus, it seems likely that there is an under-analyzed structural dimension to media multiplexity and that by specifying this dimension I can more fully explain media multiplexity.

Bearing in mind the above theoretical discussion, I present five hypotheses about the media multiplexity hypothesis:

- **Hypothesis 1: Individuals will have role-specific values for media multiplexity.**

  As mentioned above, Haythornthwaite's original work was done among individuals who shared very similar roles, generally as academics. However, in everyday life, individuals are kin, friends, neighbours, and organization members. This should lead to differences in levels of accessibility.

- **Hypothesis 2: More highly connected individuals will share greater numbers**

of media with ego.

Above I referred to this analysis as moving beyond dyads towards network structure. Highly connected alters may be gatekeepers to one's personal network. Regardless of the strength of the relationship between ego and alter, if alter is highly connected, then alter may serve as a gatekeeper in that network. As a gatekeeper, ego may rely on them for contact with other network members, and vice versa.

- **Hypothesis 3: More spatially proximate individuals will share greater numbers of media with ego.**

  This suggests that media have a primarily instrumental purpose for in-person social coordination. Those who are nearer will benefit more from using many media, since it means more ways to coordinate with these individuals. This is especially relevant when people need to access each other in a short time frame—which is more common among individuals who are trying to jointly coordinate in-person social activity. For example, if I am waiting for a friend at a coffee shop and if I cannot reach that friend by calling her landline, then it helps to have her cell number or email address in the hopes that I can reach her.

- **Hypothesis 4: Alters in more frequent in-person contact will share greater numbers of media with ego.**

  This hypothesis works with the above hypothesis that the more frequent individuals see each other in person, the more they will want to reinforce their meetings with mediated contact.

- **Hypothesis 5: Controlling for the above factors, tie strength will not be a significant predictor of the number of media used with alter.**

  The above hypotheses refer to many dimensions of tie strength in personal net-

works. If they sufficiently capture the relevant dimensions of tie strength as it relates to the number of media used, then tie strength will no longer be significant. However, if the significance of tie strength persists, then there are other aspects of tie strength that are not adequately specified in this model.

7.3 Which alters are accessed (or accessible) by media

Not all media are available to all individuals. Haythornthwaite's original work was done in a context where virtually all students or collaborators had access to similar media. Yet, individuals who have a cell phone do not necessarily give their number to everyone. Similarly, individuals who email their networks do not email everyone who has an address. These issues tell us a lot about the relative role of media in sustaining ties to alters. This section examines the relationship between those alters that are accessible by media and in person versus those who are regularly contacted by these media. The purpose of this analysis is twofold. First, this will help familiarize the reader with the measures and distributions which are later used in the multilevel models of media multiplexity. The second is to promote the idea that new media are primarily used to maintain contact with very close network members rather than one's weaker ties. Or at least, they are used with a small slice of the network rather than most of it. This latter claim is somewhat controversial as several scholars have related media use with network size and the ability to harness weak ties (Boase et al., 2006; Zhao, 2006). While I accept that there are times when many individuals are emailed, this is not the same as suggesting that email is one of the key ways in which full personal networks are sustained.

Figure 7.1 shows the distribution of media use with ego's personal network. The data comes from the social network minisurveys. Each chart shows the percent of al-

ters contacted monthly for 84 personal networks.[3] Each chart has a discernible shape. The charts for in-person, socializing, and telephone contact display a logarithmic distribution while the charts for mobile phones, email, and instant messaging show a linear distribution among the network members who used these media. The trend lines in each chart indicate how faithfully the sample matches the proposed distribution. In all cases, it can be considered a very good fit, with the R^2 values for every distribution being above 0.95.

The biggest differences in this chart are clearly between new media and old media. These differences accentuate the problems inherent in a tidy model of media multiplexity in everyday life. Firstly, the new media are not uniformly adopted by the population. All respondents telephoned, socialized or saw in person at least one other network member in the last month. Yet, many of the respondents did not email, call by mobile phone or instant message any of their network members. Many of these zeroes are obviously due to those who do not have access to the media, but that should not be taken as code for the respondents not being able to gain access to these new media. Virtually everyone in the study had the economic means to afford a computer. Many respondents were simply disinterested in adopting this form of connectivity. This especially marks the difference between instant message use and email. If they are emailing these people, they almost certainly also have the equipment ready for instant messaging, even if they do not use it.

The difference between new and old media also show in the distributions of proportion contacted monthly. In-person, socializing, and telephone proportions show a logarithmic distribution, whereas email, mobile, and instant messaging show a linear distribution. These distributions are non-trivial. A log distribution means that starting from zero, the value on the y-axis moves upwards very quickly and then levels

[3]Two of the 86 interviews completed a social network, but did not complete the minisurvey as the interview was cut short and the interviewers could not re-connect with the interviewee.

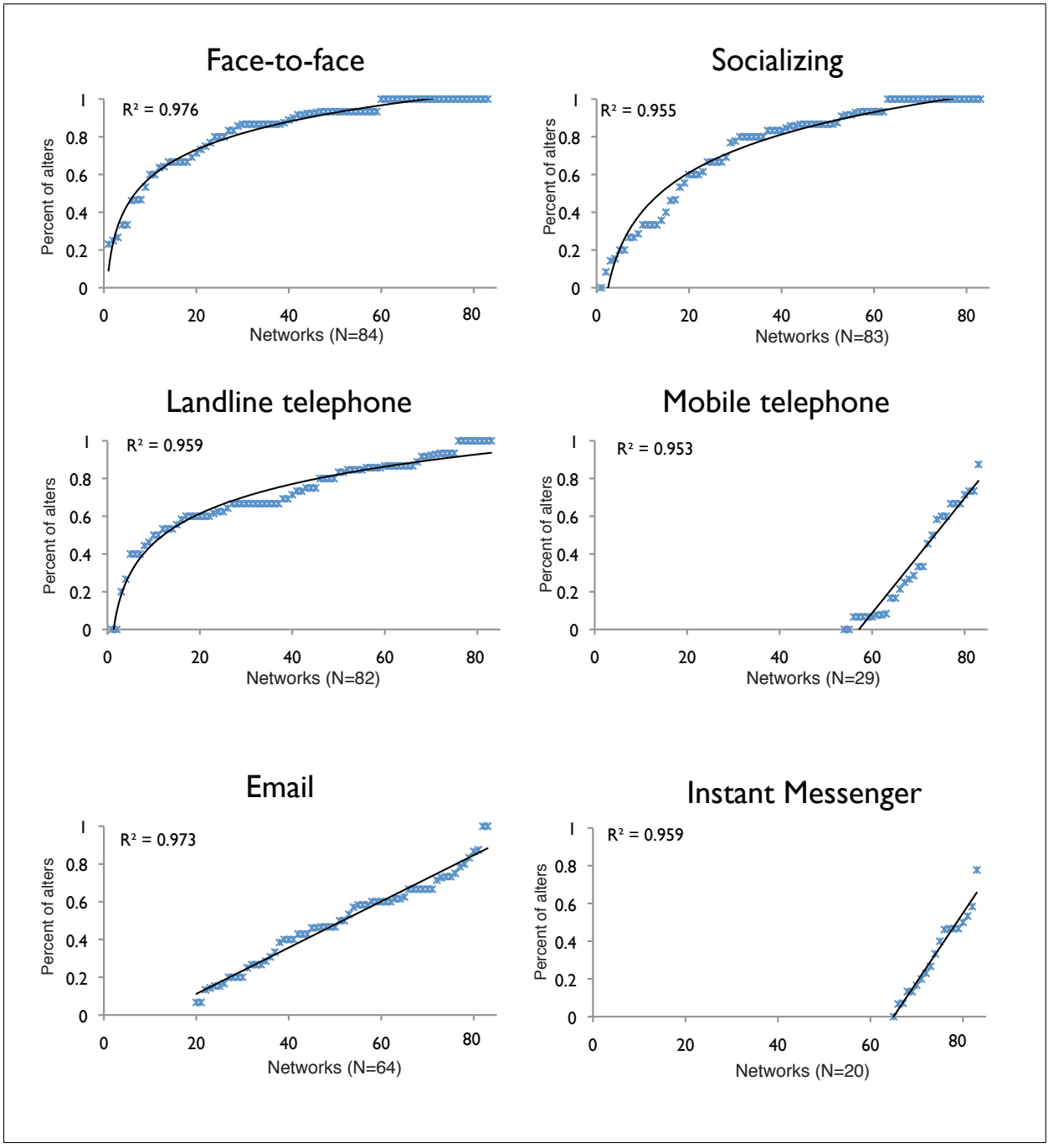

Figure 7.1: Distributions of the percent of alters contacted by media

off. A linear distribution means that starting from zero, there is a steady increasing distribution of the percentage of ties contacted , with no particularly steep climb nor a particularly level area at the top. These two different distributions highlight two different logics at play. For in-person, socializing, and telephone, most people contact most of their alters at least monthly. One can expect to see alters monthly (or semi-monthly) as well as expect to be seen by them. Also, most people expect to call or be called by most of their alters at least monthly. As such, it makes it to see this as a habitual part of networking in everyday life. There is less consensus, however, about how much of the network is maintained by ICTs. A linear distribution means that the probability of ego emailing an alter is quite ambiguous. People who email their alters are just as likely to email a small share of them as they are to email most of them. Same for instant messaging and cell phones. Differences in network size notwithstanding, people are just as likely to call a few of their alters via cell phone as they are to call most of their alters.[4] Thus, the use of ICTs appears to be at least partially a personal decision, based on one's media tastes and ability to access network members rather than a cultural convention. This harkens back to Swidler's discussion of the cultural toolbox during settled and unsettled times (1986). At least in everyday life in 2005, telephone and in-person contact appears to be a settled part of the conventions for networking; email, mobile phones and instant messenger do not.

This is important for an analysis of media multiplexity in personal networks—it means that one cannot rightly perform an analysis of media multiplexity via dyads alone, as individuals operate on different logics in their network about how many individuals they are going to contact via any medium.

[4]It is important to note that this claim does not take into account differences in the size and structure of the network. If this was done, one can see that those with larger networks email a disproportionate number of these individuals. However, I believe this says more about the specific individuals than the media, especially considering the findings in Chapter 5 about how heavy communicators use all media at their disposal.

7.4 Dyadic reports of media use

Two dependent variables were posited for this analysis. The first includes seven possible "points-of-access": face-to-face, socializing (which is considered a subset of face-to-face interaction, where the former can include chance meetings and propinquity), landline telephone contact, calling by cell phone, calling to a cellphone, email, and instant messaging. Admittedly, the first two are not media. However, they have been included in analyses up to this point since they are of making contact with other individuals. Moreover, as mentioned in Chapter 2, in-person interaction has certain affordances for social activity, just like media. By taking an affordances-oriented view, there are plausible reasons for considering in person and social activity, and including them as separate variables. Some individuals have network members who they never see anymore, but still keep in contact occasionally via telephone and via email. Also, many respondents would know people they consider at least somewhat close alters but do not socialize with them. This may lead to different ordering principles in the network—if you see your neighbour frequently but do not socialize with him, how would that play into your willingness to be accessible to him via many media?

Fortunately, the parameter estimates were relatively close whether in-person and socializing were included, or whether they were excluded. Given that these terms give the variables a larger range and a more normal distribution, thereby increasing the potential for stronger estimates, this expanded variable is preferred.

Figure 7.2 shows the distribution of the number of media-contexts used, characterized in two ways. The lighter bars in back show the percent of dyads that use the specified number of media-contexts. The darker bars in front show the distribution of the mean values per network. As one can see, unsurprisingly, the mean values per network cluster together far more tightly. Individuals, in general, use three-to-four media with their alters. Very few alters were contacted by six-to-seven media, and not

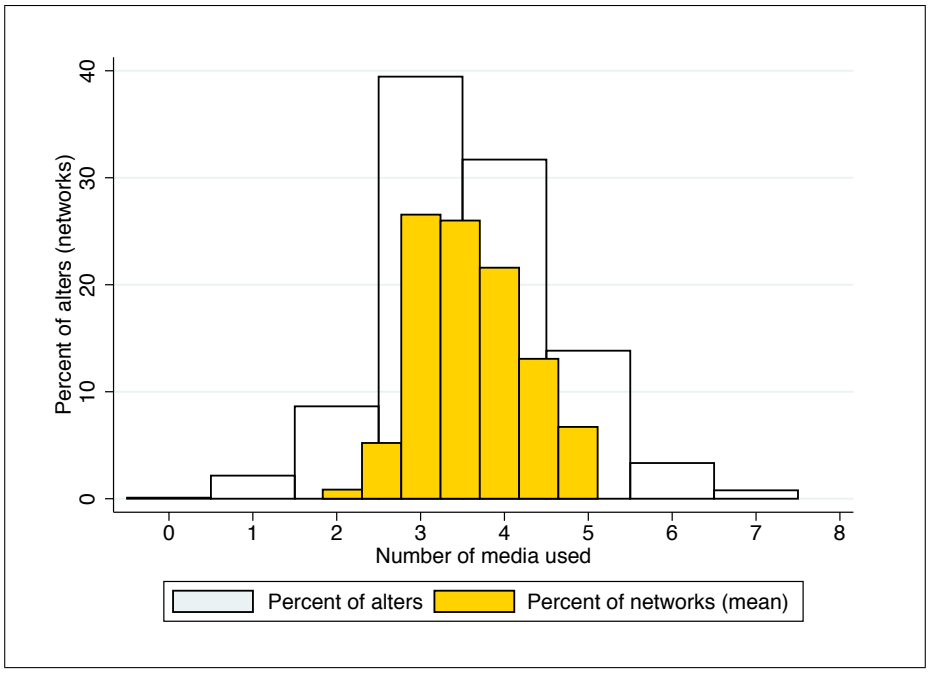

Figure 7.2: Distribution of number of media used by alter and network (average)

even the most ardent networker uses more than five media on average with all of their alters. This 'regression to the mean' helps to illustrate that even though individuals may reciprocally reinforce or condition each other in terms of the number or intensity of media use, this is not the case for all network members. Ultimately, ego will want to include some people that he neither wishes to access via every medium, nor is it even possible as not everyone included uses every medium.

7.5 A multilevel model of media multiplexity

This model seeks to test the theory that tie strength leads to increased numbers of media used with alters. In theoretical terms, this suggests that individuals are actively regulating their social accessibility by maintaining higher levels of access to those with whom they feel there is a stronger relationship. Yet, there are practical reasons why people use certain media with their alters. They may be proximate, well-embedded, and frequently in contact. Yet, if after controlling for these factors, tie strength is still a significant explanatory variable, then I can consider media multiplexity a robust

theory, and a relevant one for understanding how people decide which media to use with which alters. By implication, this will also point to media multiplexity as a useful theory for understanding everyday networking.

This analysis proceeds as a series of nested models demonstrating the overall story that the relationship between tie strength and the number of media used is under-specified. That is not to say that the correlation is spurious. As I am dealing with cross-sectional data, it is difficult to say which covariates cause others. For example, one of the highly significant variables in the model is degree (that is the number of links that alter has to others in the network). A theory of triadic closure suggests that individuals link two alters together, because both alters are strongly tied to ego (Granovetter, 1973; Simmel, 1950). So, in some sense I can suggest that degree is an intermediary between tie strength and number of media-contexts used. Thus, my assertion is not that tie strength is a spurious causal factor, but that the processes leading to media multiplexity are under-specified.

7.5.1 Within network variance (the variance components model)

I begin with the simple model that assesses whether there is sufficient variance between networks in order to consider using a multilevel model. If the error terms are correlated within networks (meaning that there are network-specific biases), then standard regression tests will give insufficient and biased estimates. Most personal network studies assume that a multilevel model is warranted since alters nested within network behave very differently across networks (or reportedly behave very differently according to the respondent, van Duijin, van Busschbach, and Snijders, 1999; Wellman and Frank, 2001). This is especially the case when considering media use since some egos do not have either a mobile phone or a computer. Media do not cleanly substitute for one another; people who buy a computer do not give up their telephone. Rather, many studies have shown that email and instant messaging seems

to add on to other forms of communication rather than substitute for them (Carrasco and Miller, 2006; Madell and Muncer, 2005; DiMaggio, Hargittai, Neuman, and Robinson, 2001; Quan-Hasse and Wellman, 2006). As such, it is important to take this variation among networks into account.

The variance components model was performed using `xtmixed` in Stata with Maximum Likelihood Estimation.[5] The results of this model are shown in table 7.1. This model does not include any variables as it is merely a test of the variance between and within levels. Two important values here are $\hat{\psi}$ and $\hat{\theta}$. These represent the variance between networks and within networks, respectively. The likelihood ratio χ^2 test of $\hat{\psi}$ shows that it significantly varies from zero, and thus I can reject the null hypothesis (i.e., I need to take into account different networks, and not merely examine the relationship across dyads). There are two other significant facts about $\hat{\psi}$ and $\hat{\theta}$. First, I can assess the performance of future models by comparing the values of these two scores. Lower values in subsequent models will indicate the percentage of unexplained variance reduced. The second fact is that I can calculate the percentage of unexplained variance in this model that is due to level-1 factors (differences in dyads) and how much is due to level-2 factors (differences among networks). To assess how much of the variance is at each of the two levels, one simply divides either $\hat{\psi}$ or $\hat{\theta}$ by the sum of these two values. To assess the overall variance reduced, the equation as given by Rabe-Hesketh (2008) is:

$$R^2 = \frac{\hat{\psi}_0 + \hat{\theta}_0 - (\hat{\psi}_1 + \hat{\theta}_1)}{\hat{\psi}_0 + \hat{\theta}_0} \tag{7.1}$$

To assess the proportional reduction in variance at level-1 (the alter level), the equation

[5]Stata offers several packages for the estimation of multilevel models. `xtmixed` is a fast native package, although it has limitations for more complex models with cross-level effects and random coefficient models. In such a case one can use the `GLLAMM` package. Since `GLLAMM` models did not significantly alter the results but did make the presentation significantly more complex, I will only be presenting the random-intercept models via `xtmixed` herein. Moreover, the authors of `GLLAMM` encourage individuals to use the `xtmixed` mixed package unless necessary (Rabe-Hesketh and Skrondal, 2008).

as given by Raudenbush and Bryk (2002) in this notation is:

$$R_1^2 = \frac{\hat{\psi}_0 - \hat{\psi}_1}{\hat{\psi}_0} \tag{7.2}$$

Similarly, to assess the proportional reduction in variance at level-2 (the network / ego level), the equation is:

$$R_2^2 = \frac{\hat{\theta}_0 - \hat{\theta}_1}{\hat{\theta}_0} \tag{7.3}$$

In this case 70 percent of the variance is at level-1 (the dyad level) while 30 percent is at level-2 (the network level). There is more variation within networks than between networks. This makes sense from a media multiplexity perspective, as individuals within all networks are afforded fewer media the weaker the tie. However, it also points to the need for a multilevel analysis of this question. The subsequent random-intercept models will use the $\hat{\psi}$ and $\hat{\theta}$ values from Table 7.1 when calculating the proportional reduction in error (i.e., the R^2).

	Est.	Std. Err.
Constant	3.607	0.070
$\sqrt{\psi}$	0.587	0.055
$\sqrt{\theta}$	0.891	0.021
Log-likelihood	-1403.684	—

Table 7.1: Variance components model of the number of media used with alter by network

7.5.2 Random-intercept model with covariates

Multilevel models are expensive in terms of both the degrees of freedom as well as computational power. This means that standard errors are going to be much larger in a two-level model than in an ordinary regression. For this reason, only a small purposefully selected set of variables are included, rather than all possible covariates. This forward-selection style of model-building based on the theoretical reasons for variable inclusion is generally preferred, both for considerations of speed, and

because spurious variables can mask more significant ones (van Duijin et al., 1999; Raudenbush and Bryk, 2002). As this is a relatively simple model with no random slopes, cross-level effects or interaction terms, I will focus on the inclusion of selected variables based on the above hypotheses. I examine three random intercept models to assess the proportional reduction in variation, and to understand the behaviour of tie strength across models. The first model merely includes the variable 'ring'. If one recalls from Chapter 4, participants arranged alters on a large sheet with concentric rings. The inner ring included the individuals who are the most strongly tied, while the outer rings included weaker ties. This measure strongly correlates with the traditional 'somewhat' and 'very' close measures, however it adds additional granularity that should facilitate better estimation.[6] For this variable, the innermost ring is given a value of 4 while the outermost ring is given a value of 1. Thus, a positive value means a positive association with increased tie strength. This value has been group-mean centered.[7] This is important since not everyone used all four rings. This way, I can assess deviations from an average tie strength value for each respondent.

The next model includes qualities of alter, ego, and their relationship. Specifically:

Age (ego's age and alter's age [group-mean centered]): I include a continuous measure of ego's age as well as a continuous measure of alter's age. Given that adoption rates of mobile phones and Internet vary substantially by age (Ling, 2004), this is an important control. Raw age scores performed much better than relative age scores (i.e., difference between ego and alter's age), suggesting that the relationship between media use and age is more related to social trends regarding media uptake and other age-related factors, such as personal mobility, than to differences between ego and alter. To note, this analysis uses a mean centered approach. The mean age for this

[6] Additional details about the correlation between somewhat/very close and these rings are found in Section 4.7.6.

[7] There is an unfortunate aspect to the terminology here. Group mean refers to the mean for a specific collection of alters. So indeed, at least for the purposes of properly centering variables in these models, a group *is* a network.

sample is 43. So a coefficient represents a 1 year increase or decrease from this age on the number of media used.

Kin/non-kin: Despite having a rich granularity of possible roles, as mentioned in Section 4.7.4, the optimal distinction in these models was merely the kin/non-kin distinction. Kin in this case includes extended family members as well as immediate family. It is a dichotomous variable.

Have a computer: This is a dichotomous ego-level variable about whether or not ego has a computer. Since two of the possible media are computer based, I control for this significant difference. To note, even those who do not have a computer at home may access others via email at work or elsewhere, although this is uncommon in the interviews.

Distance to ego (group-mean centered): This is a measure of the distance in kilometers between ego and alter. It has been log transformed to better represent differences in orders of magnitude (where 1 and 100 kilometers makes a far bigger difference than 2000 and 2100 kilometers).

Structural metrics (degree and density): Despite the bevy of possible structural metrics available, only the most basic metrics (degree and density) had any effect on the overall models. This is fortunate as these two measures are easily interpreted. Degree represents the number of ties shared between ego and alter, whereas density represents the overall number of connections in the network. Theoretically, this means that alter is more embedded in ego's personal network. Degree ranges from 0 (for an isolate) to 23 (the highest observed value). Density ranges from zero to one, where zero means no alters are tied to each other and one means all alters are tied together.

The third model includes communication frequency between ego and alter measured in terms of days per year. These variables include frequency of in-person contact, socializing, telephone, email and instant messaging. Since there were great asymmetries in the frequency of contact, the variables have been log transformed. Much

like distance, this allows for media use to more effectively represent differences in the order of magnitude between frequent and infrequent contact.[8]

As is common in multilevel models, most of the variables have been group-mean centered. This is a common practice in HLM work, so much so that some books advocate an almost ritualistic adherence to this particular transformation (Wheaton, 2004; Wellman and Frank, 2001). Group mean centering usually decreases the standard errors while having little effect on the overall parameter estimates (Gelman and Hill, 2007). However, its use is not always ideal. When one is interested in the raw count for a variable, and interpreting this same raw count across respondents (alters in this case), a raw variable can make more sense. Also, as Raudenbush and Bryk point out:

> In some applications, of course, an X value of zero will in fact be meaningful. For example, if X is the dosage of an experimental drug, $X_{ij} = 0$ implies that subject i in group j had no exposure to the drug. As a result, the intercept β_{0j} is the expected outcome for such a subject. That is $\beta_0 j = E(Y_{ij}|X_{ij} = 0)$. We wish to emphasize that it is always important to consider the meaning of $X_{ij} = 0$ because it determines the interpretation of β_{0j} (2002, 32).

In this case, a degree of zero is an important and meaningful number—these are the 18 percent of isolates in the data set. Moreover, in this particular model, I am interested in the number of mutual ties, not deviation from an average number of mutual ties. In all other continuous level-1 variables the parameter estimates are meaningful and indeed more significant using a group mean centered approach.

[8]Telephone frequency is a composite measure that includes both cell and landline contact. This is due to the nature of the question asked. The data permits me to know whether or not ego and alter used cell, landlines or both as dichotomous values (which is why I could produce the distribution plots of cell phone use above). However, it only asked about frequency of all combined telephone contact.

7.6 Results

The multilevel models show that tie strength is indeed related to the number of media chosen but that its relationship is unstable and dependent on the other variables in the model. The first non-null model simply includes tie strength. The standard error is 1.56 and there is a tiny (less than one percent) reduction in variance from the null model. This value is found at the bottom of Table 7.2. Superficially, this does not bode well for the media multiplexity hypothesis, at least once you get beyond the threshold of 'strong enough to be included in the personal network'. To note, a similar model using the dichotomous variable for somewhat close versus very close was similarly non-significant.

Interestingly, tie strength performs much better with the inclusion of controls. First, this suggests that the variable is somewhat unstable, but also that there are numerous reasons other than tie strength as to why an individual might want to increase their accessibility. For example, merely being more proximate to ego means that ego will be more likely to use a cell phone (due to exorbitant charges). Thus controlling for this factor seems to be an effective way to *accentuate* the effect of tie strength. This model has an overall R^2 of .14. As one can see from R^2 values, most of the variance explained is at the second (network) level. That is to say, most of the variation from these controls explains differences between networks, rather than differences within networks. This is understandable given the important level-2 controls such as having a computer and age.

The effects of age are particularly expected. As noted above and found in the literature, older people are more likely to be late adopters of technology. Since it 'takes two to tango', the model accounts not only to the respondent's age, but the age of alter. The interaction term was non-significant, suggesting that these are independent effects, and not a matter of either the relative age of ego or alter, nor the relative dif-

	Model 1 Tie Strength		Model 2 Demographics		Model 3 Comm. Freq.	
	Est.	p	Est.	p	Est.	p
Closeness (gmc)	0.050	0.099	0.086	0.007	-0.018	0.546
Have computer			0.571	0.001	0.531	0.002
Alter's age (gmc)			-0.015	0.000	-0.007	0.000
Ego's age (mc)			-0.009	0.033	-0.010	0.021
Is kin			-0.200	0.006	0.032	0.592
Distance (log,gmc)			-0.032	0.011	-0.010	0.454
Degree			0.031	0.005	0.013	0.147
Density			0.793	0.028	0.878	0.014
In-person (log,gmc)					0.040	0.055
Socializing (log,gmc)					0.199	0.000
Telephone (log,gmc)					-0.084	0.000
Email (log,gmc)					0.227	0.000
Inst. msg (log,gmc)					0.160	0.000
Constant	3.601	0.000	2.967	0.000	2.966	0.000
$\sqrt{\psi}$	0.586		0.459		0.499	
$\sqrt{\theta}$	0.890		0.856		0.677	
R_2^2	0.006		0.388		0.277	
R_1^2	0.002		0.077		0.421	
R^2	0.000		0.137		0.223	
Log likelihood	-1402.322	0.099	-1290.584	0.000	-1084.628	0.000

Table 7.2: Nested random-intercept models predicting number of media (including face-to-face and socializing)

ference in age between ego and alter. It is simply an effect of the fact that there is a negative relationship between diversity of technology and age, and one that is worth controlling for. Again, this helps to increase the significance of tie strength. Once controlling for the fact that older individuals are less likely to use many media, for whom will these people make exceptions? Their most strongly tied alters.

The variable "is kin" is a significant contributor to the model. The coefficient is negative meaning that all else equal, individuals will use fewer media with family members than with other individuals in the personal network. I believe this speaks to the logic of how individuals are included in the personal network. Namely, individuals who are family are a part of the network partially because they are family, not because ego actively maintains as solid a relationship with these individuals as with other alters. As Fischer has noted, urbanites are rather selective when considering kin in their network. He notes that "the decline in kin involvement with greater urbanism is less a sign of family disintegration and more a sign of selective family integration" (Fischer, 1982, 84). Fischer was referring to the inclusion or exclusion of family members in the network. However, it can also be extended to the inclusion or exclusion of family members into the 'inner circle' of accessibility via many media. This is to say there are different thresholds for inclusion. While one threshold might be 'named in the network', another would be access by media. Family members might have an easier time passing through the first threshold but not the second. This is corroborated by Marin's work on recall in name generators (2004). She finds that individuals often recall clusters of individuals. Since family have a discernible kin structure, people are likely to list off a large set of family members simply because they come to mind when people think about a few salient family members.

Curiously, the effect of being a family member is reversed once I include the frequency of contact. However, this value is insignificant suggesting that once I include communication frequency there is simply too much variation among family members

to make a clear claim about the number of media used.

The effects of network structure show a pattern that some might consider obvious, while others consider surprising. Under a logic that individuals will want to optimize their accessibility with their alters, I initially thought individuals of lower degree would have greater media use. This is in keeping with Wellman's networked individualism. Implicit in this theory is the idea that individuals compensate for a fragmentation of personal networks with the use of more media. This is in keeping with the idea of the 'person-as-portal'. For example, he suggests that

> [t]he shift to a personalized, wireless world affords truly personal communities that supply support, sociability, information, and a sense of belonging separately to each individual. It is the individual, and neither the household nor the group, that is the primary unit of connectivity (2001a, 238).

Yet, here I find that individuals who are of higher degree are also those with whom ego uses more media. That is, there is a structural basis to connectivity, rather than a solely individualistic one. Moreover, this result persists when removing individuals of particularly high degree (the top 20 percent, who have a degree of 15 more). Also there is no curvilinear effect of degree. That means this finding refers to a linear increase in social connectivity rather than being about a few very highly connected individuals. From an accessibility perspective as well as an efficiency perspective, this makes sense. Individuals will seek to make contact with those who share the most mutual ties. One would want to give greater access to those with whom one is the most embedded in a network of relations. Also, if one needs to plan a future event or distribute information to one's network, being available to someone who is tied to the most members of one's network makes sense. The effect of density is surprisingly strong, as well as robust. It suggests that all else equal, individuals in a fully connected network will be contacted by almost one more medium than those in a completely sparse network (where no one

knows each other). Part of maintaining a network as well as forging links across this network may be in linking network members together. However, this is a multi-causal relationship. Individuals may link each other via media, thus making the network more dense, or dense networks may make it easier to reinforce the sharing of contact information.

7.6.1 Including the frequency of communication

The final model adds in the frequency of communication. These models alter the variance explained considerably. Firstly, as shown in the bottom of the 'Model 3' column of Table 7.2, adding the frequency of communication significantly increases the overall explained variance. The R^2 increases from 0.14 to 0.22. However, when examining the level-1 and level-2 R^2 values, I find that the level-2 variance explained (R_2^2) has actually decreased, while the level-1 variance explained (R_1^2) has increased sixfold from 7 percent to 42 percent. A decrease in variance explained at one level is possible in these sorts of models (Gelman and Hill, 2007; Rabe-Hesketh and Skrondal, 2008). What this suggests is a third or more of the variance in how many media are used can be attributed to the frequency of use for the various media. This demonstrates a variant on the media multiplexity hypothesis that Wellman has termed 'the more, the more hypothesis'.[9] By this he means that the more people will contact by any medium the more they will contact by all media. This "the more, the more" hypothesis appears to be far stronger than the media multiplexity hypothesis about tie strength.

From an accessibility perspective this makes sense. Individuals will give the most access to those they communicate with most frequently. Of course there are exceptions (such as not giving one's boss one's instant message address). These are to be expected, especially considering these variables did not account for all of the variation within networks. Nevertheless, frequency of communication is a powerful force mo-

[9] Wellman, personal communication.

tivating one's decision to employ additional media with others. Also, "the more, the more" refers only to social activity, email, and instant messaging, each of which had positive coefficients. By contrast, telephone had a negative coefficient. After exploring this relationship further, it is clear that telephone contact is negative only when controlling for other frequency of contact variables, particularly socializing. That is to say, given a particular level of contact in person, the more one talks on the phone the less other media they are going to use together. This, perhaps, suggests a certain substitution effect between telephone and other media in specific cases. It can also be considered from an accessibility perspective. Very frequent telephone contact implies that it is easy to contact via telephone. With less telephone contact, ego might be either reluctant to "cold" call alter, or be just as interested in accessing them another way. I believe this particular finding calls for further inquiry.

An additional consequence of including the frequency of communication in these models is that it mutes the explanatory power of several of the previously significant variables, most notably, tie strength. Because there is a stronger relationship between frequency and number of media than between tie strength and number of media, and frequency is correlated with tie strength, this finding is unsurprising. The third model also masks the explanatory power of distance, degree, and kin status. Like tie strength, distance was also correlated with frequency of contact, especially in person contact. Also like tie strength, distance was not a particularly strong explanatory variable. The same explanation holds for kin status, as in person contact, socializing, and email contact were all lower for kin than non-kin.

Of all four variables that became non-significant in model 3, only degree was not correlated with frequency of contact. However, degree's standard error was still much lower than the other three. It is possible that under other conditions (such as a larger sample size) degree would still be significant.

7.7 Discussion

These four models (the variance components model plus the three shown in Table 7.2) have revealed copious micro-findings, many of which are aligned with the original hypotheses. Collectively, they seem to have made the media multiplexity hypothesis more complex, rather than less. That was partially the goal. As seen in the original model, the stronger the tie, the more media one is going to use with that person. This finding is statistically significant but not substantively significant. It explains nearly no variation in the overall model even though the coefficient has a p-value < 0.05. With the use of specific statistical controls that take into account some of the more obvious reasons why individuals would use more media-contexts, this relationship between tie strength and media use becomes more significant, but it is still not a particularly strong explanatory variable for the logic of media use *within personal networks*. Rather in this case, the theoretically constituent parts of tie strength—being spatially proximate, being in frequent contact, having many mutual relationships, and being a particular kind of tie—are more useful in predicting the number of media-contexts used. As mentioned above, tie strength is a multidimensional construct, and other measures are also relevant, such as length of time known, propensity to be reciprocal and extent of support given and received. Indeed, these are not taken into account. However, of the various correlates to tie strength espoused in the literature, the one's included above seem the most logical variables to include in this model. Moreover, neither supportive relations nor reciprocity significantly contributed to the model.

Finally, the goal here is not to completely undermine the relevance of tie strength to media multiplexity. It is to show that there are numerous practical attributes of a relationship and a network that are as important as tie strength, if not more so, for understanding media access.

7.8 Summarizing the hypotheses

Hypothesis 1 suggested there were role specific values for media multiplexity. There is no clear evidence for this to be the case outside of the broad distinction based on ascribed versus acquired ties, given the significant negative effects of being kin. These findings might be extended into more nuanced understandings of role in a larger data set. However, they may not. It might be the case that there is simply too much variance in how people interpret specific roles beyond the clear distinction of kin-non-kin. What a neighbour means for some is completely different than for others. Yet, there is a clear consistency in what it means to be kin (Wellman and Wortley, 1989; Fischer, 1982). As noted above, this consistency means that individuals will include kin in the network that they do not talk with particularly frequently or by many media.

Hypothesis 2 suggested that more highly connected individuals will share more media with ego. This finding is relevant both at the individual level (where degree is significant) and at the network level (where density is significant). This is a particularly strong and useful finding as it can be effectively applied to future media systems, such as who to include on Facebook, who to suggest for addresses in one's email list, or who to list on one's instant messenger chat list. It does not require complex network analysis, and has a face validity as a logic that can be employed by an individual. It also lends itself to a theory of social accessibility. Those who share the most ties with ego may also serve as gatekeepers for ego. If one is to use a number of media, it would be with these individuals. They may organize affairs, with each one having differential access to the rest of the network, but mutually having a great deal of coverage. However, just like tie strength, the significance of degree is washed out by the frequency of contact. Yet, even this reinforces the logic that individuals jointly organize and communicate. Those with whom they are in more frequent communication *are* those of higher degree.

Hypothesis 3 suggested that more spatially proximate individuals will share greater numbers of media with ego. This is a relatively commonsense claim when considering interaction patterns. Only the hype of the early days of the Internet worked against the idea that individuals would communicate in more ways with those who are distant. In early work and punditry one may build a claim that people would need to use an array of media to compensate for a lack of in-person contact among those who are more distant. Yet, by considering the Internet as embedded in everyday life, it starts to support the architecture of everyday actions. The vast majority of these actions are grounded in the coordination and mutual interaction of physically proximate individuals.

Hypothesis 4 suggested that those with more frequent in-person contact will share more media with ego. The evidence slightly supports this claim. The p-value is ever so slightly above the traditional cut-off of 0.05. Yet of all the frequency of interaction variables, in-person interaction was the least significant. This is probably because of all the means of interaction, in person contact (rather than socializing) is the form of contact least regulated by ego. As Boase (2006) notes, one's choice of interaction partners in person is highly variable. By contrast, one's choice of interaction partners by media can be more carefully controlled.

The finding helps to reinforce Haythornthwaite and Wellman's second claim of media use—that there is a Guttman scale of media use. A secondary analysis found some evidence for a partial Guttman scale. Using the `LoevH` algorithm for media use on the dichotomous variables use/did not use media, I found that evidence for a Guttman scale starting from in person contact, followed by socializing, email, and cell phone use. Landline telephone and instant message use could not be included in this scale, thus making it a partial rather than full Guttman scale of media use. The fact that telephone was not included could reasonably be expected from the earlier discussion about the telephone's relationship to tie strength and media use—namely

that in many ways it stands apart from other media.[10] Nevertheless, the point is that people start with in-person interaction first. After this point, individuals are more selective about those with whom they will interact.

Hypothesis 5 suggested that when controlling for these other effects, that the residual effects of socioemotional tie strength will not explain how many media-contexts individuals use with others. This hypothesis is true when including the frequency of communication. That is to say, the media multiplexity hypothesis is either spurious or under-specified. Since tie strength was significant in model 2 (such that someone on the fist ring will use, on average, 0.4 more media than someone on the outer ring), I cannot deny the explanatory power of tie strength outright. However, I do believe that in the case of everyday life communication, there are far better ways to explain the number of media used than socioemotional tie strength. As a consequence, I recommend researchers focus on the relevant and constituent aspects of tie strength, rather than merely taking tie strength for granted as a motivator of increased media use.

7.9 Conclusion

Of all the aspects of networking in everyday life, one might consider the number of media used to be a relatively marginal one. I would argue differently, especially in contemporary urban societies. Social access is one of the key ways in which individuals sustain their ties with each other. To say, "I am available whenever you need me" is a powerful statement. To merely have someone on your instant messenger list means they are available when you want to chat. To email someone is to denote that

[10] The `LoevH` algorithm calculates Lovinger's H, a measure of expected versus measured errors in a ranking of dichotomous variables (Loevinger, 1948; Hardouin, 2004). If there are significantly less errors than expected, the value is kept in the model. In the aforementioned scale, the scale Loevinger's H coefficient (rather than Loevinger's H for specific items) was 0.2799, which gives a very significant p-value of < 0.001. However, this scale should not be taken as the last word as it is a scale of the ordering of media used between dyads. Unlike the HLM models, this scale does not take into account how dyads are nested in networks.

you can discreetly plan future events, as well as trade all sorts of documents, from inspirational chain letters to family photos to party invitations. As actor Peter Ustinov mused over thirty years ago, "Contrary to general belief, I do not believe that friends are necessarily the people you like best, they are merely the people who get there first" (Ustinov, 1977).

While sociologists are frequently less than great at predicting the future, it is safe to assume that there are new media on the horizon. Since embarking on this dissertation, email and instant messaging have been partially usurped by social media (such as Facebook and MySpace) and "twittering" (the practice of broadcasting very short life updates). If we do not sort out the logic behind media multiplexity (be it role, communication frequency, degree or proximity), we will be faced with the seemingly perennial task of migrating tie our relationships from one medium to another. While the network-as-cognitive-object will likely remain intact, the actual means for contact these individuals will be partially strewn across ever more media.

This is the modern equivalent of Simmel's web of group affiliations. In Simmel's day, alters were generally associated with specific places and specific times. Some individuals were known through church, others through a fraternal organization and others still from work. Individuals, mused Simmel, expressed their identity through their specific combination of these groups. Yet, they were always existing at any given group at any given time.

Now, accessing individuals is simultaneously far more simple and far more complex. Simpler insofar as one need not travel, nor even be in contact at the same time. More complex as one does not have the same certainty of knowing when or where one's alters are available. But that does not imply social fabric is in free fall. As seen above, there are still obvious and theoretically driven logics to everyday life. But these are the logics of networks, not groups. The network metaphor which aptly described the web of connections in Simmel's day has become even more entrenched in our un-

derstanding of how to relate to others—for not even the simple task of deciding how to contact someone can escape its grip.

Chapter 8

Conclusion: Networking as accessibility

8.1 Introduction

This thesis began with the story of my day: a busy media-rich life of attending to the various ways I know others. My experience is not a universal one, nor is my technique an obvious one. As I have demonstrated in Chapter 5, one should not expect a universal strategy of using many media in concert; people vary both in which media they use and the intensity of their use. Yet, one can look across myriad strategies towards general tendencies and overall logics that can inform the behaviour: both of those who frequently use many media and those who use few.

More specifically, I have examined media use with particular individuals, either as dyads or as part of larger social structures. Media are not solitary toys, they are artifacts of our present social system and an integral part of how we maintain social cohesion—they cut across specific social settings and are a part of the arrangement of everyday life. Even activities as seemingly cavalier as dropping into someone's house are affected and sustained through their use. People will now call a few minutes ahead of time, look up specific locations on mobile maps or anticipate and check for potential changes of plans.

The sociological question in this situation is not a mere profiling of media use, but how media literally mediate the relationship between (1) those whom individuals consider as members of their personal network and (2) those with whom individuals

contact and actively sustain relationships (i.e., who one feels close to and who one ultimately associates with). After having examined this relationship at various levels of analysis, I offer the following story.

- **Media present cues for action that cut across offline contexts**. Media do not simply transmit our voices or text, but present a specific series of cues about who, where, and when individuals are communicating with each other (Chapter 2). These cues are termed social affordances. As affordances they link objective social conditions and internal states. Affordances are what we perceive from the environment we inhabit. This includes the environment of media that are used to communicate and coordinate. For example, instant messenger presents a person's status, email indicates specific addressees, and cell phones list the most recent callers.

- **Individuals make differential use of these cues and are differentially accessible.** Differential use of these media give individuals differential access to others in one's network (as seen in the clusters in Chapter 5). Some individuals are apt to only plan using the telephone, while others use a bevy of media. Some people eschew media (such as respondents who simply "do not like" email or instant messaging). Several quotes throughout the dissertation illustrated this. It is also found through studies of Internet drop-outs (Rice and Katz, 2003). This means they are not available in certain ways, and cannot take advantage of the affordances that come along with said media.

- **These differences appear to be more closely related to individual propensities rather than social location.** The social location analysis in Chapter 5 indicated that media use styles were only approximately related to certain characteristics. For example, younger individuals tended to use more media, but it was not unambiguous. Coupled individuals tended to plan less overall, but again it was not

unambiguous. Rather, it would seem that individuals have a particular propensity to plan which is more directly related to the activities they engage in than their social location. And both activities and media use seem to correlate well with overall frequency of planning.

- **Differences in media use do not mean structural differences.** This point was noted in a number of different places. In particular:

  - **Heavy planners generally have very large networks, but there is not such a clear relationship between size and media use among not-"heavy planners".** As seen in Chapter 5, the media omnivore group listed very large personal networks (often in excess of ninety individuals) whereas the remaining individuals (who made up most of the sample) had network sizes of about 34 whether they planned very infrequently, or somewhat frequently by a single media/in person.

  - **There is little correlation between overall structure and overall media variation.** In Chapter 6 I calculated the overall variability of interaction with one's network as a particularity score. This score was strongly related to several variables, such as how frequently an individual plans, whether or not they were heavy Internet users and whether or not they were immigrants. However, it was not related to the number of individuals occupying specific roles or to standard structural metrics such as density, size, number of components or average degree. Granted, it was somewhat related to the number of isolates, but this is probably spurious, since this finding was no longer significant when I included the number of online-only alters (who are primarily isolates).

  - **However, there are correlations between individual media use variations and individual structural position.** So I cannot say there is no relationship

> between social networks and media use, of course there is. However, it is not in the form predicted by networked individualism...that more fine-tuned person-to-person contact is associated with more sparse and fragmented networks. Rather the relationship works on the dyadic level as seen in Chapter 7. At this level, specific individuals who are of higher degree and in more dense networks will use greater numbers of media with ego. Also, individuals who are family tend to share less media with ego, while those who use frequent media (other than the telephone) tend to use more media with ego.

- **Roles are filtered through biases such as group structure and recency of contact.** Roles do not play a large part in variations in media use, yet they play a large part in understanding the structure of the personal network. This is seen in qualitative narratives, sociograms and the analysis of the group-like structure (or perhaps homophily) of ties by role in Chapter 6. That they order the network is only partially because this is what the network "really looks like". Rather some roles benefit from cognitive biases such as how individuals categorize alters based on groups and how individuals recall alters based on whether or not they have been in recent contact.

- **Tie strength is not strongly coupled with differences in media accessibility.** This was found in Chapter 7 where I tested the media multiplexity hypothesis. It was shown that indeed, tie strength was significant, but only in the first model. By adding any other variables, such as controls for age, frequency of contact or network structure, this relationship quickly became non-significant. Also, even when it was significant, tie strength explained less than one percent of the variance in the number of media used. Given that it has been significant using different approaches in different contexts, I suggest that this is due to the differ-

ential accessibility of alters. Alters in prior studies, such as Haythornthwaite and Wellman's distance learner study (1998) all had access to similar equipment and a host of student-centered media, plus they were relatively homogeneous demographically. By contrast, everyday life involves maintaining ties with a host of diverse individuals, each with their own penchant for media use and different reasons for wanting to maintain a relationship with ego.

- **Social accessibility is tied to Media accessibility, but not tie strength**. This is as much a theoretical claim as an evidentiary one. Tie strength did not explain media multiplexity in Chapter 7, but it was reasonably well explained by an individual's distance, their location in the network, whether or not they were family as well as how frequently they were in contact.

- **This creates a conundrum—individuals do not necessarily use diverse media with their most strongly tied alters, but their most accessible ones. But if media make some people more accessible by virtue of their personal propensity to plan as well as their structural position, then media may in fact exacerbate the difference between tie strength and social accessibility, rather than help it.** The rest of this chapter will grapple with this conundrum at length.

At all three levels (individual, dyad and network) I have focused on how respondents relate to their alters, either through social activities, specific roles or frequency and type of contact. The general answer to this question, as distributed throughout the analysis, is that there is a discord between who individuals think about in their network and who they engage with. Here I do not suggest that the Internet causes people to act in a particular way, but that people have general needs to maintain access with sets of alters (most notably the personal network, but also one's work network, etc...), and that they are prone to differential levels of planning and have a different tastes for new media. So, it is just as likely that media omnivores were actively connecting

large swaths of people before the net.[1] Yet the playing field has changed since these new media are not simply used among heavy users, but among the entire population. So while the behaviours may stay consistent, they may still have effects on one's accessibility. Given the differences in accessibility, it follows empirically that strongly tied alters are not always the most accessible alters. People are accessible for a host of reasons—frequent contact, mutual ties, or preference for a similar kind of social activity / media. And I know both from this analysis and pre-existing literature that ties are close for a host of reasons, such as personal history, reciprocity, frequent contact, and social support (Marsden and Campbell, 1984; Wellman, 1988).

8.2 New media and anomie

In broader terms, this work recasts the debate about the impact of technology on social isolation into a debate about technology's capacity to attenuate or foster social anomie.

As a concept, anomie is as old as sociology and it is closely tied to sociology as a study of modernity (Giddens, 1973). While not the inventor of the phrase, Durkheim is the first sociologist to use it with any zeal. Even though Durkheim had considered anomie in relation to the division of labour (read: work), if one replaces "media" with "labour", the parallels are striking:

> This agreement on necessary procedures and rules grows out of prolonged contact and interaction, and in turn gives stability to complementary relationships. Without such pre-established "rules of conduct," interaction must procede [sic] on a trial-and-error basis, which often results in conflict, not solidarity. Anomic division of labor exists whenever "this regulation either does not exist, or is not in accord with the degree of development of

[1] Anderson (2008) recently found similar evidence in an analysis of broadband users. Using a longitudinal panel design, he found that differences in behaviour after the introduction of high-speed Internet was primarily associated with previous media habits. He concluded that there was little effect of the introduction of this technology that could not be explained by consistent media use behaviours.

> the division of labor" (Olsen, 1965, 39, quoting Durkheim).

and

> Anomie is especially likely "when society is disturbed by some painful crisis or by beneficent but abrupt transitions," so that the system of moral norms temporarily breaks down. "The scale is upset; but a new scale cannot be immediately improvised." He saw this condition as particularly common following rapid technological change, and in the realm of trade and industry (Olsen, 1965, 41, quoting Durkheim).

The idea of an anomie of media has been posited briefly before by Star and colleagues at the University of Illinois, Urbana-Champaign (Star, Bowker, and Neumann, 1997). They discuss it as "information anomie" whilst referring to a lack of convergence in information objects. In that context, it meant how new media objects increase information scatter in libraries. With the digital revolution, information could be found in any number of places including disparate databases, clippings, mailboxes, racks, stacks, and so forth. In the decade since the publication of that article digital searching and interoperability standards have improved dramatically. However, in the case of social new media, there is no equivalent to search and interoperability (except perhaps a personal assistant). There is still "social scatter" as individuals are left to handle the variety of communication streams from email, instant messaging, cell phone message manager, texts, and so forth. Convergence is emerging, to some extent, with new media devices such as the iPhone (which is both a cell phone and a capable personal computer with extra affordances to boot). Yet, even convergence is not the solution: many respondents have email but do not check it frequently, nor are they interested in instant messaging. Having an iPhone will simply enable people to *not* do these things in more places and at more times. And even if it does allow greater

mobility of new media, it will only exacerbate the anomic situation by enabling ever more differentiated use of media.

Durkheim originally referred to anomie when discussing a shift from mechanical solidarity to organic solidarity. The former referred to social cohesion based on broadly encompassing similarities and ritual among individuals, while the latter referred to cohesion based individual specialized relationships common in modern society. A hundred years later, the shift from mechanical to organic solidarity is happening again, but in the domain of "points of contact" (read: media) rather than occupations. Maybe instead of suggesting that media users are differently social, one might say that people are now "differentiatedly" social.

Consider that if a person has a device that can be used in 90 percent of populated spaces at any time with at least nine different "media" each with their own distinct affordances then perhaps socially negotiated norms and behaviour patterns are the only possible "constants" left.[2] I know of network members who are very active on all of these systems, with only some overlap between who is most active on one and who is most active on the other. In light of this situation, suggesting such technology is an isolating force is almost foolhardy. But to suggest that it has not changed how people network, or that it simply "integrates" into everyday life is nearly as naïve.

At present, the academic debate about social isolation has been mostly settled—social media do not push people away from each other, but are embedded in everyday life. The social isolation debate began in the utopian/dystopian punditry of the Internet boom nineties. The first major negative piece was Kraut et al.'s earliest HomeNet study that showed a relationship between alienation and Internet use (1998). Subsequent HomeNet work suggests this finding was as much a matter of historical contingency as it was due to the Internet in general (Kraut, Kiesler, Boneva, Cummings,

[2]Presently, my spouse's iPhone can handle cell voice, cell text, cell answering machine, email, instant messaging, and dedicated applications for Twitter, blogging, Facebook, and online sharing of geographically tagged photos.

Helgeson, and Crawford, 2001). An excellent inversion of HomeNet is Hampton and Wellman's Netville study showing how neighbours in a semi-wired suburb were more sociable if they had high-speed Internet than if they did not (Hampton and Wellman, 2003). Again follow up analysis revealed it was a historical contingency derived from the conditions of the natural experiment (where two-thirds of the homes were wired) as much as factors related to the Internet in general (Hampton, 2007; Arnold, Gibbs, and Wright, 2003).

Other studies have followed in this utopian/dystopian framework using a host of methods, and almost unequivocally positioning their work in relation to the potential for social isolation. From time-use data (Robinson, 2002; Nie, Hillygus, and Erbring, 2002), panel surveys (Katz and Rice, 2003), national samples (Veenhof, 2006), and network approaches (Boase et al., 2006; Wellman et al., 2006), most scholars have found that Internet users are perhaps differently social rather than less social or even asocial. For example, Katz and Rice (2002) show that Internet users appear to access more non-local ties, and less local ones. Robinson et al. (2002) show that individuals seem to cut back most on asocial television watching in order to make up for time on the Internet. Veenhof (2006) shows that Internet users seem to spend slightly less time with family, while still enjoying similar levels of social contact overall. In general, differently social is a stronger claim than less social.

Accessing these alters may become more problematic as people tend towards specific and customized approaches to the use of which medium and when—towards being "differently social". But this problematic issue does not lead to social isolation as many scholars have posited and then discredited—for a further review see Shklovski et al. (2006). Considering normlessness rather than isolation may help explain the disconnect between McPherson et al.'s claim that the ties that bind are presently fraying (based on an analysis of who people discuss important matters with McPherson et al., 2006) and Boase et al.'s claim that new media such as email are particularly useful for

weak ties and heavy email users seem to have more ties rather than fewer (Boase et al., 2006).

McPherson and colleagues used "discuss important matters" as a datum for network size, despite issues that important matters are ill-defined (Bearman and Parigi, 2004) and that those people who ask no one are not, as one might contend, actually socially isolated. By contrast, Boase used a more encompassing measure of "closeness", but as in this study, closeness suffers from biases, as do the instruments (Hogan et al., 2007).

On McPherson et al.'s side are also scholars such as Putnam, who bemoan the decline of voluntary associations while implicitly assuming they are the true sources of social capital and civic engagement (Putnam, 2000). On Boase's side are scholars such as Ellison et al. who show that individuals are using social media sites to harness social capital in effective and highly efficient ways (Ellison, Steinfeld, and Lampe, 2007). New media are not causing individuals to become more isolated, although they are changing the rules for how people maintain contact. They are fragmenting our sense of the best way to access people, rather than interfering with our ability to access people in general.

Harmonizing all these analyses with the findings herein, one might say that many people are more accessible than ever (at least objectively), but it is quite a trying task to access the right people at the right time in the right way. Thus, we may simply interact with those who are more accessible, with whom we may not be interested in discussing important matters. (To be cheeky, why discuss important matters anyway, when any answer is just a Google click away?) Yet these individuals may be excellent sources of social capital more generally, especially if they come from diverse backgrounds or different parts of one's social network (Erickson, 1996, 2003).

I believe that a focus on anomie may give a fresh start to the analysis of the social effects of the Internet. That is, instead of focusing on the cognitive social network

(the personal network) which always appears in surveys and interviews as a solid and all-too-reified object, we focus on the process of maintaining relationships first, and the structure of said relationships second. That is, it is not the *ends* that have seen the predicted dramatic shift, but the *means*. Then we can ask—is maintaining ties getting more complicated? Is the current media environment simply too individually governed? How can we make best use of new media in order to preserve the beneficial affordances without dealing with unnecessary complexity and a further erosion of cohesive social norms such as public and private time (or what can we put in their place other than specific person-by-person instructions like "he is accessible by email all evening, but do not call after 10pm" or "when she says she is busy in instant messenger, it really means she does not want a random conversation, but she will let me talk to her", c.f., Quan-Hasse and Collins, 2008)?

8.3 Limitations and caveats

Before ending, I want to offer some caveats and limitations of this story. This work is limited in scope even if it's ambitious in theory. And hopefully, this situation will have opened up new research questions as well as answering some older ones.

The most important caveat is in the research site itself. East York is not the world, nor is it even a fair representation of the city. It is ethnically diverse, but it is still merely the east side of a city, between the suburbs and the downtown core. As Michelson (1977) reports, the social activity patterns for individuals from the suburbs are markedly different from the downtown core. Individuals have to travel further to meet in person in the suburbs, but this is often compensated by pleasant surroundings, open yards and less bustle. Additionally, media are employed differently in different countries whether we refer to mobile email and web on cell phones in Japan (Miyata, Boase, Wellman, and Ikeda, 2005), cell phone texting in Europe (Castells et al., 2006), or simply the different sorts of social media sites used globally (boyd and Elli-

son, 2007).

However, these are specific media, whereas this has been a pan media exercise. Previous pan media work such as Kim et al. (2007) have shown patterns that would be entirely in tune with this work, even if they approach the analysis from a slightly different angle (that of coupling by role, rather than activity). In both cases, one can still interpret the use of multiple media in concert as an exercise in regulating and fostering accessibility.

The second caveat is in the sort of inferential connections made herein. As mentioned in Chapter 5, I can report on rates of media use for planning, and frequencies of certain social activities, but not rates of media for planning specific activities. So while those who drop-in daily might be frequently planning with their alters, they might actually be planning something entirely different and unmeasured (although it is not likely). Similarly, the analysis of group structure and social contact implies that individuals will be recalled either if they are frequently contacted or part of a perceptual structure. This assumes that others are not recalled. It makes sense, although there is room to do a more effective analysis of this claim by comparing the sociocognitive network to the network as exists in behavioral studies.

A third caveat is the conceptual leap that individuals actually *want* to network with their most strongly tied alters. I do not think that this is a guarantee, as close ties might provide redundant information (hence the strength of weak ties; Granovetter, 1973), or entail unwanted social obligations (Portes, 1998; Uehara, 1990). However, I still believe this is a safe assumption. Also, despite the fact that I undermined Haythornthwaite's media multiplexity theory in everyday life, I think her findings offer a persuasive case that individuals *do* want to network with their closer ties all else being equal. In homogenous contexts where individuals have similar access to all their ties, it seems that individuals do, in fact, network with others with whom they feel closer (Haythornthwaite and Wellman, 1998).

This points to a potential for further study of this issue combining a number of methods ranging from time-use data and network name generators to thick descriptions of networking processes as people decide *in situ* which media to use and when. I believe several questions posed herein could easily be expanded:

1. *What sort of discrepancies exist between a person's expectations of a new social medium before adoption and their expectations for this medium after a period of habitual use?* Based on the arguments herein, we should expect people to adopt based on an expectation that it will bridge gaps with more closely tied alters, but that they eventually will use it with those who are simply the most frequent or accessible.
2. *Does the relationship between planning and ad hoc activities persist in more geographically contained places?* Based on the arguments herein, media use unsettles previous normative expectations for behavior settings. Places where people would rarely call ahead before arriving will now do so after wholesale adoption of new media. This process should not be sensitive to the geography of the space.
3. *Will prolonged use of multiple media eventually lead to media-specific triadic closure rather than role-specific closure?* In order to harmonize one's understanding of who is accessible by what media with one's appreciation of who is close, will individuals increasingly close gaps on specific media rather than in person? Thus, individuals may link together disparate friends on Facebook or instant messaging simply because both are active at the same time? Or will the personalization of these media lead to ever more fragmentation of access and contact?

8.4 A shift in networking, or new tools for old needs?

One outstanding "big-picture" question about this work is whether it speaks to a larger social shift in the way individuals network, or merely elaborates on pre-existing processes. I suspect that there is indeed a larger social shift happening, and that it is

not entirely clear what its consequences are going to be. This is the shift towards more diversified and partial forms of networking based on differential access between network members. That is, people will continually fine tune their networking habits to include a hodgepodge of telephone contact, cell, email, instant messenger, social software, and blogging. But people do not engage in these activities with the same gusto. It is very difficult for me to ignore a knock at my door, but it is easy to not log into Facebook for a few weeks or on to my instant messenger client for as much time. I assume that others feel similarly, as there are wide variations in the patterns of online communication, even for those who are connected to the Internet. This makes life more complex, even as it makes social activities more specific and personally refined.

Wellman has already discussed this shift via his theory of networked individualism (Wellman, 2002). Therein, he assumes that a shift in how people network (using partial coverage of multiple media) will likely be associated with a shift in network structure. Thus far, I did not find evidence of a relationship between fragmented networks and particular networking strategies. There is probably fragmentation on a per-media basis, with some alters being most accessible by cell phone, others by email and so forth, but individuals still consider their network in terms of cohesive groups, roles, reciprocal relations and so forth. Moreover, there is probably a threshold to how fragmented a network can get or will get. Only in the most abstract and dyadic world could one envision a population whose members have network connections that are totally sparse. Triadic closure is not a medium or historically specific phenomenon but a general aspect of how individuals conceive of their ties. The same can be said for many of the cognitive biases inherent in network recall. What has perhaps changed about network structure as a consequence is the polarization of network size and responsibility for network management. As I indicated in chapter 5, one small group with much media use had by far the largest networks, and significantly so. For them, networking by many media had substantial benefits in terms of network size. But for

the rest there was little evidence that networks varied by networking.

Perhaps a more parsimonious way to talk about this shift is to couch it in terms of access, rather than networks. In such a case, it is a shift from access based on spatiotemporal regularities towards media-specific access. If one is not persuaded by the data thus far, perhaps a final personal anecdote will suffice.

My father comes from a large Irish Catholic family. He has six siblings, and a widowed mother. The mother as well as four of the siblings still live in my hometown. On many nights of the week, Dad will leave after supper and drop-in to most of his kin in town. The door is usually open, and he'll simply call out to find out if anyone is home. If not, he'll move on to the next house, usually ending at my Grandmother's place. I had my father's networking in mind when I included "dropping in" in the social activity questions that were used in chapter 5. It is spatiotemporal—he'll drop-in during the evenings to fixed places from a reasonably well defined set of relations. My father does little planning, calling ahead or checking. And from what I understand of other visitors in rural Newfoundland, this is the norm rather than the exception. However, in this survey, those people who did the most dropping in were, by contrast, the most heavy planners. They would use a diversity of media to continually renegotiate their dropping in, or hanging out. Networking in Toronto does not permit such easy access across alters. No doubt, part of this is because of the geographic size. However, that is only part of the explanation. Here dropping in appears to take on a different character. People plan ad hoc, rather than assume permeable social boundaries and just drop-in unannounced. It is a shift from maintaining ties based on rhythmic patterns (and accessibility using spatial boundaries and temporal norms) towards maintaining ties based on who one can get ahold of through various media.

Within this shift in networking towards access, one can see the relevance of social affordances. Access is understood through affordances. Whether it is the list of people available on instant messenger, the numbers stored in one's phone address book, the

people one can easily find at a regular meeting or the list of alters on a social media site like Facebook, affordances guide access. An affordance of asynchronous interaction permits access at any time whereas the affordance of a buddy list is a cue to who is available for conversation at any given time, regardless of place. Yet, these social affordances are often based on the intuitions of media designers, or even planners, coupled with the contingencies of history rather than the cognitive biases of individuals. An unlocked back door in a rural town affords "come on in, our door is [literally] open". But there are subtle norms at play about when people will show up, when they leave and how frequently they visit. Simply because the door is unlocked does not mean anyone can stroll in without good reason, nor can people do it at any time (Zerubavel, 1985; Melbin, 1987). The unlocked door does not give the same sort of cues about when is a good time to access others—that is managed through larger cultural norms of dropping in. By contrast, new media clearly articulate the affordances of access—by responding to messages promptly, or reading a person's status message one is given contingent and often personalized perceptual cues of availability. For example, it is not important that I am home, or that it is in the evening: if I am on instant messenger and I say I am available, then I am available. This shift implies a change from culturally understood norms of public and private time and space, as per Zerubavel's original conception of social accessibility (1979) to dyadically negotiated per-media combinations leveraging specific social affordances from software and individual styles.

It is not an entirely welcome shift, as individual negotiations are often mediated by power. For example, bosses can now individually negotiate work hours with subordinates, encouraging email use on off hours or cell phone access regardless of place (Middleton and Cukier, 2006; Hogan and Fisher, 2006; Salaff, 2002; Perlow, 1998). Users of the Blackberry (a mobile email, web, and cellular device) appear perpetually distracted by incoming messages, whether they are at a party or a funeral. Individ-

uals can also hold non-regular hours, believing that the people who need get ahold of them will know how to do so, regardless of the time (when in fact that is not always the case). In their study of mobile phone adoption, Sarker and Wells eloquently pointed to this issue. "Interestingly, users of mobile devices experienced a simultaneous sense of freedom from being bound to their desks with a tethered device, yet, at the same time, a sense of captivity" (2003, 36). This quote captures the inherent contradiction of a shift to networking based on access. What the users felt was not liberation nor oppression—it was a yet unnamed shift in thinking about how to regulate personal boundaries and manage ties. I would name this shift as a transition from spatiotemporal networking to networking based on access. And the resulting anomie (considered as captivity in the quote above) is based on a shift from maintaining ties with one's closest ties in specific spatiotemporally bounded behaviour settings to networking with one's most accessible alters regardless of spatiotemporal boundaries.

Yet, one may argue that these drawbacks are themselves a technological, rather than a social, failing. It is possible that with better affordances such as "contextual-awareness" (Bolchini et al., 2007; Schilit, Adams, and Want, 1994), the media themselves will provide additional cues. Such cues should enable people to have the benefit of individually negotiated interactions (bridging the gap between the more strongly tied individuals and the more accessible ones) without reverting to broad cultural norms of spatiotemporal regularity.

If one believes that networking should be about facilitating interaction with those with whom we share the strongest bonds, then this can be taken as a design challenge for new media entrepreneurs. For example, SNARF, a project from Microsoft Research, sought to reorganize mail according to social network metrics (Fisher, Brush, Hogan, Smith, and Jacobs, 2007). Facebook is presently experimenting with how it can fine-tune social networking with gradated forms of access by closeness, and Google's mail client intelligently lists addresses to help with auto-complete features.

In all cases, these products are creating a "next-generation" style of online interaction that seeks to bridge the gap between who is accessible (by virtue of being at the top of a list, or included in a series of messages) and who an individual wants to access (by virtue of being a strong or significant tie). However, these products still have a long ways to go, if this analysis is any measure. Most importantly, they are still at the social network-on-one-medium level, whereas one can observe from this work that networks are pan media. Most people use multiple media with their network, or at the very least one medium in addition to in person contact. Groups that may exist in one medium may not exist in another, or may only be partially formed by looking at the connections in a given media. Also, individuals who are more spatially proximate seem to benefit differentially from multiple media access and those who are embedded in the overall network also seem to be given multiple media access.

That this may be a technological failing is not necessarily a bad thing. In fact, it suggests that research on how individuals conceive of their networks, act upon them and regulate access in myriad sociohistorical contexts can be leveraged in the design of smarter technologies. This is a practical and hasty role for sociologists in the creation of new media devices and interoperability between existing ones. While sociologists are not the designers of these systems, we need not exclusively look on as detached critics. In between these two poles of engaged designer and disengaged critic is a place for a sociologically informed analysis of networking that can identify differential access and pressure points. By using a language of affordances and access it is possible that we can translate these pressure points and the gap between closeness and accessibility into an operational language for next generation systems. At the very least, we can diagnose the anomie, articulate the contradictions and hope that the others will take up where we leave off with ever more parsimonious ways to network in everyday life.

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Appendix A

Connected Lives Survey

Dear Participant,

To make answering our survey a more pleasurable experience for you, we offer you a "road map" of our survey and some useful tips for filling it out.

First of all, there are no right or wrong answers to our questions. We are interested in your personal opinions.

When answering our questions, please select answers based on your own experiences. If you do not find an answer that completely meets your experiences or opinions, please check the answer closest to it.

If your first language is not English, you might want to use the help of somebody else in putting down your answers. If you use somebody else's help, please remember that we are interested in your personal opinions and experiences, and not those of the person helping you.

As you fill out the survey, you will see little symbols to help you. Each question will also have brief instructions.

CHECKBOX: If you see some circles ○1 ☑2 ○3 please check One: ○2
(The little number next to the box is for technical reasons.)

SQUARE CHECKBOX: ☑1 ☐2 ☑3 Same as above, except you can check all that apply.

FILL-IN (1): If you see a _____ please fill in a value: **15**

FILL-IN (2): If you see [ ] then please fill in a value: [**Parent**]

QUESTION: ? means the start of a new question

GO TO : ☞ means you might go to a new section, for example:

○1 Yes
○2 No ☞ *If you answered* NO, *please* SKIP *the rest of this page and go to* PAGE 5

NOT APPLICABLE: Some questions may not apply to you. If possible, select the "not applicable" box instead of skipping the question.

MISTAKES: If you make a mistake, simply cross out the wrong answer and write/check the right answer.
For example: ☒1 Unsure ○2 No ☑3 Yes

TAKE YOUR TIME AND ENJOY

Section 1 - About You

1.1 What is your gender?
[*Please check* ONE *answer*]
○1 Male
○2 Female

1.2 What year were you born? [*Please write the* YEAR] 19___

1.3 What is your highest completed level of school?
[*Please check* ONE *answer*]
○1 Less than high school diploma
○2 High school diploma or G.E.D.
○3 College or technical school diploma
○4 Some university
○5 Undergraduate university degree
○6 Advanced university degree (such as Ph.D., Masters, law degree, medical degree)

1.4 Are you currently a student?
[*Please check* ONE *answer*]
○1 No
○2 Yes - full time
○3 Yes - part time

1.5 In what year did you begin living at your current address?
○0 Always lived at this address, or...
[*Please write the* YEAR] 19___ or 20___

1.6 In what year did you begin living in the Greater Toronto Area (G.T.A.)?
○0 Always lived in the Greater Toronto Area (G.T.A.), or...
[*Please write the* YEAR] 19___ or 20___

1.7 Which of the following do you live in?
○1 House (detached, semi-detached or town house)
○2 Apartment building, less than 5 floors
○3 Apartment building, 5 or more floors
○4 Other _____

When you need to find <u>telephone numbers</u>, how often do you use the following?

[*Please check* ONE *per row*]

		Daily	Weekly	Monthly	Less than monthly	I don't use this
1.8	The phone book	○1	○2	○3	○4	○7
1.9	An address book on my computer	○1	○2	○3	○4	○7
1.10	A personal address book (paper) or a 'Rolodex'	○1	○2	○3	○4	○7
1.11	"Post-Its" / scraps of paper / my hand	○1	○2	○3	○4	○7
1.12	A portable device like a Blackberry or Palm PDA	○1	○2	○3	○4	○7
1.13	Numbers saved on my phone	○1	○2	○3	○4	○7
1.14	Asking someone else who might know	○1	○2	○3	○4	○7
1.15	Searching the Internet	○1	○2	○3	○4	○7
1.16	My memory	○1	○2	○3	○4	○7
1.17	Other _____(1.17a)	○1	○2	○3	○4	○7

To <u>remember occasions or plan your day</u>, how often do you use the following?

[*Please check* ONE *per row*]

		Daily	Weekly	Monthly	Less than monthly	I don't use this
1.18	Wall calendar in my home	○1	○2	○3	○4	○7
1.19	A "day timer" or agenda	○1	○2	○3	○4	○7
1.20	A portable device like a Blackberry or Palm PDA	○1	○2	○3	○4	○7
1.21	A pocket or wallet calendar	○1	○2	○3	○4	○7
1.22	My memory	○1	○2	○3	○4	○7
1.23	"Post-its" / scraps of paper / my hand	○1	○2	○3	○4	○7
1.24	A computer program	○1	○2	○3	○4	○7
1.25	My assistant	○1	○2	○3	○4	○7
1.26	Reminders from others	○1	○2	○3	○4	○7
1.27	Other _____(1.27a)	○1	○2	○3	○4	○7

SECTION 2 - YOUR COMPUTER USE

2.1 Do you currently have a computer in your home?

○1 Yes
○2 No ☞

If you answered NO, *please* SKIP *the rest of this page and go to* PAGE 7

2.* Who maintains your home computer day-to-day?
[*Please check* ALL *that apply*]

I do		☐2
My spouse / partner		☐3
	Male	Female
Child(ren)	☐4	☐5
Friends	☐6	☐7
Relatives	☐8	☐9
Neighbours	☐10	☐11
Technician	☐12	☐13
Other _____(2.15a)	☐14	☐15

Please tell us about your computer skills...
[*Please check only* ONE *per row*]

		Easily	With some difficulty	With help from someone I know	With help from a technician	I don't know what you mean by this
2.16	Using a word processor (such as Microsoft Word, WordPerfect, Wordpad)	○1	○2	○3	○4	○7
2.17	Using an Internet browser (such as Internet Explorer, Netscape)	○1	○2	○3	○4	○7
2.18	Downloading a file (music, picture, story) from the Internet	○1	○2	○3	○4	○7
2.19	Installing a program	○1	○2	○3	○4	○7
2.20	Protecting my computer against viruses	○1	○2	○3	○4	○7
2.21	Upgrading my operating system (for example, from Windows 98 to XP)	○1	○2	○3	○4	○7
2.22	Installing a home network	○1	○2	○3	○4	○7

Section 3: Your Internet Use

In this survey, INTERNET *refers to all online activities, such as email, instant messaging, surfing the web / using Internet Explorer, chat rooms, etc...*

3.1 Have you ever used the Internet? [*Please check* ONE *answer*]

○1 Yes
○2 No ☞

If answered NO, please SKIP *the rest of this page and go to* PAGE 10

3.2 What was the first year you used the Internet?
[✎ *Please write the* YEAR] 19___ or 20___

3.3 Do you currently have Internet access at home? [*Please check* ONE *answer*]

○1 No
○2 Yes →

3.4 How do you connect to the Internet from home?
○1 Dial-up access (ties up the phone line)
○2 High speed (Such as Rogers Hi-Speed or Bell Sympatico High Speed)
○3 Other: ✎ _____(3.4a)

3.5 Do you have a home network (i.e. more than one computer can be online at the same time)?
○1 Yes ○2 No ○9 Not Applicable (One computer in my house OR no Internet at home)

How often do you go on the Internet from home and work/school ?
[*Please check only* ONE *per row*]

		Never	Less than monthly	About Monthly	About Weekly	About Daily	All Day
3.6	Home	○1	○2	○3	○4	○5	○6
3.7	Work / school	○1	○2	○3	○4	○5	○6

What <u>times of day</u> do you use the Internet from home and work/school?
[*Please check* **ALL** *that apply*]

		Early morning 5-8am	Morning 8am-Noon	Afternoon Noon-6pm	Evening 6-11pm	Late night 11pm-5am	Not applicable
3.8	Home	□1	□2	□3	□4	□5	□9
3.9	Work/school	□1	□2	□3	□4	□5	□9

3.10a,b For each of home and work/school, please underline the square for when you <u>use the Internet the most</u>.

During a typical week, about how many hours do you actively use the Internet from home, and from work/school?

[*Please write the* NUMBER *of hours per week on EVERY line that applies*]
[*If you are not working and not in school, please check* "Not applicable", *and fill out for home only.*]

		# of hours ➔	Home	Work / school ○99 Not applicable
3.11-2	Overall Internet use		#_____	#_____
3.13-4	For work/ school		#_____	#_____
3.15-6	For general information		#_____	#_____
3.17-8	Finding product information or shopping		#_____	#_____
3.19-20	For health information		#_____	#____
3.21-2	Communicating with others		#_____	#_____

In general, how much has the Internet affected the following?

[*Please check only* ONE *per row*]

		Made it much more difficult	Made it somewhat more difficult	Has not affected it	Made it somewhat easier	Made it much easier	Don't use the Internet for this
3.23	Getting health care information	○1	○2	○3	○4	○5	○7
3.24	Shopping	○1	○2	○3	○4	○5	○7
3.25	Managing money	○1	○2	○3	○4	○5	○7
3.26	Connecting with household members	○1	○2	○3	○4	○5	○7
3.27	Connecting with relatives	○1	○2	○3	○4	○5	○7
3.28	Connecting with friends	○1	○2	○3	○4	○5	○7
3.29	Meeting new people	○1	○2	○3	○4	○5	○7
3.30	Learning about new things	○1	○2	○3	○4	○5	○7
3.31	The way you work	○0	○1	○2	○3	○4	○7

3.32 How much would you miss going on the Internet, if you could no longer do so?

○1 Very much
○2 Somewhat
○3 Very little
○4 Not at all

3.33 How many email accounts do you have that you use regularly? [*Please check* ONE]

○0 ○1 ○2 ○3 ○4 ○5 or more

During a typical week, <u>how many emails</u> do you send from home, and from work/school?

[*Please write the* NUMBER *of emails on EVERY line*]

[*Not working and not in school, please check* "Not applicable"*, and fill out for home only*.]

	# of emails: ➔	Home	Work / School ○99 Not applicable
3.34,35	To household members	#_____	#_____
3.36,37	To relatives	#_____	#_____
3.38,39	To friends	#_____	#_____
3.40,41	Work / school related	#_____	#_____

When you need to find <u>email addresses,</u> how often do you use the following?

[*Please check* ONE *per row*]

		Daily	Weekly	Monthly	Less than monthly	I don't use this
3.42	Email program automatically completes addresses	○1	○2	○3	○4	○7
3.43	A personal address book (paper) or a 'Rolodex'	○1	○2	○3	○4	○7
3.44	Search address book on my computer	○1	○2	○3	○4	○7
3.45	Address book on my Blackberry or PDA	○1	○2	○3	○4	○7
3.46	My memory	○1	○2	○3	○4	○7
3.47	Use address from an existing message	○1	○2	○3	○4	○7
3.48	Ask someone else who might know	○1	○2	○3	○4	○7
3.49	"Post-its" / scraps of paper / my hand	○1	○2	○3	○4	○7
3.50	Search for address on the Internet	○1	○2	○3	○4	○7

3.51-53 Have you ever used the Internet to communicate about <u>physical health or mental health</u>?

[*Please check* ALL *that apply*]

With a doctor or other health care professional No □1 Yes □2

With friends or family members No □1 Yes □2

With other people with similar health care issues No □1 Yes □2

SECTION 4 - YOUR JOB

4.1 What is your current employment status?

[*Please check* ONE *and fill out the question* NEXT *to your answer*]

○1 Not employed →

4.2 Which of the following best describes your situation?

- ○1 Between jobs / unemployed
- ○2 Full-time homemaker
- ○3 Student
- ○4 Retired
- ○5 Disability / long-term leave
- ○6 Other: (Please specify) ✎_____(4.2a)

☞ *If you are not currently employed, please* SKIP *the rest of this page and go to* PAGE 13

○2 Self-employed →

4.3 Do you employ other people?

○1 No

○2 Yes **How many?** ✎#_____ (4.3a)

4.3b How many clients / customers do you have in a year?

✎#_____ or ○9999 Not applicable

○3 Employee →

4.4 About how many people does your company employ?

[*Please check* ONE *answer*]

○1 1-24 employees ○2 25-99 employees

○3 100-499 employees ○4 500 or more employees

4.5 Do you have a second paid job?

[*Please check* ONE *answer*]

○1 No

○2 Yes - second job is self-employed

○3 Yes - second job is an employee

4.6,7 What is your paid occupation?

[If you have MORE THAN TWO JOBS*, please refer to the two jobs you consider* MOST IMPORTANT. *]*

Main job ✎_____

Second job ✎_____

4.8,9 On average, how many hours per week do you work?

Main job ✎#_____ hours per week

Second job ✎#_____ hours per week

During a typical week, what percentage of your work time is spent at the following places?

4.10 ✎%_____ Working at home

4.11 ✎%_____ At a regular workplace outside the home (such as office, factory, shop)

4.12 ✎%_____ Travelling (for example, to job sites, clients, business trips)

4.13 ✎%_____ At someone else's regular workplace (such as client's office, trade show, supplier's office)

4.14 Do you have an email account for work?

[*Please check* ONE *answer*]

○1 No

○2 Yes - exclusively for work

○3 Yes - for work and other reasons

4.15 Do you do any paid work at home?

[*Please check* ONE *answer*]

○1 Yes

○2 No ☞ *If* NO *then please* SKIP the rest of *this page and go to* PAGE 13

4.16,7 On average, how many <u>hours per week</u> do you work AT HOME?

Main job ✎#_____ hours at home per week

Second job ✎#_____ hours at home per week

4.* Is your work at home...

[*Please check* ALL *that apply*]

☐ 18 Related to your main job
☐ 19 Related to your second job

4.* Is your work at home...

[*Please check* ALL *that apply*]

☐ 1 Overtime
☐ 1 Regular work instead of going to another workplace

4.* What are your main reasons for working at home?

[*Please check* ALL *that apply*]

☐ 22 It is a requirement of the job
☐ 23 To catch up with work
☐ 24 Better working conditions at home
☐ 25 To avoid commuting
☐ 26 It saves time
☐ 27 It saves money
☐ 28 Childcare
☐ 29 Other family responsibilities
☐ 30 For my health
☐ 31 Other: ✎_____(4.31a)

[PLEASE LOOK AGAIN AT YOUR ANSWERS ABOVE
AND CIRCLE THE MOST IMPORTANT REASON FOR WORKING AT HOME]

4.*. Thinking about a typical day when you work at home:
How many times per DAY while you are home...

DO YOU CONTACT people related to work:

ARE YOU CONTACTED BY people related to work:

[*Write a* NUMBER *below for each activity* **even if** *you do it* **zero** *times during a typical day*]

32 I set up conference calls ✎#_____ times
33 I invite work contacts home ✎#_____ times
34 I send a fax ✎#_____ times
35 I start an instant messaging session ✎#_____ times
36 I phone ✎#_____ times
37 I leave voice mail ✎#_____ times

38 They set up conference calls ✎#_____ times
39 They invite me to their home for work ✎#_____ times
40 They send me a fax ✎#_____ times
41 They start an instant messaging session ✎#_____ times
42 They send work-related email ✎#_____ times
43 They phone ✎#_____ times
44 They leave voice mail ✎#_____ times

SECTION 5 - YOUR SPOUSE / PARTNER

5.1 What is your current relationship status?
[*Please check* ONE *answer*]

- ○ 1 Married
- ○ 2 Common-law
- ○ 3 Long-term relationship
- ○ 4 Single ☞
- ○ 5 Divorced ☞
- ○ 6 Widowed ☞
- ○ 7 Separated ☞

If you are currently single, divorced, widowed or spearated, please SKIP *the rest of this page and go to* PAGE 15.

5.2 Do you live with your spouse/partner? [*Please check* ONE *answer*]

- ○ 1 No
- ○ 2 Yes → **5.3 What year did you begin living together?**
  [✎ *Please write the* YEAR] 19___ or 20___

5.4 What is your spouse/partner's gender? [*Please check* ONE *answer*]

- ○ 1 Male
- ○ 2 Female

5.6 What is your spouse/partner's highest completed level of school?
[*Please check* ONE *answer*]

- ○ 1 Less than high school diploma
- ○ 2 High school diploma or G.E.D.
- ○ 3 College or technical school diploma
- ○ 4 Some university
- ○ 5 Undergraduate university degree
- ○ 6 Advanced university degree (such as Ph.D, Masters, law degree, medical degree)

5.7 Which of the follow best describes your spouse / partner's employment status?
[*Please check only* ONE *answer*]

- ○ 01 Self-employed
- ○ 02 Employed full-time
- ○ 03 Employed part-time
- ○ 04 Between jobs / unemployed
- ○ 05 Full-time homemaker
- ○ 06 Student
- ○ 07 Retired
- ○ 08 Disability / long-term leave
- ○ 09 Other: (Please specify) ✎ _____ (5.7a)

5.8 What is your spouse / partner's main occupation? ✎ _____

During a typical <u>week</u>, how many <u>hours do you spend</u> with your spouse/partner...

[*Please check* ONE *per row*]

	# of hours:	0	1-4	5-8 (average 1 hour /day)	9-12	13-16 (average 2 hours /day)	17-20	21+
5.9	Overall (not including sleep)	○1	○2	○3	○4	○5	○6	○7
5.10	Watching TV	○1	○2	○3	○4	○5	○6	○7
5.11	Using the Internet	○1	○2	○3	○4	○5	○6	○7
5.12	Doing other recreational things	○1	○2	○3	○4	○5	○6	○7

How often do you...

[*Please check* ONE *per row]*

		Not Applicable	Never	Less than monthly	About Monthly	About Weekly	About Daily
5.13	Call your spouse/partner from a cell phone	○9	○1	○2	○3	○4	○5
5.14	Call your spouse/partner from a regular phone	○9	○1	○2	○3	○4	○5
5.15	Email your spouse/partner when you are both in the same house	○9	○1	○2	○3	○4	○5
5.16	Email your spouse/partner when you are NOT in the same house	○9	○1	○2	○3	○4	○5
5.17	Instant message your spouse/partner when you are both in the same house	○9	○1	○2	○3	○4	○5
5.18	Instant message your spouse/partner when you are NOT in the same house	○9	○1	○2	○3	○4	○5

SECTION 6 - YOUR CHILDREN

6.1 Do you have any children? [*Please check* ONE *answer*]

○$_1$ Yes
○$_2$ No ☞

If you answered NO, *please* SKIP *the rest of this page and go to* PAGE 17

Please fill out following chart: Start with the oldest child. If you have more than 4, please fill out for the 4 oldest. For each child,

(1) **What are their ages? [For example: "6"]**
(2) **What is their gender?**
(3) **Are they living with you?**
(4) **What is the highest schooling they've completed? [For example: "primary" / "high school"]**
(5) **Do they have cell phones?**
(6) Are they experienced computer users?

		Age	Gender	Lives at home	Highest schooling completed	Has a cell phone	Experienced computer user
6.2-7	First Child	[ ]	○$_1$ Male ○$_2$ Female	○$_1$ Yes ○$_2$ No	[ ]	○$_1$ Yes ○$_2$ No	○$_1$ Yes ○$_2$ No
6.8-13	Second Child	[ ]	○$_1$ Male ○$_2$ Female	○$_1$ Yes ○$_2$ No	[ ]	○$_1$ Yes ○$_2$ No	○$_1$ Yes ○$_2$ No
6.14-19	Third Child	[ ]	○$_1$ Male ○$_2$ Female	○$_1$ Yes ○$_2$ No	[ ]	○$_1$ Yes ○$_2$ No	○$_1$ Yes ○$_2$ No
6.20-25	Fourth Child	[ ]	○$_1$ Male ○$_2$ Female	○$_1$ Yes ○$_2$ No	[ ]	○$_1$ Yes ○$_2$ No	○$_1$ Yes ○$_2$ No

During a typical week, in total how many hours do you spend with your child(ren)...
[*Please check only* ONE *per row*]

	# of hours: ➔	0	1-4	5-8 (average 1 hour /day)	9-12	13-16 (average 2 hours /day)	17-20	21+
6.38	Overall (not including sleep)	○1	○2	○3	○4	○5	○6	○7
6.39	Watching TV	○1	○2	○3	○4	○5	○6	○7
6.40	Using the Internet	○1	○2	○3	○4	○5	○6	○7
6.41	Doing other recreational things	○1	○2	○3	○4	○5	○6	○7

How often do you....
[*Please check only* ONE *per row*]

		Not Applicable	Never	Less than monthly	About Monthly	About Weekly	About Daily
6.26	Call your child(ren) from a cell phone	○9	○1	○2	○3	○4	○5
6.27	Call your child(ren) from a regular telephone	○9	○1	○2	○3	○4	○5
6.28	Email your child(ren) when you are both in the same house	○9	○1	○2	○3	○4	○5
6.29	Email your child(ren) when you are NOT in the same house	○9	○1	○2	○3	○4	○5
6.30	Instant message your child(ren) when you are both in the same house	○9	○1	○2	○3	○4	○5
6.31	Instant message your child(ren) when you are NOT in the same house	○9	○1	○2	○3	○4	○5

6.* At home, who is mainly responsible for monitoring your child(ren)'s Internet use?
[*Please check* ALL *that apply*]

☐9 Not applicable - we do not have the Internet at home
☐32 My child(ren) monitor themselves
☐33 I monitor my children
☐34 My spouse/partner monitors the children
☐35 We are equally responsible for monitoring
☐36 We use computer software to monitor the children
☐37 Other:_____(6.37a)

SECTION 7 - OTHER HOUSEHOLD MEMBERS

If your household consists only of you, a spouse/partner and/or children, please SKIP *this page and go to* PAGE 18.

In this section, we would like to know a little bit about any other people who live in your home and share the SAME KITCHEN with you.

Please fill out this chart for the 4 oldest household members that have not been mentioned yet, starting with the oldest. For each member,

(1) **How old are they? [For example: "39"]**
(2) **What is their gender?**
(3) **What is their relations to you? [For example: "grandmother", "roommate"]**
(4) **Do they have cell phones?**
(5) Are they experienced computer users?

		Age	Gender	Relation to you	Has a cell phone	Experienced computer user
7.1-5	Member 1	[ ]	○1 Male ○2 Female	[ ]	○1 Yes ○2 No	○1 Yes ○2 No
7.6-10	Member 2	[ ]	○1 Male ○2 Female	[ ]	○1 Yes ○2 No	○1 Yes ○2 No
7.11-15	Member 3	[ ]	○1 Male ○2 Female	[ ]	○1 Yes ○2 No	○1 Yes ○2 No
7.16-20	Member 4	[ ]	○1 Male ○2 Female	[ ]	○1 Yes ○2 No	○1 Yes ○2 No

Household Jobs

During a typical week, how many hours do you spend at home doing the following...

[*Please check only* ONE *per row*]

	# of hours: ➔	0	1-4	5-8 (average 1 hour /day)	9-12	13-16 (average 2 hours /day)	17-20	21+
7.21	Household chores and cleaning	○1	○2	○3	○4	○5	○6	○7
7.22	Cooking and baking	○1	○2	○3	○4	○5	○6	○7
7.23	Yard work and gardening	○1	○2	○3	○4	○5	○6	○7
7.24	Home repair and maintenance	○1	○2	○3	○4	○5	○6	○7
7.25	Childcare	○1	○2	○3	○4	○5	○6	○7

During a typical week, how many hours does your spouse/partner spend at home doing the following...

[*Please check only* ONE *per row*]

○9 Not Applicable *(skip the table and go to the question below)*

	# of hours: ➔	0	1-4	5-8 (average 1 hour /day)	9-12	13-16 (average 2 hours /day)	17-20	21+
7.26	Household chores and cleaning	○1	○2	○3	○4	○5	○6	○7
7.27	Cooking and baking	○1	○2	○3	○4	○5	○6	○7
7.28	Yard work and gardening	○1	○2	○3	○4	○5	○6	○7
7.29	Home repair and maintenance	○1	○2	○3	○4	○5	○6	○7
7.30	Childcare	○1	○2	○3	○4	○5	○6	○7

7.31 Does someone else in the household do these tasks?

[*Please check* ONE *answer*]

○1 No

○2 Yes ➔ **7.32 If YES: What is this person's relation to you?**

_____

During a typical week how do you do the the following, and how long does it take you?

[*Please check* ALL *that apply &* TOTAL HOURS *per week*]

	Yourself	Online	Phone	In person	Total hours per week
7.*	Keeping in touch with friends	☐33	☐34	☐35	→ 36 #_____
7.*	Keeping in touch with family	☐37	☐38	☐39	→ 40 #_____
7.*	Arranging social events with family or friends	☐41	☐42	☐43	→ 44 #_____
7.*	Shopping	☐45	☐46	☐47	→ 48 #_____
7.*	Taking care of finances	☐49	☐50	☐51	→ 52 #_____

During a typical week, how does your spouse/partner do the following, and how long does it take?

[*Please check* ALL *that apply &* TOTAL HOURS *per week*]

○9 Not Applicable - *I don't have a spouse/partner (skip the table and go to the question below)*

	Your spouse/partner	Online	Phone	In person	Total hours per week
7.*	Keeping in touch with friends	☐53	☐54	☐55	→ 56 #_____
7.*	Keeping in touch with family	☐57	☐58	☐59	→ 60 #_____
7.*	Arranging social events with family or friends	☐61	☐62	☐63	→ 64 #_____
7.*	Shopping	☐65	☐66	☐67	→ 68 #_____
7.*	Taking care of finances	☐69	☐70	☐71	→ 72 #_____

7.* Does someone else in the household do these tasks?

[*Please check* ALL *that apply*]

☐0 No

☐73 Yes, online →

☐74 Yes, by phone →

☐75 Yes, in person →

7.76 What is this person's relation to you?

_____

SECTION 8 - COMMUNICATING WITH HOUSEHOLD MEMBERS

Please write the number of devices in each of the following rooms...
[*Please write the NUMBER in each space*]

		Telephones	TVs	Personal computers
8.1-3	Kitchen	#_____	#_____	#_____
8.4-6	Rec room / family room	#_____	#_____	#_____
8.7-9	Office / study	#_____	#_____	#_____
8.10-12	Living room	#_____	#_____	#_____
8.13-15	Master bedroom	#_____	#_____	#_____
8.16-18	Child(ren)'s bedroom (If there is more than 1 room, write the total for all bedrooms)	#_____	#_____	#_____
8.19-22	Other 1: (such as spare bedroom) _____(8.19)	#_____	#_____	#_____
8.23-26	Other 2: _____(8.23)	#_____	#_____	#_____

If you DO NOT *have Internet access at home, then please* SKIP the rest of this page and go *to* PAGE 21

Please indicate how much you agree with the following...
[*Please check only* ONE *box per row*]

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Not applicable
8.27	Emailing has improved how I communicate with household members	○1	○2	○3	○4	○5	○9
8.28	Instant messaging has improved how I communicate with household members	○1	○2	○3	○4	○5	○9
8.29	The Internet has replaced time together as a household	○1	○2	○3	○4	○5	○9

		Never	Some of the time	About half of the time	Most of the time	All of the time
8.30	Are there disagreements among household members about who gets to use the Internet?	○1	○2	○3	○4	○5
8.31	Are there disagreements among household members about someone using the Internet too much?	○1	○2	○3	○4	○5
8.32	Do household members interrupt you when you are on the Internet at home?	○1	○2	○3	○4	○5

Section 9 - Your Personal Community

In this section, we are interested in learning about how you spend time with people **outside your household.**

How often do you...? [*Please check only* ONE *per row*]

		Daily	A few times a week	Once a week	A few times a month	Monthly or less	Never
9.1	Attend a regularly scheduled meeting such as a sports league, volunteer organization, or church group	○1	○2	○3	○4	○5	○6
9.2	Go to a regular hangout where you will know people (for example: a community centre, bar, mall, or coffee shop)	○1	○2	○3	○4	○5	○6
9.3	Drop into someone's house unannounced (or call just a few minutes ahead of time)	○1	○2	○3	○4	○5	○6
9.4	Have a conversation with your neighbours	○1	○2	○3	○4	○5	○6
9.5	Talk to people in an online chat room	○1	○2	○3	○4	○5	○6

9.6 Which best describes how you spend your leisure time with people outside your household?

[*Please check* ONE *answer*]

○1 Spend most of my leisure time by myself
○2 Spend most of it with just one or two people, who are usually the same people
○3 Spend most of it with just one or two people, who change from day to day
○4 Spend most of it with a single group of people
○5 Divide my time among different groups of people

Please think about the people currently in your life who do not live with you. We would like you to consider those who you are VERY close to, and those who you are SOMEWHAT close to.

VERY CLOSE:
- Those that you discuss important matters with,
- Those that you regularly keep in touch with, or
- Those who are there for you if you need help.

SOMEWHAT CLOSE:
- More than just casual acquaintances, but not 'very close'.

In this section you'll find it helpful to use the attached tear-off worksheet. There is no need to return the worksheet with the survey.

? **About h<u>ow many people</u> are you VERY close to?**
About how many people are you SOMEWHAT close to?

[*Count each person only* ONCE, *use the* WORKSHEET *to remember names*]
[Please count *only people* OUTSIDE *your HOME*]

		VERY close	SOMEWHAT close
9.7,8	Members of your **immediate family** who don't live with you (such as parents, siblings, children)	#_____	#_____
9.9,10	Other **relatives**	#_____	#_____
9.11-2	Neighbours	#_____	#_____
9.13-4	People you currently **work** with, or go to school with	#_____	#_____
9.15-6	People you know only **online**	#_____	#_____
9.17-8	People from **organizations** (such as church, sports leagues, business associations)	#_____	#_____
9.19-20	**Friends** not included above	#_____	#_____
9.21-2	**Other people** not included above Relationship to you: [ ] (9.22a)	#_____	#_____

The next few pages will be about these two types of people - those you feel VERY close to and those you feel SOMEWHAT close to. Please refer to the worksheet if you need to refresh your memory.

[*Please write the NUMBER in each space*]

	About how many of these two types of people are...	VERY close	SOMEWHAT close
9.23-4	Women	#_____	#_____
9.25-6	Men	#_____	#_____

	About how many of these two types of people...	VERY close	SOMEWHAT close
9.27-8	Live in Canada and more than an hour's travel away	#_____	#_____
9.29-30	Live outside of Canada	#_____	#_____

	About how many of these two types of people...	VERY close	SOMEWHAT close
9.31-2	Do you call by **cell phone**, typically at least once a week	#_____	#_____
9.33-4	Do you call by **cell phone**, typically between once a week and once a month	#_____	#_____
9.35-6	Do you call by **telephone**, typically at least once a week	#_____	#_____
9.37-8	Do you call by **telephone**, typically between once a week and once a month	#_____	#_____
9.39-40	Do you send an **email** to, typically at least once a week	#_____	#_____
9.41-2	Do you send an **email** to, typically between once a week and once a month	#_____	#_____
9.43-4	Do you send an **instant message** to, typically at least once a week	#_____	#_____
9.45-6	Do you send an **instant message** to, between once a week and once a month	#_____	#_____
9.47-8	Do you talk with **face to face**, typically at least once a week	#_____	#_____
9.49-50	Do you talk with **face to face**, typically between once a week and once a month.	#_____	#_____
9.51-2	Meet you at a **bar or restaurant**, typically at least once a week	#_____	#_____
9.53-4	Meet you at a **bar or restaurant**, typically between once a week and once a month	#_____	#_____
9.55-6	**Visit you at home** (or will have you as a visitor), typically at least once a week.	#_____	#_____
9.57-8	**Visit you at home** (or will have you as a visitor), typically between once a week and once a month	#_____	#_____

Think about planning with all of the people who are VERY close. In total, how often do you do the following...

[*Please check only* ONE *per row*]

	VERY Close	About Daily	A few times a week	Once a week	A few times a month	Monthly or less	Never
9.59	Make plans in person	○1	○2	○3	○4	○5	○6
9.60	Make plans by cell phone (voice)	○1	○2	○3	○4	○5	○6
9.61	Make plans by cell phone (text)	○1	○2	○3	○4	○5	○6
9.62	Make plans by regular phone	○1	○2	○3	○4	○5	○6
9.63	Make plans by email	○1	○2	○3	○4	○5	○6
9.64	Make plans by instant messaging	○1	○2	○3	○4	○5	○6
9.65	Reschedule your plans	○1	○2	○3	○4	○5	○6
9.66	Break your plans	○1	○2	○3	○4	○5	○6
9.67	Forget to meet someone	○1	○2	○3	○4	○5	○6
9.68	Arrive late	○1	○2	○3	○4	○5	○6

Think about planning with all of the people who are SOMEWHAT close. In total, how often do you do the following...

[*Please check only* ONE *per row*]

	SOMEWHAT Close	About Daily	A few times a week	Once a week	A few times a month	Monthly or less	Never
9.69	Make plans in person	○1	○2	○3	○4	○5	○6
9.70	Make plans by cell phone (voice)	○1	○2	○3	○4	○5	○6
9.71	Make plans by cell phone (text)	○1	○2	○3	○4	○5	○6
9.72	Make plans by regular phone	○1	○2	○3	○4	○5	○6
9.73	Make plans by email	○1	○2	○3	○4	○5	○6
9.74	Make plans by instant messaging	○1	○2	○3	○4	○5	○6
9.75	Reschedule your plans	○1	○2	○3	○4	○5	○6
9.76	Break your plans	○1	○2	○3	○4	○5	○6
9.77	Forget to meet someone	○1	○2	○3	○4	○5	○6
9.78	Arrive late	○1	○2	○3	○4	○5	○6

When talking with people you are VERY close to, how often do you get new information about...
[*Please check only* ONE *box per row*]

	VERY Close	About Daily	About Weekly	About Monthly	Less than monthly	I do not discuss this
9.79	Political issues	○1	○2	○3	○4	○5
9.80	Musicians or musical groups	○1	○2	○3	○4	○5
9.81	Restaurants	○1	○2	○3	○4	○5
9.82	Movies	○1	○2	○3	○4	○5
9.83	Books	○1	○2	○3	○4	○5
9.84	Issues related to your job	○1	○2	○3	○4	○5

When talking with people SOMEWHAT close, how often do you get new information about...
[*Please check only* ONE *box per row*]

	SOMEWHAT Close	About Daily	About Weekly	About Monthly	Less than monthly	I do not discuss this
9.85	Political issues	○1	○2	○3	○4	○5
9.86	Musicians or musical groups	○1	○2	○3	○4	○5
9.87	Restaurants	○1	○2	○3	○4	○5
9.88	Movies	○1	○2	○3	○4	○5
9.89	Books	○1	○2	○3	○4	○5
9.90	Issues related to your job	○1	○2	○3	○4	○5

Do you know someone VERY close or SOMEWHAT close who does any of the following jobs?

[*Please check* ALL *that apply*]

		VERY close	SOMEWHAT close
9.*	Lawyer	☐91	☐92
9.*	Truck driver	☐93	☐94
9.*	Pharmacist	☐95	☐96
9.*	Janitor or caretaker	☐97	☐98
9.*	Engineer	☐99	☐100
9.*	Cashier	☐101	☐102
9.*	Waiter or waitress	☐103	☐104
9.*	Carpenter	☐105	☐106
9.*	Computer programmer	☐107	☐108
9.*	High school teacher	☐109	☐110
9.*	Human resources manager	☐111	☐112

How many of the following people know each other?

[*Please check only* ONE *per row*]

		None know each other	Only some know each other	About half know each other	Most know each other	They all know each other
9.113	Only the people you feel SOMEWHAT close to	○1	○2	○3	○4	○5
9.114	Only the people you feel VERY close to	○1	○2	○3	○4	○5
9.115	ALL of these people TOGETHER	○1	○2	○3	○4	○5

SECTION 10: YOUR CULTURAL HERITAGE

While many people in Canada view themselves as Canadians, to what ethnic or cultural group did your ancestors belong? (For example, English, Chinese, East Indian, or French)

[*If they belonged to more than one group, please list the 1 or 2 ethnic groups that you most closely identify with*]

10.1 _____

10.2 _____

Thinking again of the people you are **Very** close to or **Somewhat** close to...

About how many of these people are your own ethnicity?	VERY close	SOMEWHAT close
10.3-4	#_____	#_____

[*Please write the NUMBER in each space* **even if** *the number is* **zero**]

Not including those of your own ethnicity, about how many of these people are...		VERY close	SOMEWHAT close
10.5-6	Hispanic or Latino	#_____	#_____
10.7-8	South Asian (such as Indian, Pakistani, Sri Lankan)	#_____	#_____
10.9-10	East Asian (such as Chinese, Filipino, Korean, Thai)	#_____	#_____
10.11-12	Middle Eastern (such as Lebanese, Iranian)	#_____	#_____
10.13-14	First Nations, Inuit, Métis	#_____	#_____
10.15-16	Black or African-Canadian	#_____	#_____
10.17-18	White	#_____	#_____
10.19-20	Other _____(10.20a)	#_____	#_____

10.20b What language do you speak most often at home?

○ 0 English, or...

[Please write the language] _____

10.21 In what country were you born?

○ 0 Canada, or...

[Please write the country]

_____ and... →

10.22 What year did you arrive in Canada?

[*Please write the* YEAR]

19___ or 20___

Section 11 - Social Support

This section is about the help you receive from and give to others.

Please look at the following situations.
Circle the groups of people who you would receive help from, and who you would give help to.

[*For this page, please* CIRCLE *ALL That Apply*]
[*Use the WORKSHEET to refresh your memory*]

	HouseHold members	Immediate Family	Other Relatives	Neighbours	or go to School with	currently Work with	know only oNLine	from oRGanizations	Other FRiends	OTher
Advice on important matters										
Receive advice from	HH_{0}	IF_{1}	OR_{2}	N_{3}	WS_{4}	NL_{5}	RG_{6}	FR_{7}	OT_{8}	
Give advice to	HH_{10}	IF_{11}	OR_{12}	N_{13}	WS_{14}	NL_{15}	RG_{16}	FR_{17}	OT_{18}	
Advice about new job opportunities										
Receive advice from	HH_{20}	IF_{21}	OR_{22}	N_{23}	W_{24}	NL_{25}	RG_{26}	FR_{27}	OT_{28}	
Give advice to	HH_{30}	IF_{31}	OR_{32}	N_{33}	WS_{34}	NL_{35}	RG_{36}	FR_{37}	OT_{38}	
Care for a serious health condition										
Receive care from	HH_{40}	IF_{41}	OR_{42}	N_{43}	WS_{44}	NL_{45}	RG_{46}	FR_{47}	OT_{48}	
Provide care to	HH_{50}	IF_{51}	OR_{52}	N_{53}	WS_{54}	NL_{55}	RG_{56}	FR_{57}	OT_{58}	
Help with home renovations										
Receieve help from	HH_{60}	IF_{61}	OR_{62}	N_{63}	WS_{64}	NL_{65}	RG_{66}	FR_{67}	OT_{68}	
Give help to	HH_{70}	IF_{71}	OR_{72}	N_{73}	WS_{74}	NL_{75}	RG_{76}	FR_{77}	OT_{78}	
Help looking for information about a health issue										
Receive help from	HH_{80}	IF_{81}	OR_{82}	N_{83}	WS_{84}	NL_{85}	RG_{86}	FR_{87}	OT_{88}	
Give help to	HH_{90}	IF_{91}	OR_{92}	N_{93}	WS_{94}	NL_{95}	RG_{96}	FR_{97}	OT_{98}	
Advice on using a personal computer										
Receive advice from	HH_{100}	IF_{101}	OR_{102}	N_{103}	WS_{104}	NL_{105}	RG_{106}	FR_{107}	OT_{108}	
Give advice to	HH_{110}	IF_{111}	OR_{112}	N_{113}	WS_{114}	NL_{115}	RG_{116}	FR_{117}	OT_{118}	
To be there just to talk about the day										
They will be there to listen to you	HH_{120}	IF_{121}	OR_{122}	N_{123}	WS_{124}	NL_{125}	RG_{126}	FR_{127}	OT_{128}	
You will be there to listen to them	HH_{130}	IF_{131}	OR_{132}	N_{133}	WS_{134}	NL_{135}	RG_{136}	FR_{137}	OT_{138}	

Are you a member of any voluntary organizations? ○Yes ○No
Are you an active member, that is, you regularly attend meetings, contribute time or money, or hold a leadership position.

[*Please check* ONE *per row &* NUMBER *of years*]

		Not a member	Member, but not active	Active member		Number of years as an active member
11.139	Business association	○1	○2	○3 →	(11.139a)	#_____
11.140	Professional association	○1	○2	○3 →	(11.140a)	#_____
11.141	A sport's league	○1	○2	○3 →	(11.141a)	#_____
11.142	Your child's sports league	○1	○2	○3 →	(11.142a)	#_____
11.143	Religious organization	○1	○2	○3 →	(11.143a)	#_____
11.144	Hobby group or club	○1	○2	○3 →	(11.144a)	#_____
11.145	Community service group	○1	○2	○3 →	(11.145a)	#_____
11.146	Ethnic association	○1	○2	○3 →	(11.146a)	#_____
11.147	Environmental group	○1	○2	○3 →	(11.147a)	#_____
11.148	Labour union	○1	○2	○3 →	(11.148a)	#_____
11.149	Women's group	○1	○2	○3 →	(11.149a)	#_____
11.150	Other _____ (11.150b)	○1	○2	○3 →	(11.150a)	#_____

SECTION 12 - YOUR OPINIONS

How much do you agree or disagree with the following statements? [*Please check* ONE *per row*]

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
12.1	I am responsible for my own successes	○1	○2	○3	○4	○5
12.2	I can do just about anything I really set my mind to	○1	○2	○3	○4	○5
12.3	My misfortunes are the result of mistakes I have made	○1	○2	○3	○4	○5
12.4	The really good things that happen to me are mostly luck	○1	○2	○3	○4	○5
12.5	Most of my problems are due to bad breaks	○1	○2	○3	○4	○5
12.6	I have little control over the bad things that happen to me	○1	○2	○3	○4	○5
12.7	I am responsible for my failures	○1	○2	○3	○4	○5
12.8	There is no sense planning a lot - if something is going to happen it will	○1	○2	○3	○4	○5

SECTION 12 - YOUR OPINIONS (CONTINUED)

How much do you agree or disagree with the following statements? [*Please check* ONE *per row*]

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
12.9	I am outgoing and sociable	○1	○2	○3	○4	○5
12.10	I am original, coming up with new ideas	○1	○2	○3	○4	○5
12.11	I am reserved	○1	○2	○3	○4	○5
12.12	I am sometimes shy and inhibited	○1	○2	○3	○4	○5
12.13	I have an active imagination	○1	○2	○3	○4	○5
12.14	I have an assertive personality	○1	○2	○3	○4	○5
12.15	I am curious about many different things	○1	○2	○3	○4	○5
12.16	I am talkative	○1	○2	○3	○4	○5
12.17	I prefer work that is routine	○1	○2	○3	○4	○5
12.18	I like to explore new art, music or literature	○1	○2	○3	○4	○5
12.19	I tend to be quiet	○1	○2	○3	○4	○5

How much do you agree or disagree with the following statements? [*Please check* ONE *per row*]

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
12.20	We should be more tolerant of people who choose to live according to their own standards, even if they are very different from our own	○1	○2	○3	○4	○5
12.21	We have gone too far in pushing equal rights in this country	○1	○2	○3	○4	○5
12.22	This country would have fewer problems if there were more emphasis on traditional family values	○1	○2	○3	○4	○5
12.23	It is more difficult for non-whites to be successful in Canadian society than it is for whites	○1	○2	○3	○4	○5

12.24 Do you generally think of yourself as being a little closer to one of the federal parties than to the others? Please check which party you think you are closest to...

○1 Conservative ○2 Liberal ○3 NDP ○4 Other _____(12.24a)

Section 13 - Conclusion

13.1 Do you have a particular religion or faith? [*Please check* ONE *answer*]

- ○ 1 None
- ○ 2 Protestant - Which denomination? (13.2) _____
- ○ 3 Roman Catholic
- ○ 4 Muslim / Islamic
- ○ 5 Hindu
- ○ 6 Sikh
- ○ 7 Confucian
- ○ 8 Other (13.3) _____

13.4 What was your <u>PERSONAL income</u> last year before taxes?

[*Please check* ONE *answer*]

Under $20,000	○ 1
$20,000 to under $30,000	○ 2
$30,000 to under $40,000	○ 3
$40,000 to under $50,000	○ 4
$50,000 to under $75,000	○ 5
$75,000 to under $100,000	○ 6
$100,000 to under $150,000	○ 7
$150,000 or more	○ 8

13.4 What was your <u>HOUSEHOLD income</u> last year before taxes?

[*Please check* ONE *answer*]

Under $20,000	○ 1
$20,000 to under $30,000	○ 2
$30,000 to under $40,000	○ 3
$40,000 to under $50,000	○ 4
$50,000 to under $75,000	○ 5
$75,000 to under $100,000	○ 6
$100,000 to under $150,000	○ 7
$150,000 or more	○ 8

On behalf of the NetLab team at the University of Toronto, thank you very much for completing this survey.

Someone should be dropping by your house soon to pick up your survey.
If you would like to arrange a specific time for pick-up please call 416-978-0250.

Remeber to include the consent form when returning the survey

☺☺☺ Thank You ☺☺☺

Appendix B

Connected Lives Minisurvey

This one-page document describes the questions asked about the alters in the Connected Lives interview. Up to fifteen alters per-network were chosen for this minisurvey. Details about which alters and why those alters were chosen can be found in Chapter 4 as well as Hogan et al. (2007).

First name : _____

Age: ☐ under 20 ☐ 20s ☐ 30s ☐ 40s ☐ 50s ☐ 60s ☐ 70+

Questions to be said **outloud:**

Relation to you? _____ Type of Job?_____

Ethnic heritage? _____

Where he/she lives? **Say** city or if in Greater Toronto Area, **say** nearest intersection.

Where do you usually see him/her? **Say** city or if in Greater Toronto Area, ***say*** nearest intersection.

Face-to-Face

How often do you see him / her **face to face**?

✎#____ times per ☐ Year ☐ Month ☐ Week ☐ Day

On average, how long do you spend together when you **meet**?

✎#___ minutes or ✎#___ hours

Which of the following best applies?

☐ **I usually go** to see him/her
☐ **S/he usually comes** to see me
☐ We go to see each other **equally**
☐ We mainly talk when we **happen to see each other**

Socializing

How often do you **socialize** with him or her?

✎#____ times per ☐ Year ☐ Month ☐ Week ☐ Day

On average, how long do you spend together when you **socialize**?

✎#___ minutes or ✎#___ hours

Who invites who?

☐ **I usually invite** him/her
☐ **S/he usually** invites me
☐ We go to see each other **equally**
☐ **Someone else** invites both of us
☐ We socialize at a **regular meeting**

Telephone

How often do you talk by **telephone** with him or her?

✎#____ times per ☐ Year ☐ Month ☐ Week ☐ Day

On average, how long are your **phone conversations**?

✎#___ minutes or ✎#___ hours

Who usually calls who?

I call him/her ..... 1 2 3 4 5 ..... S/he always calls me

We call equally

When you talk with him/her what kind of **phone do you use?**

Landline ..... 1 2 3 4 5 ..... Cell phone

both

When s/he talks with you, what kind of **phone does s/he use**?

Landline ..... 1 2 3 4 5 ..... Cell phone

both

Email

How often do you **email** him or her?

✎#____ times per ☐ Year ☐ Month ☐ Week ☐ Day

Your **emails** are usually? (please circle)

Short ..... 1 2 3 4 5 ..... Long

Who usually **starts** the email conversation? (please circle)

Me ..... 1 2 3 4 5 ..... Him/Her

both

Instant Messaging

How often do you **instant message** with him or her?

✎#____ times per ☐ Year ☐ Month ☐ Week ☐ Day

On average, how long are your **instant message** conversations?

✎#___ minutes or ✎#___ hours

Who usually **starts** the instant message conversations? (please circle)

Me ..... 1 2 3 4 5 ..... Him/Her

both