Theses and dissertations

1-1-2009

Factors affecting bridging social capital in on-line professional networks : an exploratory study of social capital formation on LinkedIn

Natalia Gilewicz
Ryerson University

Follow this and additional works at: http://digitalcommons.ryerson.ca/dissertations

Part of the Sociology Commons

Factors Affecting Bridging Social Capital in On-Line Professional Networks: An Exploratory Study of Social Capital Formation on LinkedIn

By

Natalia Gilewicz

A thesis

Presented to Ryerson University

In partial fulfillment of the

Requirements for the degree of

Master of Management Science (MMSc)

in the program of

Management of Technology and Innovation

Toronto, Ontario, Canada, 2009

© Natalia Gilewicz, 2009

Author's Declaration

I hereby declare that I am the sole author of this thesis. I authorize Ryerson University to lend this thesis to other institutions or individuals for the purpose of scholarly research.

_____   _____
Natalia Gilewicz

I further authorize Ryerson University to reproduce this thesis or dissertation by photocopying or by other means in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

_____   _____
Natalia Gilewicz

Abstract

Factors affecting bridging social capital on LinkedIn.com

Master of Management Science (MMSc)

Management of Technology and Innovation

Ryerson University

© Natalia Gilewicz, 2009

This thesis investigates factors contributing to bridging social capital on LinkedIn. An online social network is one that allows users to make and share contacts by way of displaying their network (Boyd & Ellison, 2007). The intention of a network such as LinkedIn, is to create professional opportunities for its participants. Here, social capital is seen as the resource embedded within the social network, and as such is conceptualized as the benefit associated with online social network participation. Bridging social capital typically exists between weakly tied colleagues. It has been said to be a superior type of social capital for 'getting ahead' (Putnam, 2000). Understanding how to create opportunities to increase bridging social capital in an online environment is useful to potentially overcoming barriers that exist offline. Using the partial least squares approach to structural equation modeling, the thesis analyzes data collected from an online survey (n:167) of LinkedIn members. Driven by theory, three constructs are conceptualized as contributing to the variance in bridging social capital. Ease of use, browsing behaviours, and bonding social capital all have a positive relationship with bridging social capital, and together explain 53.8% of this variance. These findings are then extended to explore the broader design implications they have on online social network.

Acknowledgements

I strongly believe that everyone we come into contact with, no matter how insignificant the interaction, has an impact on our lives. Then there are those that leave a lasting imprint of themselves on us for better or for worse.

I thank my family who has always supported me through thick and thin. In particular I thank my mom, Mila Romaniuk, who has sacrificed so much to ensure my success.

I'd also like to thank my amazing friends. Mahshid I could never make YaSoSoYa sauce without you!

Thank you to the Ryerson community and the Ted Rogers School of Management for the tremendous support throughout this process. Most importantly, thank you to my supervisor, Dr. Ojelanki Ngwenyama who has taught me everything I know about research. I have never met anyone with such a high standard for teaching. Thank you for challenging me.

Table of Contents

List of Figures

List of Tables

1 Introduction

The release of Bowling Alone by Robert Putnam in 2000 has seemingly reinvigorated the research community's interest in Social Capital. In his book, Putnam articulates his concerns for social capital and civic engagement decreasing in America—being replaced with forms of solitary entertainment. One aspect of this debate concentrates on how the Internet affects social capital. However, with the number of uses it serves, the Internet as a measurement unit is no longer as useful, particularly because some online activities are social while others are not (Lin, 2001). As such this research specifically investigates online social networks from the theoretical perspective of social capital.

Social capital has very much become a broad concept used in many contexts ranging from studies in family, youth behaviour, schooling, public health, community life, government, economic development and collective action (Adler & Kwon, 2002). The definition used to anchor this thesis posits that social capital can be defined in the simplest terms as an investment is social relations with expected returns (Lin, 2001). This would indicate that individuals, who invest time and effort to maintain a social network, can then benefit from embedded assets. For example keeping in touch with colleagues from one's current workplace, can create future opportunities as people leave jobs and move elsewhere. They can also be used to uncover new information about individuals that can help each other. As such one can invest in building social capital, which can be seen as an asset that one may choose to use in different situations. I will further explore the ability of certain types of social capital to help people 'get ahead'.

The origin of questions presented by this research stems from the desire to understand why individuals participate in online social networks, and what they receive as a benefit from this participation. The definition of online social networks generally accepted by the research community broadly identifies these sites as allowing members to create a profile, connect with others, and display these connections (Boyd & Ellison, 2007). This definition however, does not capture any particular benefit of a social network. This research suggests that one potential way in which to conceptualize this benefit is through the lens of social capital. Given Lin's definition of social capital it can be seen that an investment in the network can have possible returns.

In this thesis, LinkedIn, a professional online social network, is used to test potential factors contributing to social capital. Breaking out this type of online activity allows for a more specific measurement of social capital. Moreover, because social capital is such a broad concept, it is also further dissected, in order to better position the thesis, into bonding and bridging social capital. Bonding social capital exists between strongly tied individuals such as close friends and kin, while bridging capital exists between loosely tied individuals such as colleagues (Putnam, 2000). It is the latter that Putnam suggests can be used to get ahead. Given that LinkedIn is a network engineered to grow one's professional contacts, this research will focus on factors contributing to bridging social capital.

Given that social capital can be used as an asset or resource, building social capital can be positive. While the focus of the thesis is to understand factors that contribute to building social capital, and more specifically bridging capital, I further extend the finding s to explain how this may impact the design of social networks.

Meaning, once one understands some of these factors, the network design can move to successfully facilitate bridging social capital online. Thus I will explore how this research affects the broader design implications of an online network.

The thesis is divided into 7 chapters. The remainder of Chapter 1 identifies the research objectives for the study. It also classifies the epistemological perspective of the research. The literature review of current research in online social networks follows, with a look at the different areas of study in the field. Chapter 4 moves to explore social capital, positioning the research within the broad area of social capital study. This allows for the operationalization of the proposed theoretical constructs and presentation of a model along with three hypotheses. Chapter 5 explores the research methods utilized in the study, as well as presenting the findings. Following the findings, limitations and areas of future research are discussed in Chapter 6. Lastly, in Chapter 7, we conclude with an investigation of the broader design implications of the finding.

1.1 Research objectives

A study conducted by PEW showed that, in May 2008, 29% of Internet users reported using a social network.[1] On December 14th, 2008, only seven months later, there were several social network sites listed as the most frequently visited sites in the world.[2] Social network sites are a new and immature technology, but growing at exponential speeds. My interest in social networks stems from their popularity and rapid rate of acceptance. While my initial interest was rooted in trying to understand the benefit of

---

[1] http://www.pewinternet.org/trends/Internet_Activities_7.22.08.htm
[2] http://www.alexa.com/site/ds/top_sites

2

3

such networks, I began to narrow the scope in order to keep my research as empirical as possible.

The theoretical background I have chosen to frame the benefits associated with online social networks is social capital. Social capital is able to capture the benefit in the networks themselves. Prior research in the area primarily explores the impact of Internet use on social capital. Generally, the research identifies three broad schools of thought on this topic; the Internet increases, decreases or supplements social capital (Quan-Haase & Wellman, 2004). However, online social networks are different than other sites on the Internet, and even more so different than the Internet as a whole (Wellman, 1997). Few studies looking at social capital and online social networks currently exist. As such this thesis contributes to a new area of research.

Further, social capital research is plagued with many definitions and few studies, which successfully operationalize and measure it as a phenomenon. As such, this thesis also contributes to the theoretical framework of social capital. Social capital theory informs us that there can be different types of social capital; with one of the most popular typologies identified by Putnam (2000) as being bonding social capital and bridging social capital. Putnam explains that where bonding occurs between closely tied individuals, bridging occurs within more weakly tied networks of relationships.

Given work previously done by Granovetter (1973) on the benefits of weakly tied networks, I chose to use bridging social capital as the benefit of participating in online social networks. I chose to use LinkedIn, a network for professionals, for the study. Given my own experiences with online social networks, I posit that online interactions

within a social network predominantly revolve around the creation of bridging social capital—particularly in the professional setting offered by LinkedIn.

Thus, in addition to broadly contributing to the new field of online social network research, as well as the measurement of social capital, this thesis has two main objectives. First, I attempt to identify factors that may impact bridging social capital online. Second, I empirically test the predictive value of those factors on bridging social capital using structural equation modeling. The result is a predictive model that contributes to our understanding of bridging social capital on LinkedIn.

1.2 Epistemological orientation from the functionalist paradigm

The purpose of this thesis is to identify factors, which influence bridging social capital formation online. This is done from the perspective of the functionalist paradigm. The research is deductive, drawing on existing theoretical frameworks. As such the hypothetico-deductive approach to the knowledge reproduction cycle is applied. The steps involved with this approach include theory formulation, hypothesis generation, hypothesis testing, and presentation of findings.

In *Sociological Paradigms and Organizational Analysis*, Burrell and Morgan (1979) explore four paradigms illustrated in a 2x2 matrix, with subjectivism/objectivism, and sociology of radical change/sociology of regulation on opposite ends of the spectrum respectively. Within this matrix, functionalists tend toward social regulation and objectivism (Burrell & Morgan, 1979). Table 1 identifies some further details of each functionalist quadrant.

Table 1: Breakdown of the Functionalist Paradigm

Sociology of Regulation	Objectivism
• Concerned with providing explanations of society in terms which emphasize unity and cohesiveness • Assumes that society holds together as opposed to being pulled apart	• Realism: The social world is a *hard* structure that exists with or without the labels we impose on it. • Logical Positivism: One can seek to find patterns and use them to predict future outcomes (hypothesis testing) • Determinism: humans are determined by their environment • Nomothetic: surveys and hypothesis testing can be used to figure out the world

There are two reasons why the functionalist paradigm is well suited for this research. Firstly, understanding individuals from a utility-maximizing perspective is important because this research is largely focused on the benefits of social capital to individuals. An underlying assumption here is that people will exhibit observable behaviour, which is meant to be beneficial to them in some way. In cases where they do not, they can be steered in a new direction by transforming their environment—or in this case facilitating the occurrence of factors that contribute to bridging social capital. Further beneficial to the content is the idea that people tend toward social regulation as it allows us to understand why displaying ones' social network is a valuable tool to create community and cohesiveness. (Boyd & Ellison, 2007)

The ability to test hypotheses is another benefit. Here the hypothetico-deductive approach is applied. Thus, we enter the knowledge reproduction cycle by way of theory formulation. While constructing a new theory can be an entry point, choosing an existing theory (or theories), as in the case of this research, is an equally appropriate first step. The next phase allows the researcher to formulate measurable hypotheses that are a result of the theoretical claims inherent in the chosen framework. Thus the framework is operationalized and support for the hypotheses can be tested. The method used to test the research questions depends on the type of data collected. Here surveys are used to collect quantitative data, of which the predictive value is then examined using partial least squares (PLS) structural equation modeling, discussed later in Chapter 5. The last step in the cycle requires the researcher to present the data against what was originally hypothesized. If the empirical data does not support the original claims, the cycle begins again with theory modification. Because of the logical cyclical nature of this process, the functionalist paradigm is also a good starting point for new researchers like myself. A literature review of the key research concepts follows.

2 Literature Review

This research interrogates online social networks from a social capital perspective. Thus, this literature review begins with an analysis of online social networks. Key concepts surrounding this new technology are explored. Social networking sites allow users to create and share profiles (Boyd & Ellison, 2007). They are new, and different than previously studied online communities, as a result of being egocentric rather than interest based (Wellman, 1997). An exploration of the main research areas within social network sites follows. These areas include research in impression management, network and network structure, online versus offline networks, privacy and socio-demographics. Additional summaries of work done in online social networks can be found in Appendix A.

2.1 Key concepts in Online Social Networks

Broadly, online social networks can be defined as sites that allow members to

1. Create a public, private, or semi-private profile,

2. Share their connection with selected users, and

3. See the profiles of the connections made. (Boyd & Ellison, 2007)

In research, these networks are often treated as online groups or communities. However, researchers are beginning to acknowledge that they are different in several ways. Firstly, their purpose is to display the network in order to uncover latent ties that may not have been found otherwise (Haythornthwaite, 2005). Secondly, they are primarily organized around people, not interests—as such they mirror the social structures we see offline, producing networks of actors, not groups (Wellman, 1997). Thus, they are not meant to be a place where individuals come together to work towards a common goal, as in the case of communities, but rather just a place for them to connect. On the other hand, there are similarities that can be drawn between online communities and social networks. For example in mirroring the *real* world, social network sites tend to attract individuals that initially segregate themselves by nationality, age, education level and etc. (Hargittai, 2007). This however is a not the intention of the networks. In fact one of the benefits of social networks is the possibility of overcoming this segregation, and forming highly heterogeneous groups of individuals, within which the poorer can get richer. Studies that treat online social network sites are as new and separate entities have already found support for this to be true. (Ellison, Steinfield, & Lampe, 2007; Valenzuela, Park, & Kee, 2008)

The popularity of these types of sites began in 2001, though examples of them existed in prior years. As a result of their viral acceptance, researchers are focused on the effects they will have on various aspects of our lives. Current studies in social networks are centered around the concepts of impression management, network and network structure, the relationship between online and offline networks and privacy. (Boyd & Ellison, 2007) While some of these constructs are outside of the scope of this thesis, an overview of each will follow.

2.1.1 Impression Management

In a seminal book about impression management, The Presentation of Self in Everyday Life, Goffman explores the concept that people manage what they would like others to think of them (Goffman, 1978). This is relevant in the social network space because there is a highly public purpose for site membership in that we join to be *seen*. Thus, one would infer that creating an online profile is representative of one's identity.

However, nonverbal cues are missing during interactions making impression management different online than it is offline (Marwick, 2005). Furthermore, the ability of contacts to comment on each other's profiles make social networks different than computer mediated communication (CMC) technologies in general. In addition to a user's ability to impact another person's reputation, the open display of user contacts keeps them honest, thus making profiles in social network sites more authentic insert ref. Whether the online identity is seen socially or professionally, by close friends or by business contacts is typically determined by the type of site. However, in either case the viewers of the site form impressions of the individual.

Reputation, or the public image of a person, is another way to interpret impression management. Reputation is particularly important when individuals have friends in common (Burt, 1992). Goffman identifies that one can have a front and a back stage representation of oneself. The first being public, seen by everyone, and the latter being more private, displayed to a particular group. If the concept of reputation is public, the ability for users to manage their reputation in a social network environment becomes exponentially important, because contact networks are typically enlarged to include not only friends, but also friends of friends, their friends and so forth. To exemplify this concept, while a user may share pictures from a party with their close friends, who know that the individual attends few parties in a given year, outsiders (friends of friends) may form the impression that the individual is a frequent partygoer—thus changing their reputation. This scenario could not occur in an offline environment.

While this larger network of individuals is one point of difference for online versus offline impression management, there are other factors to consider. Firstly, as with

other CMC, it is important to point out that the nonverbal cues are missing during interactions (Marwick, 2005). While this leaves possible gaps in interpretation, the positive side of this is that the impressions made can be more thought out and controlled, than face-to-face interactions (Haferkamp & Krämer, 2008). What makes social networks different from CMC however, is that the user does not have complete control of their reputation because their contacts typically also have the ability to make comments on the profile. These *external* comments are considered when an impression is formed (Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). This can have potential hazardous effects. For example, one study identified that 50% or surveyed Facebook users had a friend post a photo they did not want displayed online. Secondly, users tend to perceive that they have a higher level of control over information online then they actually do—revealing more about themselves personally than they are conscious of (Skog, 2005). The result could mean that individuals are unknowingly mismanaging their online identity, or even worse, damaging their reputation.

In addition to the differences between online and offline interactions, another important aspect of online impression management is the perception of profile authenticity. One mechanism to ensure truthfulness in a social network profile is the display of connections. Because users are joined to a group of individuals who can see their profile, it is possible that deceivers may be publicly punished, thus damaging their reputation (Donath & Boyd, 2004). Donath et al. contrast this with the online dating model, where users are connected one-on-one, making deception easy and frequent. While women are generally more concerned with impression management, both genders feel it is important that profiles be realistic (Haferkamp & Krämer, 2008). Though

sometimes the software application itself, not the user, affects the way in which one can self-represent. Social networks suffer from rigid profile structures that typically represent users unnaturally as consumers, classifying them by favourite singer for example (Marwick, 2005). Interestingly, even though users claim that they want to represent themselves as closely as possible to reality, they often do not trust the profiles of others—particularly if they have an above average physical appearance (Haferkamp & Krämer, 2008).

A review of literature by Leary and Kowalski (1990) conceptualizes impression management through a 2-part model consisting of impression motivation and impression construction. Impression motivation is the degree to which one is motivated to control other's perception of oneself. Impression construction identifies the type of impressions people construct given a set of factors. This model is particularly useful for understanding why impression management is important in an online setting (Leary & Kowalski, 1990).

Social networks provide individuals with a new way to connect with each other. Thus, it is important to understand how those connections will shape their impressions, and generally how that is changing in the online environment. The ability to comment on user profiles as well as display one's network of connections, makes the process of impression management online different than offline. Outsiders actively participating in other's profiles via tools such as comments, means that users have less control over their online impressions than they would in an offline environment. Further, because shared public connections serve as a mechanism for encouraging authenticity in profiles, one can predict individuals increasingly beginning to trust online identities—making impression management in an online social network environment highly relevant and necessary.

2.1.2 Network and network structure

One popular method of studying a social network and its structure is through social network analysis. Social network analysis focuses on the patterns of relations between units (whether that be groups, individuals, organizations or etc.) The method proposes a shift from analyzing the individual toward understanding the structure. Rather than exploring the age and sex of a participant for example, a structuralist would look at properties such as closeness or cliquishness of a friendship link, or perhaps the social exchange taking place. As such the unit of analysis becomes the tie or relation. (Garton, Haythornthwaite, & Wellman, 1997)

This form of analysis is not new however; online social networks have presented social network analysts with a world of opportunities as a result of digitizing the social content (Wasserman & Faust, 1994). Typically, in order to map a social network, researchers would have to conduct lengthy phone and in-person interviews to gather the information. An online computer network completes this task (Adamic, Buyukkokten, & Adar, 2003).

By way of being a method, social network analysis often occurs in tandem with other theories. One study looked at social networks through diffusion of innovation theory, with membership as the diffusing property. Questions in the study included: who joins networks, why networks grow, and how the information within networks changes. Through the use of data mining techniques and decision tree modeling methods they seek to explain features that would explain these phenomena. They find that membership based on network externalities suggests the law of diminishing returns—with more connections being made at the beginning. Further, network growth and information

changes are affected by how active the group is, community size, fringe, and how "hot" a topic is. (Backstrom, Huttenlocher, Kleinberg, & Lan, 2006)

One of the first large network studies analyzed the network structure of Flickr and Yahoo!360 in order to better understand network growth. Their analysis revealed three distinct network groups and three different types of network users. The typology of network users included passive members, inviters, and linkers (listed from least to most involved). Their group typology revealed that a majority of networks are comprised of star structures, which mirror the dynamics of innovation, with many users being invited, but only a core few participating more actively. They called the three groups: singletons who joined but never used the network; giant component who are a large interconnected group and; middle region who are the remainder. (Kumar, Novak, & Tomkins, 2006)

Other studies remain rooted a bit closer to social network analysis on its own. Golder (2006) used the notion of geography and population density to explain rank-based friendship. Mathematically the research proved that people who live close together, and have few people between them are more likely to have a higher-ranking friendship. Hsu (2007) used a graph mining method in order to differentiate features, which are characteristic of a network, a pair of users, or an individual. The concept posits that in order to identify potential relationships within a group, one must identify links, classify and annotate them.

Lastly, structural analysis is often used to explain social phenomena that may combine and inform different theoretical areas of study. A study by Lampe, Ellison, & Steinfield (2007) combined the study of impression management and network structure.

Here, profile information from Facebook, a social networking site, was gathered in order to analyze whether the completeness of a profile has any impact on the number of connections an individual has. The study was rooted in three theoretical frameworks. Signaling theory was used to assess whether the type of information (or signal) mattered. Common ground theory was the basis for motivations to fill out profiles. Finally transaction cost theory explained how the two combine to ease communication between connections. The study did conclude that populating fields was positively correlated with the number of connections.

In another example of network structure, Adamic (2003) used social network analysis in order to test a Stanford University network called Nexus. The study identified social network phenomena that contribute to friendship formation. An individual's position within the network was used to test the small world effect, clustering, and the strength of weakly tied individuals. It was found that users who were similar were more likely to be friends (even if they were only weakly tied). In addition individuals with more connections formed bridges within the networks, and were more likely to prevent cliques from occurring.

Studies involving network structure identify the benefits of studying the collective network as opposed to looking at individual actors. While social network analysis was a cumbersome process in the past, online social networks have digitized the network structure, making these studies accessible and increasingly popular. However, it is important that the generalizability of these studies onto the offline world is assessed as opposed to assumed—this is another area of online social network study.

2.1.3 Online versus offline networks

Thanks to the digitization of social networks in an online environment, sociologists can now study networks in new ways, bridging what we already know about social networks offline. In order to transfer this knowledge however, it is important to understand how online and offline networks may differ. Often studies treat these online networks like online communities, but social networks are not interest based in the same way (Wellman, 1997). As such, one area of study is to evaluate social network sites against offline networks.

Additionally, there have been concerns over the impact of these sites on one's offline networks. Here sociologists are aiming to understand whether participating in online social networking is a *social* activity, and whether it impacts an individuals' sociality offline. It has been found that in many cases online communities are replicas of people's everyday lives. As such online activities are dependant on offline identities (Hargittai, 2007) and users carry their offline identities over into their online interactions (Turkle, 1995).

Identifying the intricate differences between online and offline worlds is not easy. Hargittai (2007) identifies that the difficulty in studying these social networking sites is that they are different from each other, and in aggregate, may not be as predictive. Furthering the problem, studies on the impact of the Internet have also aggregated online behaviours, which does not allow for an understanding of online social networks specifically. How the sites are used is also dependant on gender, age, and other characteristics (discussed later). As a result it is difficult to generalize usage over the installed base (Lenhart, Madden, & Pew Internet & American Life Project, 2007).

As an example, in an ethnographic study of multi-user domains, (Turkle, 1994) found that playing online games becomes a part of the players' real lives; in fact often splitting their identities into two or more parallel persons that they manage. Others argue however, that rather than being parallel in nature, the lives users create online are more perpendicular to their offline environments—as such they intersect and are not separate (Thelwall, 2008).

The hope is that online environments will benefit our offline relationships. A study on the link between social capital and Facebook use, found that intensive use of the site does aid in maintaining friendships. Further, the relationships maintained online served to supplement their offline contact, especially in cases where friends became separated by physical distance (Ellison et al., 2007). As such, there seems to be a growing body of evidence that online social network sites may have a positive impact on our lives.

2.1.4 Privacy

Concerns of privacy with regard to online usage have been one of the more longstanding and widely researched topics across social media. One definition of privacy is "right of people to control what details about their lives stay inside their own houses and what leaks to the outside" (Garfinkel & Spafford, 2002). Closely tied to the concept of privacy are trust and intimacy. Arising from these concepts, and the current use of social network sites, many paradoxes can be observed and a discussion of them will follow. On the whole, they stem from society's willingness to share information freely, as a result of a lack of understanding. There are risks associated with this behaviour, particularly when examining the younger generation of users.

Many privacy studies are concerned with protecting children. In the case of the social network space, usage among the younger generation is especially important, as this generation is the first to grow up with this type of media. Where typically parents teach children socially appropriate behaviour, today teenagers are teaching themselves how to behave on social networks (Barnes, 2006). Thus, potentially harmful norms may be formed. Exposing too much information online puts young individuals at risk to anything from rumors at school to possible sexual predator attacks.

The privacy paradox, as described by Barnes (2006) stems from the actions taken by teens to reveal personal information, in opposition to the actions of adults attempting to stop the spread of private information. Barnes explains quite clearly "Adults are concerned about invasion of privacy, while teens freely give up personal information. This occurs because often teens are not aware of the public nature of the Internet" (Barnes, 2006). He continues to describe that sitting at home, privately writing a message, can have a deceiving feeling—for there is nothing private about posting that message to millions of users. From the example one can ascertain that privacy loss, is often at the hand of the user, who has willingly released the information and unknowingly put themselves at risk.

While parents worry about children divulging information online, one could ask why they do so in the first place? In offline situations, individuals give out private information to those they trust. Just like people have different levels of trust with different friends, websites also have different trust levels. Interestingly, low trust values don't always translate into more concern for privacy, therefore we do not understand this

relationship fully—possibly pointing to the fact that society is willing to belong to a network of millions without feeling threatened. (Dwyer, Hiltz, & Passerini, 2007)

While trust online is not high, trusting someone is an intimate experience. Thus, once again paradoxically revealing private information online may yield unexpected results in friendship—leading to many acquaintances as opposed to *true friends*. This again goes back to the amount of information one reveals. A study of 4000 Facebook users at an American university showed shocking amounts of information being disclosed with "90.8% of profiles contain an image, 87.8% of users reveal their birth date, 39.9% list a phone number (including 28.8% of profiles that contain a cell phone number), and 50.8% list their current residence." (Gross & Acquisti, 2005)

With the amount of information disclosed the risk of exploitation begins to emerge. In a majority of the cases users have themselves to blame for releasing these cyber personas into the world. A vast amount of information hosted on the Internet is provided directly by users. The only way to stop the exploitation of such data is for users to exercise caution—this does not seem to however be a concern for young individuals today. (Rosenblum, 2007)

From a professional perspective, the younger generation needs to be conscious that creating long lasting digital personas today, can have negative outcomes in the future. Already employers *Google* potential candidates as a method of screening. A July 2006 survey US National Association of Colleges and Employers found that 27% of employers have *Googled* their job candidates or checked their profiles on social networking sites (George, 2006). In social networks individuals who can access a user's

profile can impact that person's reputation. Employers could judge an individual based on posts made by friends or potentially explore beyond the individual's profile into others in their network (Rosenblum, 2007). This is particularly important because social networks reduce our connections to binary forms (friends or not), thus putting the whole network on the same plane, and missing the degrees of closeness one would gain in real life (Gross & Acquisti, 2005). The result can be, not getting a job over something written by an almost complete stranger.

While there are growing concerns over privacy, particularly when it comes to young individuals, users are willing to post more and more private information online. This could stem from the lack of understanding that while a social network may feel small and private, shared between friends, it is actually millions larger. The ideals of privacy are changing, and we are adapting as a society in the future. Longitudinal studies will shed interesting perspective on whether today's young people regret posting so much private information online.

2.1.5 Socio-demographics

One area of investigation is social network research is describing the users' socio-demographic characteristics and evaluating their impact on usage. Common areas of study include the impact of gender, age, race, and religion.

One study on social network sites and gender has found that teenage girls have more friends/contacts. The language they use in their profiles is also more social and self-reflective than that of males (Arjan, Pfeil, & Zaphiris, 2008). Research on MySpace has found that females use recreational networking sites to make friends, while males are more interested in finding romantic partners. As a result, there is a preference on the sites for female users (Thelwall, 2008).

Studies on age have found interesting results. Often these sites are seen as being characteristically *young*. Sites like Facebook however, report that their fastest growing demographic is those 35 and older (Facebook.com). On average younger users have a greater number of connections; with a majority of those connections being around the same age (+/- 2 years). Older individuals on the other hand have fewer connections, but those they do have are more age diverse (Arjan et al., 2008).

Race and religion have also been of interest in these digital networks. A study by Nyland (2007) explored the uses of Facebook in relationship to the religiosity of an individual. A positive correlation was found between those users who were more religious and the use of Facebook to maintain friendships and find out about social events. Further, it was found that students sharing social relationships as well as demographic traits tend to share a significant number of cultural preferences (Lewis, Kaufman, Gonzalez, Wimmer, & Christakis, 2008). While one could hope that these social networks decrease boundaries between individuals, be it racial, physical or etc. some sites have been creating and defining borders and identifying distinct identities (Byrne, 2007).

3 Focus of the study

In this thesis online social networks are assessed through the lens of social capital theory. Prior to an investigation of current work in online social networks and social capital, it is important to further explore this theoretical background. Social capital has very much become a highly heterogeneous umbrella-concept used in many contexts (Adler & Kwon, 2002). As such, it is essential that I position the context within which it is used here. This follows in the key concepts and definitions section.

The definition used to anchor this thesis posits that social capital can be defined in the simplest terms as an investment in social relations with expected returns (Lin, 2001). Meaning, building social capital takes work, investing time, effort, and possibly even money to build up social capital. This capital can then be used, like an asset, to pursue opportunities not accessible to the individual without his or her network. This view is rooted in the work of Bourdieu, who identified that having more social capital is positive as well as presenting a challenge, usually stemming from social class. He recognized social capital as "the aggregate of the actual of potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu, 2001). However, this is only one of many views of social capital. The key concepts section describes other contested topics in social capital such as: multi-dimensionality, the type of social capital, and level of assessment.

Once these concepts are detailed, the position taken on each is identified. Lastly, a review of social capital research in online social networks thus far is presented. Due to the limited literature that combines the field of social capital and online social networks,

an investigation of the relationship between information communication technology (ICT), the Internet and social capital allows for a broader perspective on the field of study. Thus further anchoring the theoretical framework in a more specific body of knowledge.

3.1 Key concepts and definitions

In order to situate social capital for this thesis I now explore the evolution of social capital, and describe the different schools of thought associated with the concept. I begin with a discussion of dimensionality, followed by different types of social capital, and different levels of study.

3.1.1 Dimensions of social capital

Social capital is a multi-dimensional concept, which requires researchers to identify the lens with which they are studying it through. There are common dimensions within social capital, which alone stand incomplete. For example rules and norms, network resources and trust are all individual dimensions (Claridge, 2004). Rather than choosing one of these dimensions, there are researchers who have tried to address this dimensionality overall. Table 2 identifies some authors who developed dimensions of social capital.

Table 2: Dimensions of social capital

(Woolcock & Narayan, 2000)	• Communitarian view • Network view • Institutional view • Synergetic view
(Narayan & Cassidy, 2001)	• Group characteristics • Generalized norms • Togetherness • Everyday sociability • Neighbourhood connections

	• Volunteerism
	• Trust
(Onyx & Bullen, 2001)	• Trust
	• Social Agency
	• Tolerance of diversity
	• Value of life
	• Community connections
	• Neighbourhood connections
	• Family and friends connections
	• Work connections
(Liu & Besser, 2003)	• Informal social ties
	• Formal social ties
	• Trust
	• Norms of collective action

The work of Woolcock and Narayan is seminal as they provide a highly complete and simple set of four approaches to social capital. The main ideas within these dimensions will now be discussed.

3.1.1.1 Communitarian View

The communitarian view of social capital identifies with local organizations such as clubs, associations and civic groups. Woolcock et al. explain that communitarians such as Putnam and Fukuyama, posit that the number of these groups and their density are a measure of social capital. Additionally, they believe that social capital is *good* and thus the more of these groups exist in a community the better. One criticism of this view is that where social capital is inherently good and always has a positive impact on the welfare of a community, the negative side of social capital is ignored. Portes and Landolt (1996) posit that communities are largely homogeneous and isolated, and as such can turn productive social capital to perverse social capital, which hinders development. Examples of this are ghettos or gangs in communities. Further, communitarians believe that homogeneity of the group resultantly benefits all of its individuals. Inequality, ethnic

exclusion, and gender discrimination suggest otherwise (Narayan & Shah, 2000).

3.1.1.2 Network View

Unlike communitarianism, the network view of social capital does identify that it has upsides and downsides. This view emphasizes the importance of vertical and horizontal relationships. Much of this approach is rooted in the work of Granovetter (1973) who explored the benefits and drawbacks of close relationships, which he called strong ties, and more loosely tied relationships, which he called weak ties. Weak ties traditionally exist between colleagues and acquaintances and strong ties between close friends and kin. The existence of these ties are not always categorized by those sets of relationships, but rather by various measures such as: frequency of contact, closeness, intimacy and reciprocity (Putnam, 2000).

Granovetter identifies that while it may be natural for us to think of our strong ties as those most valuable, it is weak ties that have more immediate embedded resources. Information travels within groups quickly, however requires links (or what Burt (1992) calls bridges) to spread. Weak tie relationships allow us to make those connections outside of our social circles or cliques. Thus, individuals with many weak ties will have access to more information and opportunities. (Granovetter, 1973).

In recent literature these weak and strong tie relationships have become known as bridging and bonding social capital. Network theorists have identified that a balance of the two is necessary for successful individuals or communities to exist(Woolcock & Narayan, 2000). In addition to the type of relationship that exists, other factors, which

contribute to this view are a person's position within a network, as well as network closure.

Network position has been echoed as an important characteristic of social capital in the work of Coleman, Putnam and Bourdieu. Burt (1992) identifies that were groups are weakly connected there are opportunities for holes in the network. He calls them simply structural holes. Individuals who span the holes then have a structural advantage of circulating in different flows of information. These positions are referred to as brokers (of information) or bridges (spanning the holes). Thus, holding the bridge positions near structural holes is advantageous from the social capital perspective. We recognize these individuals as seemingly being involved in a large variety of activities. (Burt, 1992; Burt, 2001)

Closely related to, and sometimes opposing, network position is the argument of network closure. Closed networks have densely knit membership, making individuals highly accountable for their actions. They build relationships of trust, and form norms. One can see applications of accountability in high-risk job environments that work with teams. The team members must trust each other, as well as have a way to recognize when someone is behaving in a way that is not appreciated by the group. Researchers agree that network closure or density is a reality for networks. Whether it is positive or negative however, seems highly contextual and debated by researchers. (Coleman, 1988; Morgen & Sorensen, 1999)

3.1.1.3 Institutional View

The institutional view, as its name would suggest, largely resides in the study of social capital from an institutional perspective. Here social capital is a dependent variable, with community success being a product of political, legal, and institutional environments. Much of the research done in the area addresses social capital from a macro rather than a microeconomic perspective (Claridge, 2004). As such, one of its drawbacks is a tendency to look at the impact of government, ignoring its ability to give individual (micro) rights and freedoms (Woolcock & Narayan, 2000).

The view has two variations. The first uses case studies to demonstrate that where government encourages community or economic growth, civil society is more successful. The second is comprised largely of quantitative cross-national studies that interrogate the impact on government performance on social or economic success. The work of Knack and Keefer (1997) is seminal to this approach. The two have created indexes, with various measures that measure the impact that social capital has on poverty, concluding that it decreases, or in the very least does not worsen, a society's well being. Thus the two views come to similar conclusions, identifying that the more efficient and stable government free from corruption and inequality, the less impediments it causes to the prosperity of a society (Woolcock & Narayan, 2000).

3.1.1.4 Synergy View

The synergy view is an intersection between the networks and the institutional views of social capital. Woolcock and Narayan, themselves subscribe to this view. The premise of this approach is that it is important to understand the relationships between society and government in order to know the outcomes associated with different combinations of bridging and bonding relationships between them. As such social capital is a mediating variable in the synergy view. Public and private institutions shape social

capital, however social capital in turn has the ability to impact developmental outcomes. (Woolcock & Narayan, 2000)

The above-discussed four views for conceptualizing the multidimensionality of social capital created by Woolcock and Narayan (2000) broadly categorizes social capital literature into four views. In the community view of social capital the research operates under the guise of social capital being positive, suggesting the more the better—in effect ignoring the drawbacks. The networks view on the other hand sees social capital through the types of relationships held by individuals, and the characteristics of their network. Here the network has important implications on a micro individual level as resources reside in the relationships. The third view is the institutional view, which posits that institutions such as government need to perform, in order for civil society to succeed. Here social capital is seen as the dependant variable. Lastly, the synergy view combines pieces of the networks and the institutional views of social capital. As such social capital becomes the mediating variable where it is shaped by public and private institutions and in turn has the ability to impact developmental outcomes. Given the different positions that social capital can take on, it can be seen that positioning one's work is an important step when using social capital as a theoretical framework. I will continue to further position this thesis within the literature, clearly outlining my approach in section 3.2.

3.1.2   Types of social capital

The attempts to conceptualize the different dimensions of social capital have converged to the identification of different types of social capital. While there are many typologies within the different dimensional approaches, two highly popular typologies are structural and cognitive, as well as bridging and bonding.

28

3.1.2.1   *Structural and Cognitive*

The structural and cognitive framework for social capital was developed by Uphoff and Wijayaratna (2000). Here the researchers identify that structural social capital is objective while cognitive social capital is subjective. Structural social capital facilitates information sharing and collective action emerging from roles and social networks, facilitated by rules, procedures, and precedents. Cognitive social capital refers to shared norms, values, trust, attitudes and beliefs. Thus, structural capital is more external, while cognitive is more internal to the individual (Krishna & Uphoff, 2002). Further, the two types are not necessarily mutually exclusive. For example helpful behaviour between neighbours can occur on the basis of a cognitive bond rather than the structural arrangement of living next to each other (Grootaert & Van Bastelaer, 2002a).

Grootaert and Van Bastelaer (2002) build on this typology by identifying that there are macro and micro dimensions in social capital, and the cognitive versus structural types can be seen along a continuum thus identifying the different areas of research within social capital identified within the quadrants of Figure 1.
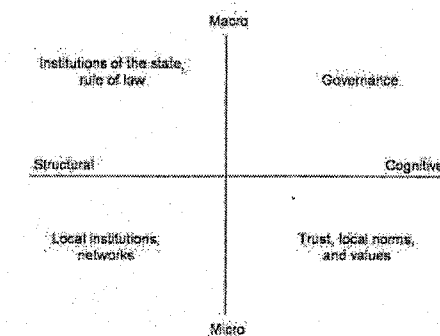
Figure 1: Conceptualization of social capital developed by Grootaert and Van Bastelaer (2002)

29

3.1.2.2 *Bonding and Bridging*

The concept of bonding and bridging social capital is initially offered up by Putnam, in attempt to qualify that social capital is not *all* positive; and that some types of social capital are *better* than others. Namely that bonding is for 'getting by' while bridging is for 'getting ahead' (Leonard, 2004). A bonding tie can be understood as an intra-community close tie, while a bridging tie represents an extra-community weak tie. From the perspective of the individual this typology closely relates to the work of Grannovetter, where weak (bridging) ties commonly exist between acquaintances and strong (bonding) ties typically exist between family and friends. (Grannovetter, 1973)

Putnam identified bonding ties as narrow, with limited benefits for the internal group only. In the work of Putnam, Coleman, and Grannovetter, bridging ties are seen as a superior and more productive form of capital. Much of the benefits associated with forming bridging ties are explained by network view researchers. For example in the work of Burt (1992), a bridge is an individual linking two groups together. The premise is that social capital is most profound when the relationships are heterogeneous, as this allows for a diverse set of resources and opportunities (Narayan & Cassidy, 2001).

Narayan (2002) identifies that bonding ties within a group may help individual members, however without bridging ties across to other groups, those members are excluded. She calls bridging ties cross-cutting, identifying that they bare economic opportunities and improve social cohesion. Narayan goes on to identify the success of government given differing amounts of these cross-cutting ties. In studies of community, bridging or horizontal bonds, have been shown to influence public services, better cooperative action, increase information sharing, increase community efficiencies and

provide an informal insurance (Narayan & Pritchett, 1999). One study of Tanzanian households, Narayan et al. (1999) finds that families with higher social capital, measured through group membership, were more innovative and overcame market failures more effectively.

In addition to being helpful to entire groups, some authors suggest that the true strength of bridging ties is that they are capable of benefiting not only the community, but also the individual. In fact, some argue that as individuals in communities make leaps from bonding social capital to bridging social capital, it is the individuals that benefit, rather than the community as a whole. (Leonard, 2004)

3.1.3 Levels of social capital

The last point of divergence within the literature is the level at which social capital is assessed. While some researchers identify social capital as occurring at the individual level, others claim it to occur at the level of community, society, or some hybrid of them all (Claridge, 2004). Coming from the networks view, Adler and Kwon (2002) suggest that social capital resides within the individual's social structure. The result is that social capital can belong to and be used by the individual or the group within which the individual resides.

Much of the research views social capital at a community rather than an individual level stemming from the arguments posited by Coleman (1988) who states that unlike human capital, social capital resides within the social structure. There is consensus however that one can identify social capital occurring at several levels. These include

macro (societal), meso (group), and micro (individual) levels. Moreover the goods produced by social capital can also be interrogated and observed on these different levels.

Some researchers argue that depending on the level of assessment, social capital can be either a public or a private good (Aldridge, Halpern, & Fitzpatrick, 2002; Onyx & Bullen, 2001). Some understand it to be a public good only (Coleman, 1988). Others believe that it is in fact a private good. Fukuyama, Reforms, & Democracy (2002) advocate that while the nature of social capital is private, it bares many externalities both good and bad.

3.2   Position of theoretical framework within social capital research

The literature demonstrates that social capital is a multi-dimensional concept. These dimensions have lead to the development of a categorization of different types of social capital. As such, even the definition of social capital is dependent on factors such as discipline and level of organization (Robison, Schmid, & Siles, 2002). The definition anchoring this research posits that social capital is as an investment is social relations with expected returns (Lin, 2001). Given social capital can be such a broad topic, it is important to situate the concept, and how it is being used here.

The view of social capital I adopt is the networks view, as the relations between individuals, and the resources they carry are central to the research questions. It is within this view that the concepts of bonding and bridging social capital are introduced. The bonding and bridging framework also identifies the two types of social capital being investigated here. Lastly, the analysis is egocentric, meaning it occurs at the level of the individual. It is not the intention to assert that social capital and the goods it produces

cannot belong to the group. Rather it is the intention to identify how an individual contributes to this collective, regardless if it is for group or individual benefit. A review of social capital theory research within social networks, ICT and the Internet follows.

3.3   The Impact of ICT and the Internet on Social Capital

Given that online social networks are quite new, it is useful to broaden the scope and investigate the impact of the Internet on social capital. Here Quan-Haase and Wellman (2004) poignantly identify three schools of thought:

1) The internet decreases social capital: the internet provides solitary entertainment that draws people away from family and community
2) The internet transforms social capital: the low cost of the internet is leading to less spatially bound groups
3) The internet supplements social capital: the internet extends our ties to new forms of communication, providing additional points of contact (Quan-Haase & Wellman, 2004)

There is also the possibility of looking at this concept in reverse; to identify what effect social capital has on Information and Communication Technology (ICT) usage. For example, one study found that the existence of social capital lead to positive attitudes about Internet use (Borgida et al., 2002). There are a number of other studies that investigate ICT in the context of relationships—whether they are sustained, created, and what types of relationships emerge. These studies are rooted in the work of Grannovetter and Putnam, drawing on the concepts of weak (bridging) ties and strong (bonding) ties. Most studies agree that the Internet has positive effects on both strong and weak ties (Blanchard & Horan, 1998; Ferlander & Timms, 2001; Kavanaugh, 1999; Pinkett & O'Bryant, 2003). On the other hand, there are studies that show that only strong ties are

augmented (Meredyth, Hopkins, Ewing, & Thomas, 2002). Most generally, there seems to be consensus however, that ICT usage has the ability to supplement whatever type of tie existed beforehand (Haythornthwaite & Wellman, 2002). Even here however, the definitions between ties differ, making it difficult to draw broad inferences. A brief discussion of each of the three schools follows.

Studies indicating that Internet use decreases social capital are typically referring to the traditional concepts around social capital for a society as a whole. For example, as a result of spending time online, people are drawn away from spending time with their families (Nie & Erbring, 2000; Nie, 2001). Some researchers compare time spent online to television watching patterns (Putnam, 2000). This however is no longer commonly accepted as a form of comparison because the Internet is much less passive, as well as offering the ability to be social (Quan-Haase & Wellman, 2004). This traditional view of socializing can potentially be ignoring the new ways in which we interact, particularly in the online social network environment.

Some researchers have inferred that the Internet transforms social capital. Because the Internet is cost effective, easy to use, and provides a variety of tools, its impact can be seen as positive. Further, the Internet bridges physical distances between individuals, allowing much further-reaching communities to exist (Wellman, Haase, Witte, & Hampton, 2001). At the same time, it also allows users to group themselves according to interests, fueling community growth (Baym, 1993). There also exists the possibility for socio-demographic barriers to be reduced online (Sproull & Kiesler, 1991). In this view of the impact of online activities we come to understand that perhaps social capital is not diminishing in North America, but rather changing form—with online

communities replacing face-to-face communities (Quan-Haase & Wellman, 2004).

Lastly, some researchers identify that the Internet does not impact the social capital that already exists, but rather supplements its existence. Here the Internet is seen simply as yet another way to keep connected. Thus, if individuals do not often contact friends, the Internet would not change this behaviour dramatically. Likewise, if someone spoke on the telephone often, it is likely that they also connect through email often. The Internet is just another media that facilitates these interactions. (Haythornthwaite & Wellman, 2002)

3.4 The Impact of online social networks on Social Capital

We have previously identified that drawing inferences on the state of social capital in relation to Internet usage is not highly valuable, as there is a broad scope of activities one can choose to engage in online—some more social than others. Thus, collapsing activities that range from playing video games to reading the news, to emailing is a mistake (Baym, Zhang, & Lin, 2002). As such breaking down the Internet into specific uses is more constructive. In the context of this research, the impact of online social network sites on social capital is most relevant.

Given that social network sites are a new technology, there are not many studies presently published in the area, especially when compared to studies of the Internet as a whole. Much in the same way that we have identified that the Internet as a unit of measure is too broad, it is also important to note that research in online communities cannot be generalized to social network sites. Online communities are interest based, while online social networks are more egocentric in nature. (Wellman, 1997)

Studies investigating online social networks and social capital specifically, have found that there is a positive relationship between the two. One study of Facebook, found that there is a positive relationship between the intensity of Facebook use and social capital. Further, the relationships maintained online serve to supplement one's offline contacts, especially in cases where friends are separated by physical distance (Ellison et al., 2007). This is in line with earlier studies about communities supported by online networks, such as the Netville community in Toronto (Hampton, 2003). More currently another study also supported this premise. Here social capital was measured using dimensions described by Putnam, which include life satisfaction, social trust, civic participation and political engagement. The study explains that the positive relationship between social networks and social capital, though not exceptionally strong, shows that online social networks do not cause isolation as often quoted in mainstream media, but rather contribute to social capital. (Valenzuela et al., 2008)

Interestingly, in the latter study the only socio-demographic variable that was moderating was race, with gender, age and family background having no impact on the relationship. Encouragingly the minorities in this study achieved greater gains from the site. Similarly, Ellison (2007) found that students with low self-esteem experienced reduced barriers to participation. Lastly, the positive relationships between intrapersonal social capital dimensions was stronger than that of the interpersonal ones, showing that online social networks have varying impact on different social capital dimensions (Valenzuela et al., 2008).

Another type of study, (Lampe, Ellison, & Steinfield, 2006) investigated whether Facebook was used for social searching or social browsing. Social browsing is described

as looking for online connections that can be transferred offline, while social searching is finding out more about offline connections in an online environment. Firstly, the study identified that users felt their profiles accurately represented them, and that these representations were positive. Secondly, the results of the research indicated that students largely used Facebook for searching rather than browsing.

These studies show a promising future for social capital research within the online social network space. This thesis contributes to this area of research. In addition I hope to address another hurdle of this field—a lack of appropriate measurement scales. More specifically it is an opportunity to utilize some recently developed scales to further their strengths as a tool. In his study, Williams (2006) creates two sets of scale for bonding and bridging social capital. The scales are rooted in the work of Putnam (2000). Williams uses: outward looking; contact with a broader range of people; view of oneself as part of a broader group; and diffuse reciprocity with a broader community; as indicators of bridging social capital. Emotional support, access to scarce or limited resources, ability to mobilize solidarity and out-group antagonism are used to predict bonding social capital. These scales are used in this thesis and will be described more thoroughly in Chapter 5.

3.5 Theoretical Framework for the research

The theoretical framework for this research is a combination of concepts from social capital theory and technology acceptance theory. Within the broad range of social capital topics this research uses two frameworks; the bonding/bridging framework and the searching/browsing framework. These frameworks are appropriate because they combine types of relationships or ties with types of behaviours typically leading up to the existence of those ties, respectively. Along with these two constructs, the research also

includes the ease of use framework, stemming from the technology acceptance model. (Davis, 1989)

Research on the impact of the Internet is divided into three schools of thought with regards to social capital—the Internet is seen to either increase, decrease or supplement social capital (Quan-Haase & Wellman, 2004). Online social network research is not as clear in this regard because too few studies currently exist in the area. As such this research contributes to this new and developing area of knowledge. Given that so far scholars agree that social network sites have the ability to support social capital, this thesis explores contributing factors using a new combination of three theoretical frameworks. An explanation of each follows.

3.5.1 Bonding and bridging social capital

I have already introduced the bonding and bridging framework of social capital in section 3.1.2.2 discussing different typologies of social capital. The bonding/bridging framework was popularized by Putnam (2000), a seminal author in social capital research. Bridging social capital occurs among larger, inclusive groups of members who typically describe themselves as acquaintances or co-workers for example. It is important because it allows networks to span across and connect to other networks. Burt (1997) calls these connections bridges. In doing so, additional information can flow across the bridge, and the network becomes richer. Bonding social capital, on the other hand, describes the types of relationships that exist between close friends and family. Bonding networks are typically homogeneous in nature, connecting people from similar backgrounds, used to offer emotional support. Both types of capital have a useful purpose in a person's life. (Putnam, 2000)

38

Putnman's organization of these two types of social capital is derived from the concept of different tie strengths, originally articulated by Granovetter (1973) in the Strength of Weak Ties Theory. There are two basic types of ties that can be attained: weak ties which map to bridging social capital and strong ties which map to bonding social capital. The existence of these ties is not always categorized by those sets of relationships, but rather by various measures such as: frequency of contact, closeness, intimacy and reciprocity. (Putnam, 2000)

Granovetter (1973) identifies that while it may be natural for us to think of our strong ties as those most valuable, it is weak ties that have more immediate embedded resources. Information travels within groups quickly, however requires spreading. Weak tie relationships allow us to make those connections outside of our social circles or cliques. Thus, individuals with many weak ties will have access to more information and opportunities. Putnam further highlights the benefits of bridging social capital as capital used for 'getting ahead'. (Putnam, 2000) As such, the focus of this thesis is on bridgingsocial capital.

The use of the bonding and bridging framework in the context of social networks is appropriate for several reasons. Most research on the impact of the Internet use on social capital pertains to the types of social ties created. Studies have shown that age impacts the type of tie created, with younger individuals creating more bridging ties, and seniors more bonding ties for social support (Kavanaugh, 1999). Other studies indicate that networked communities can positively influence both strong and weak ties (Ferlander & Timms, 2001; K. N. Hampton & Wellman, 2000; Pinkett & O'Bryant, 2003). This concept can be extended further to say that the Internet is most productive at

39

forming weak ties (Ellison et al., 2007), though the quality of those online ties may be more fragile than its offline predecessor (Haythornthwaite & Wellman, 2002). While weak ties have been the focus of Internet research in general, strong ties are a construct we see often in virtual communities, because of their purposeful nature to pursue a common goal, typically oriented around a common interest (Preece, 1999). While social networks have the ability to capture both weak and strong ties however theoretically they seem to be better equipped to exploit bridging ties.

Secondly, the bonding/bridging framework is appropriate for this research because it is the only framework that has been developed and empirically tested directly in the context of social network research. Williams (2006) has developed sub-scales, which can be used to measure social capital in the social network context. An adapted version of the scales has been used in a study to determine the types of social capital that exist on Facebook (Ellison et al., 2007). Williams has constructed this type of measure in response to Putnam, who writes "I have found no reliable, comprehensive, nationwide measures of social capital that neatly distinguish 'bridgingness' and 'bondingness'" (2000, pp. 23-24). Thus, it is valuable to further continue to develop the predictive value of bonding/bridging online.

3.5.2 Searching vs. Browsing

The social searching versus social browsing framework broadly categorizes the way in which participants use social networks. It explains, "Social searchers would use the site to investigate specific people with whom they share an offline connection to learn more about them. Social browsers would use the site to find people or groups online with whom they would want to connect offline" (2006, pp.1). The study identifies that

Facebook is primarily used as a social searching tool, connecting offline friends. One could infer however, that a technology that is used to grow social capital would have to support social browsing. These browsing results in turn would likely initially create bridging ties (Lampe et al., 2006).

The concept of social browsing is not new—it was also introduced by Root (1988). Here he identifies that social browsing is part of the *social interface* in Computer Supported Cooperative Work (CSCW). He writes "We use the term "social browsing" to describe this dynamic process of informal, in-person, mobility-based social interaction. We suggest that social browsing is a fundamental mechanism for developing and maintaining social relationships in the workplace" (1988, pp. 27). We know that work relationships are typically weakly tied, and that those ties are highly valuable in the workplace (Granovetter, 1973).

The searching/browsing framework has made inroads to understanding how people are using online social networks. Given that bridging social capital formation is possible through the use of online social networks, we can interrogate which behaviours help individuals achieve this task. As such we are able to test whether the uses of social networks that Lampe et al. (2006) identify as social browsing behaviour, help predict bridging social capital formation online.

3.5.3 Ease of use

While the social searching/browsing model will help us understand the impact of user motivations on social capital formation online, ease of use, emerging from the Technology Acceptance Model (TAM), is used to investigate the characteristics of the

website (the technology) that may contribute to forming bridging social capital. TAM posits that usefulness and ease of use will impact the behavioural intention to use an information system as well as its actual use. A study by Davis (1989), a seminal author in the field, identifies scales to measure both ease of use and usefulness.

Davis (1989) describes perceived ease of use to be "the degree to which a person believes that using a particular system would be free of effort" and usefulness as "the extent to which people feel that a system will help them do their job" (1989, pp.320) It also suggests that ease of use may be an antecedent to usefulness, is such a way that there is a causality chain starting with ease of use, followed by usefulness, and finally usage. In this study we adopt the first link of that chain as a construct to identify the technological impact of use on creating bridging social capital.

There are two important assumptions that are implied, which make the use of TAM appropriate. Firstly, social networks function more like applications than they do traditional websites, because you use them as opposed to just read them for example. In fact, the Internet in general is becoming more like a set of applications that assist in completing a task (Pilgrim, 2008). For example, online communities have been identified to function as internet-based information systems (Wachter, Gupta, & Quaddus, 2000). While, traditionally, TAM has been very popular for testing IS systems such a Management Information Systems, its use has been extended to the Internet as well.

Several studies have shown TAM as an appropriate tool in Internet research. Morris and Dillon (1997) used TAM to test the acceptance and use of Netscape, an Internet browser, finding that ease of use predicts usage.(Teo, Lim, & Lai, 1999) studied

Internet usage through the lens of the TAM model.. While the results did confirm that ease of use directly and indirectly affected Internet usage, the variances were not well explained using TAM. The lack of success was explained by the novelty of the Internet, and people's attitude toward it being an entertainment rather than work technology. Given some of those differences Lederer, Maupin, Sena, & Zhuang (2000) extended the TAM model to include antecedents of the constructs, finding that the ability to easily find and understand information impacted ease of use. Others have extended the model to include other hedonic website properties such as visual attractiveness(Mahlke, 2002; Van Der Heijden, 2001).Given the parsimony of the model, and its success in other fields, it is beneficial to continue to explore its use in this way.

Secondly, while usability studies are beginning to emerge in the space of social networks, these concepts have not been empirically tested in this environment (Pilgrim, 2008). Ease of use offers a set of validated constructs, which is beneficial here as other components of the model are more experimental. I use the six indicators of ease of use, as validated by Davis (1989). They include: if the system is easy to learn, controllable, clear and understandable, flexible, easy to gain skill and easy to use. Not only is ease of use beneficial because it has been empirically tested many times, it also offers a very successful set of scales with the predictive value being 94%.

Thus, ease of use is a validated construct, which is a valuable extension into the social network environment. This is appropriate because it furthers TAM Internet research. Given that the Internet, and social networking in particular is being used more like an information system, understanding usage through the lens of TAM, and in this case ease of use is beneficial. As such, it is appropriate to extend ease of use to study

online social networks.

3.6 Operationalization of the concepts

This research brings together several constructs from different disciplines, which must be operationalized. The data is gathered using the survey method explained in Chapter 5. The three frameworks being used already have validated constructs in the form of survey questions. As such, only small modifications are made here in order for the constructs to fit the study.

First, the bonding/bridging scales are operationalized using the Internet Social Capital Scales (ISCS) proposed by Williams (2006). Using exploratory factor analysis, Williams develops 10 item scales for measuring bonding and bridging social capital. His original set of questions is developed from the work of Putnam, who identified qualities leading to different types of ties. Tables 3 and 4 show the initial quality identified by Putnam and the question that represents it in the ISCS scale.

Table 3: Theoretical concepts leading to bonding social capital

Theoretical Concept	ISCS Question
Emotional support	There are several people online/offline I trust to help solve my problems. There is someone online/offline I can turn to for advice about making very important decisions. There is no one online/offline that I feel comfortable talking to about intimate personal problems. When I feel lonely, there are several people online/offline I can talk to.
Access to scarce or limited resources	If I needed an emergency loan of $500, I know someone online/offline I can turn to. The people I interact with online/offline would put their reputation on the line for me. The people I interact with online/offline would be good job references for me. The people I interact with online/offline would share their last dollar with me.
Ability to mobilize solidarity	I do not know people online/offline well enough to get them to do anything important. (reversed) The people I interact with online/offline would help me fight an injustice.
Out-group antagonism	Confirmatory factor analysis did not find any significant questions in this category

Table 4: Theoretical concepts leading to bridging social capital

Theoretical concept	ISCS Question
Being outward looking	Interacting with people online/offline makes me interested in things that happen outside of my town. Interacting with people online/offline makes me want to try new things. Interacting with people online/offline, makes me interested in what people unlike me are thinking. Talking with people online/offline makes me curious about other places in the world.
Feeling contact with a broader range of people	Interacting with people online/offline gives me new people to talk to Online/offline, I come in contact with new people all the time.
Viewing oneself as part of a broader group	Interacting with people online/offline makes me feel like part of a larger community. Interacting with people online/offline makes me feel connected to the bigger picture. Interacting with people online/offline reminds me that everyone in the world is connected.
Diffusing reciprocity with a broader community	I am willing to spend time to support general online/offline community activities.

The second framework used in this thesis is the searching and browsing framework. This framework was also operationalized through exploratory methods. Lampe et al. (2006) use a survey to determine the uses of Facebook, which arethen categorizes into searching and browsing behaviours. The key differentiating factors between the two types of behaviours is whether the contact existed online or offline first. Thus an example of a searching behaviour would be "Keeping in touch with old friends" and an example of browsing behaviour would be "Getting information about people in my industry".

For this study the constructs are modified to reflect a more professional context (because LinkedIn, the online social network being tested, is largely for professional use). Secondly, measures that are thought to be indicative of new, bridging ties, are added. The original framework does not have many browsing behaviours listed, perhaps because the purpose of Facebook is largely to "search". The purpose of LinkedIn on the other hand, is to create opportunities for new connections—thus more closely tied to "browsing".

Table 5 identifies the constructs created using the searching and browsing framework. The focus of this thesis is bridging social capital, which closely aligns with browsing behaviours. As such, while I operationalized the entire framework, the model currently utilizes the browsing construct. The reasoning for this approach is further discussed in Chapter 5.

Table 5: Operationalization of the social browsing and searching construct

Social browsing:
• SBPI: Getting information about people in my industry
• SBJC: Searching for potential job candidates
• SBJO: Searching for potential job/business opportunities
• SBFF: Having a face-to-face encounter with someone I was introduced to on the website
Social Searching:
• SSND: Finding people to date
• SSKT: Keep in touch with old friends and colleagues
• SSNS: Check out new people I met socially
• SSNP: Check out new people I met professionally

The last framework to be operationalized is ease of use. Ease of use has been previously validated, with a large body of research confirming the value of the six original constructs defined by Davis (1989). The core six identified in Table 6 is used for

this research without changes. Two constructs—"It is easy to meet people I've never met before using the website" and "It is easy to find and add my contacts to my network" were added in order to help differentiate between the possibility of ease of use impacting bridging or bonding social capital respectively.

Table 6: Operationalization of ease of use

ELRN: It is easy to learn how to use the website.
EOU: Overall, I find the website easy to use
ECTRL: I find it easy to get the website to do what I want it to
EUND: My interaction with the website is easy for me to understand
EFLX: The website is rigid and inflexible to interact with
ESKL: The website behaves in unexpected ways
EBRDG: It is easy to meet people I've never met before using the website
EBND: It is easy to find and add my contacts to my network

3.7 Hypotheses

This thesis brings together three theoretical frameworks in order to build a model that is able to predict the variance in bridging social capital on LinkedIn. The purpose of LinkedIn is to uncover ties and bring new opportunities to individuals—both very much in line with the Strength of Weak Ties theory from Grannoveter, and bridging social capital from Putnam.

This is the first attempt to measure bridging social capital formation on LinkedIn, thus making the research highly exploratory. One of the principal challenges in this research has been selecting variables, which contribute to bridging capital. Testing the model allows us to see the amount of variance in bridging capital that is explained by the 3 selected variables. Each of these hypotheses will be discussed using the data gathered for the research.

The proposed model in Figure 2 consists of three theoretical hypotheses individually discussed below.

- H1: An individual's bonding capital will impact his/her bridging capital
- H2: Browsing behaviours will impact an individual's bridging capital
- H3: Ease of use will impact an individual's bridging capital

Figure 2: Model of factors contributing to bridging social capital
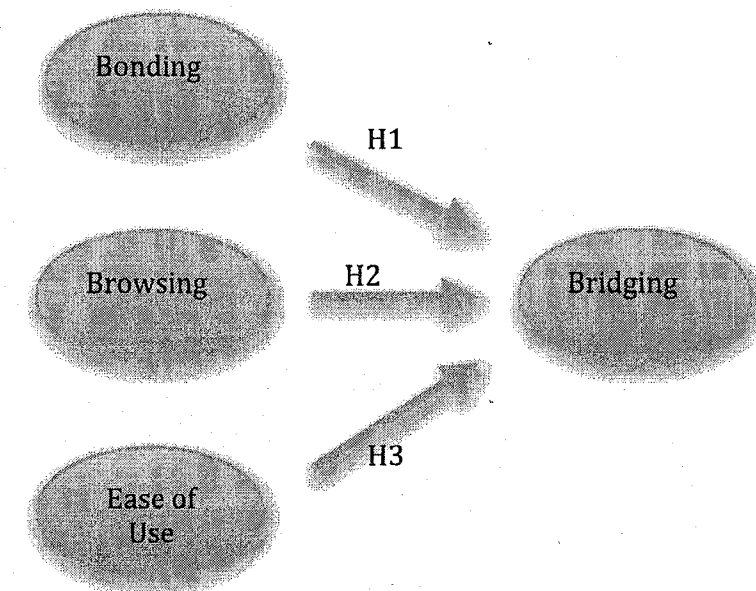
3.7.1 H1: An individual's bonding capital will impact his/her bridging capital

The concepts of bonding and bridging ties stem from the work of Grennovetter. They were renamed and popularized by Putnam, in attempt to qualify that social capital is not *all* positive; and that some types of social capital are *better* than others(Leonard, 2004). Bridging social capital exists between loosely tied individuals, while bonding capital indicates stronger relationship ties. Researchers in the area focus on testing this

typology, in order to gauge how the two types interact, whether they are in fact different, and how to measure them.

This thesis revolves around predicting the factors that impact bridging social capital. Not only does it contribute to understanding bridging social capital, but it also suggests the relationship that can exist between bonding and bridging social capital. While it is generally accepted that these two types of social capital are in fact different and have various uses/benefits, I posit that bonding social capital here is an antecedent to bridging social capital.

Several studies are in support of this hypothesis and have confirmed this relationship. In a study of 8 Phoenix neighbourhoods, Larsen et al. investigate whether higher social capital lead to civic action. They confirm that there are two forms of social capital, bonding and bridging. Further their findings support the notion that bonding is an antecedent to bridging. As such bridging social capital, they suggest, requires the existence of bonding social capital (as well as other resources such as money and education). (Larsen et al., 2004)

This concept also translates well into the technology space within which the thesis is situated. A longitudinal study of an ERP implementation, found that building bonding social capital is an important antecedent to bridging social capital. Where bonding social capital is low, little obligation is to the team. Combined with instability (which many IT projects experience), individuals begin using their social capital for themselves, as opposed to for the good of the project. (Newell, Tansley, & Huang, 2004)

The relationship being articulated by this hypothesis is similar; in that higher bonding capital would contribute to higher levels of bridging social capital. The reasoning for this relationship is twofold. First, according to Putnam, bonding social capital gives individuals a network for social support. Having the backing of that network, individuals are more likely to reach out to further ties. Second, is the effect of network externalities. Networks like LinkedIn are used to expose latent ties. It follows then that the more initial ties an individual has, the more latent ties are exposed, thus growing the network out to a greater number of weakly tied individuals. A potential future study could consider whether bonding ties are the first set of contacts added.

3.7.2 H2: Browsing behaviours will impact an individual's bridging capital

The searching/browsing framework posits that searching behaviour would constitute using a social network in order to maintain friendship and search out additional information about friends, while browsing behaviour would constitute seeking out online contacts to meet offline (Lampe et al., 2006). Logically this aligns well with the framework of bonding and bridging ties. Any tie created as a result of browsing behaviour would then begin as a bridging (or weak) tie. As such I hypothesize browsing behaviour will have a positive impact on bridging social capital.

3.7.3 H3: Ease of use will impact an individual's bridging capital

This third premise has been included in order to gather some information regarding the technology at hand. This was done primarily to understand the impact of the actual website on bridging social capital. Ease of use was selected as a practical measure of understanding this relationship. Perceived ease of use is the degree of ease with which a person believes they can use a system free from effort. It is a predictor of

whether a system is useful and whether or not it is used. Because LinkedIn functions much like an application, rather than a website, it is appropriate to apply ease of use for this research. As such I posit that if LinkedIn is not easy to use, then it will not positively contribute to bridging capital—thus a positive relationship should exist between the two variables. (Davis, 1989)

In addition to ease of use, the TAM model also includes a usefulness construct. Usefulness was not tested because it is a predictor of whether the system helps an individual with a particular task or job. Due to the immature stage of social networking websites it is difficult to measure whether the technology is useful, because its use is still being developed. Future studies should investigate the uses of LinkedIn in an exploratory format, then test whether the technology is in fact useful in this way. For the purpose of this study, the use is proposed to be bridging capital. It is the use identified by the site's creators (as explained in section 4.1.1). As such one way to interpret the data is to allow the bridging capital measure to also serve as a measure of usefulness.

4 Research methods and data sources

4.1 Data Collection

4.1.1 Background of LinkedIn

Even though online social networks are a relatively new technology, they have had incredible acceptance. Today, there are hundreds of social networking sites, surrounding many purposes. Wikipedia identifies 158 different social networks, and with the ability to now create your own social network site, this list is certainly not exhaustive. Part of the difficulty in online social network research is that social networking sites are different from each other, and in aggregate, may not be as predictive (Hargittai, 2007). Thus selecting which network to study is a strategic choice made by the researcher.

All of the sites have a common backbone, which is a visible network. They differ in purpose however—some sites, like online communities, are centered on interests, culture, religion, shared experiences, and etc. Others are vastly broad in scope, like Facebook or MySpace, accumulating more than 250 million users. It is this differentiation of use that made the selection of a specific site for this research important.

LinkedIn is an online professional social networking site launched in 2003. Rather than having a broad audience it is slightly more specific toward professionals—and in that sense it is an application used to identify opportunities through a social network. While it is not the first or the only social network for professionals, it is the largest, with 43 million members across 200 countries. (LinkedIn.com)

LinkedIn has been selected for this research because of its purpose and scope. While it is not as broad and inclusive as Facebook, it does attract a large variety of individuals. Generally, LinkedIn attracts professionals, however given the number of professions that exist, their market is broad. As such, it is not an interest based online community, but rather a network of professionals connected online. This is important because it is proposed here that social networks differ from online communities in that they are ego-centered not interest-based. Belonging to a community held together by an interest or shared experience would likely have a different impact on social capital.

Secondly, LinkedIn was selected because of its purpose. As identified by LinkedIn using the website you can:

- Find potential clients, service providers, subject experts, and partners who come recommended
- Be found for business opportunities
- Search for great jobs
- Discover inside connections that can help you land jobs and close deals
- Post and distribute job listings
- Find high-quality passive candidates
- Get introduced to other professionals through the people you know

This is relevant here because the uses of the site are closely aligned with bridging social capital. As previously identified, bridging social capital is weakly tied, exposing opportunities, and transferring information faster than bonding social capital. The site is engineered for the purpose of creating and maintaining these bridging relationships. Thus, it is most appropriate to evaluate it through this lens.

4.1.2 Data Sources

The data for this research was gathered using a self-administered online survey. Constructs used in the survey are attached in Appendix B. The survey design was cross-sectional, meaning that it gathered information about one point in time rather than longitudinally (Creswell, 2008). Using survey methods to gather the data is appropriate for several reasons. Firstly, due to the quantitative nature of survey data, it can be used to gather a larger sample and generalize findings across a population. Secondly, the framework studies used as constructs for the model (Williams, 2006; Lampe, 2006; Davis, 1989) use survey methods, providing the researcher with a set of validated constructs. Lastly, online web surveys provide several additional advantages such as: immediate data storage, convenience for the respondent, low cost, and efficient ability to digitize the data for usage with statistical software.

A single-stage sampling procedure was used, thus surveying individuals directly (Creswell, 2008).The survey respondents were invited to participate in the survey through LinkedIn. In this sample, data on non-users was not gathered; as such using LinkedIn directly provided the opportunity for a dense sample of qualified candidates (the qualifier being an account on LinkedIn). The drawbacks of this approach are discussed in section 6.1.

The first method of inviting survey responses consisted of an email to the contact list belonging to the researcher. However, using this set of contacts is likely to introduce a strong sample bias, as users of social network sites tend to initially segregate themselves by nationality, age, education level and etc. (Hargittai, 2007). In order to achieve a more random sample, which is more desirable in survey research (Babbie,

1990), links for the survey were also posted on various LinkedIn groups. Due to ethics considerations, the surveys were kept anonymous. As such, it is difficult to know what percentage of the surveys came from the groups, or further removed ties. It can be assumed that at least 50% of the responses are outside of the close network (since the number responses doubles the number of contacts in my network).

Information about the socio-demographic characteristics of the sample was gathered in order to verify whether the sample was representative of the LinkedIn population. With 167 responses, and a 50% response rate, the statistics show that the sample is representative. Table 7 identifies the sample relative to the statistics of the LinkedIn population.

Table 7: LinkedIn demographic statistics as compared to the research sample

LinkedIn Population	Sample Population
56% Male	60% Male
Average age of 41	Average age of 38.80
83% Caucasian	79% Caucasian
$60-100K 29%, $100K + 38%	$50-75K 40%, $100K + 27%
53% College educated (28% Graduate school)	35% College educated (39% Graduate school)

Source: http://www.quantcast.com/linkedin.com#demographics

4.2 Data Preparation

Data preparation is an essential step in quantitative research. Improper treatment of the data prior to analysis can confound the findings. The gathered data must be

transposed into a numerical format understood by the statistical program used for analysis—in this case being VisualPLS.

The self-administered online surveys were hosted on a survey tool called Zoomerang. The questionnaire for this research consisted of Likert scale questions, with ratings from 1 to 5 (with 1=Never, 2=Seldom, 3=Sometimes, 4=Often, 5=Very Often). One of the advantages of using online survey software like Zoomarang is its ability to handle data efficiently. Here the data was downloaded into an Excel file format. Zoomerang translated all of the Likert scale questions into a numerical format. The question names were then changed to four characters each for VisualPLS consideration. This data file was then loaded for statistical analysis.

Additional data such as the socio-demographic characteristics of the sample listed in Table 7 of the previous section (4.1.2), where interpreted directly on Zoomerang, and are also presented in Chapter 6.

4.3 Data Analysis

The method of statistical analysis for used in this thesis is Structural Equation Modeling (SEM) using the partial least squares (PLS) approach. SEM combines multiple regression and factor analysis, allowing the researcher to interpret several relationships of a model in one step, and determine model fit. SEM is appropriate here because the model, as well as the hypotheses surrounding it, are *a priori*. Meaning, the model has been created prior to data collection, and SEM is used to determine the value of the model.

In addition to measuring the model fit, SEM simultaneously measures the individual factors that make up the model constructs. The specific method of SEM used

here is partial least squares, which is a multivariate regression technique rooted in path-analysis. In addition to being able to test *a priori* knowledge derived from theory, PLS divides model testing into two components: the measurement and the structural model. In this case the measurement model consists of the questions used to measure the individual constructs. This allows the researcher to test whether the questions are in fact measuring the construct by way of a confirmatory factor analysis. The structural model consists of the relationships between these constructs. These relationships form the explanatory power of the whole model, as well as the relationships between the constructs (paths). (Igbaria & Greenhaus, 1992)

In addition to its ability to simultaneously measure the measurement and structural models, other reasons for using PLS are its ability to handle exploratory data, where little theoretical knowledge is developed, its ability to handle small sample sizes, and no requirement for normally distributed data.

This process may indicate that the model is inappropriate, leading to a modification of the hypothesis, or a complete reassessment of the model. Secondly, SEM is used successfully to identify latent variables. Because the study is exploratory in nature it is quite likely that latent variables connecting constructs may emerge. Thus, the analysis will be used to understand patterns between variables and well as explain these patterns as completely as possible using the model. (Kline, 2005)

Specifically, SEM can be used to represent knowledge or hypotheses about a studied phenomenon, which is usually based on an existing or proposed theory that describe and explain the phenomenon. Once the theory has been developed about the

phenomenon of interest, it can be tested against empirical data. (Raykov & Marcoulides, 2006)

This thesis uses quantitative data gathered using an online survey, then downloaded into VisualPLS for statistical analysis. The method used by this program is partial least squares.

4.4 Confirmatory Factor Analysis

SEM is an *a priori* approach to data analysis. As such my first step was to specify the measurement model, which has a theoretical basis. Thus, the scales used to measure the concepts of the proposed model were operationalized from work done by prior researchers. An alternative option would have been to develop my own scales, however this is outside of the scope of this thesis. Scale development poses the risk of not actually measuring the constructs, and as such can be a lengthy and iterative process. As such previously tested scales were used for this research, thus improving the content validity of the measures. Nonetheless, these scales have never been placed together in this fashion; therefore it is important that data analysis begins with Confirmatory Factor Analysis (CFA). Further, while the scales were not created from scratch, some items were modified to better fit the study. Thus, CFA ensures the scale appropriateness given this new context, as well as ensuring that modified items that have been added to the scales positively contribute to the construct.

Conducting the CFA enables the researcher to make certain that all the specified measures contribute to the construct significantly. Further it improves the parsimony of the model by reducing its complexity. While it is generally agreed that factors should

load 0.70 or higher to confirm that independent variables identified *a priori* are represented by a particular factor, this research is exploratory in nature. Thus, factor loadings as low as 0.40 are appropriate (Hair, Anderson, Tatham, & Black, 1998). The reason that this research is exploratory is because while the individual constructs in the model have been individually tested by other researchers, this is the first time that they are being brought together in this manner. This also impacts the directionality of the hypotheses. Because the relationships have not been tested before the direction is not known, but rather only partially informed by the research. As such only the results can prove the directionality of the hypotheses. The steps followed in this process were 1) examine all factors 2) remove factors with loading of less than 0.40. In SEM the model fit and the CFA are presented in one step. As such this allowed me to observe the model fit before and after the CFA. The results of the CFA are now discussed as part of the research findings.

5   Research findings

5.1   CFA Results

After specifying the model in VisualPLS the first step was to conduct a factor analysis. This initial CFA in Table 8 shows all of the scales initially used to measure the constructs. A discussion of these measures and their individual constructs follows. A legend for the question codes can be found in Appendix B.

Table 8: Initial Confirmatory Factor Analysis

Scale Items	Ease of Use	Browsing Behaviour	Bonding capital	Bridging capital
ELRN	0.7760	0.2906	0.1056	0.2139
EOU	0.7938	0.3187	0.1956	0.2200
ECTRL	0.8103	0.2910	0.1799	0.2304
EUND	0.8121	0.2395	0.1961	0.2244
EFLX	0.5881	0.1037	0.1616	0.1917
ESKL	0.4424	-0.0116	0.0155	0.0346
EBRDG	0.5950	0.1975	0.1461	0.4367
EBND	0.4435	0.1701	0.3178	0.2365
SBPI	0.3248	0.8193	0.2397	0.5197
SBJC	0.1875	0.5222	0.0624	0.2354
SBJO	0.2584	0.8182	0.3509	0.5113
SBFF	0.1708	0.7123	0.1355	0.3676
BOID	0.1999	0.2356	0.7958	0.4536
BOPS	0.1394	0.2334	0.7364	0.4197
BOLC	-0.0664	-0.0087	0.3213	0.1831
BOEL	0.0184	-0.0494	0.2930	0.1670
BORL	0.1506	0.0982	0.6098	0.3476
BOGR	0.2419	0.1490	0.6166	0.3515

BOLD	-0.0587	-0.0988	**0.1886**	0.1075
BOAI	0.1346	0.1967	**0.6717**	0.3829
BOFI	0.1610	0.0802	**0.5384**	0.3069
BROI	0.3099	0.3803	0.4781	**0.7440**
BRTN	0.3020	0.3305	0.5114	**0.7283**
BRUT	0.2629	0.4041	0.3828	**0.6770**
BRCW	0.2745	0.3143	0.3282	**0.5699**
BRLC	0.3349	0.4105	0.4898	**0.7835**
BRBP	0.3170	0.4428	0.4866	**0.8008**
BRWC	0.2858	0.3169	0.3518	**0.5929**
BRSC	0.3346	0.4905	0.3852	**0.7664**
BRNP	0.2772	0.4891	0.4485	**0.7964**
BRNP2	0.3063	0.5093	0.3431	**0.7411**

5.1.1 Ease of Use

All of the scale items for the construct of Ease of Use passed the 0.40 factor-loading threshold. However, while the rest of the research is exploratory in nature, the EOU construct has been developed and tested for over 25 years now. As such this scale should be subjected to the stricter cut-off od0.70 for the factor loading. Of the initial 6 measures developed by Davis (1989), ESKL (The website behaves in unexpected ways) was thus dropped from the model. Two new measures (EBRDG: It is easy to meet people I've never met before using the website and EBND: It is easy to find and add my contacts to my network) were introduced that also fell below the 0.70 cut-off. However, their presence was maintained because they qualified to be treated according to the 0.40 threshold.

5.1.2 Browsing Behaviour

All the scale items were maintained for the browsing behaviour construct. Even though these measures were exploratory, only one of them (SBJC: Searching for potential job candidates) fell below the 0.70 cut-off considered to be standard. This shows the strength of the browsing behaviour construct.

5.1.3 Bonding Capital

Of all four constructs, bonding social capital had the weakest CFA. Three factors (BOLC: When I feel lonely, there are several people on LinkedIn I can contact, BOAL: If I needed an emergency loan of $500, I know someone on LinkedIn I can turn to and BOLD: The people I interact with on LinkedIn would share their last dollar with me) were dropped from the construct measure. Overall, it may be that there is a difficulty measuring bonding capital, as it exists on LinkedIn because the site is geared toward more weakly tied relationships. Opportunities to improve this scale should be a part of future research, discussed further in section 6.1.

5.1.4 Browsing Capital

The browsing capital scale performed well in the context of this research, with all of the factors being significant at the 0.40 level, and only 3 falling below the 0.70 level. As such all of the question items were maintained for this construct.

Table 9 shows the CFA after I dropped the low-performing constructs and ran the data analysis again. As a result the model became more accurate as shown with better factor loadings overall and with fewer individual measures, thus also improving the parsimony of the model.

Table 9: Final confirmatory factor analysis

Scale Items	Ease of Use	Browsing Behaviour	Bonding capital	Bridging capital	T-Statistic
ELRN	**0.7616**	0.2903	0.0844	0.2085	10.6487
EOU	**0.7999**	0.3184	0.1763	0.2206	14.6867
ECTRL	**0.7809**	0.2904	0.1596	0.2267	11.5194
EUND	**0.8057**	0.2391	0.1905	0.2244	12.5557
EBRDG	**0.6368**	0.1973	0.1373	0.4343	7.7115
EBND	**0.4645**	0.1705	0.3157	0.2358	3.6346
SBPI	0.3342	**0.8172**	0.2081	0.5147	23.6485
SBJC	0.1950	**0.5207**	0.0548	0.2333	5.7479
SBJO	0.2748	**0.8205**	0.3245	0.5180	21.3898
SBFF	0.1869	**0.7130**	0.1264	0.3696	11.3600
BOID	0.2057	0.2361	**0.8249**	0.4592	8.2740
BOPS	0.1347	0.2339	**0.7609**	0.4236	6.5064
BORL	0.1441	0.0985	**0.6325**	0.3521	4.6075
BOGR	0.2237	0.1493	**0.6358**	0.3540	4.3531
BOAI	0.1372	0.1973	**0.6829**	0.3802	5.2740
BOFI	0.1619	0.0806	**0.5393**	0.3003	3.2410
BROI	0.3137	0.3806	0.4783	**0.7501**	10.2505
BRTN	0.3071	0.3309	0.4986	**0.7241**	7.1777
BRUT	0.2737	0.4046	0.3779	**0.6823**	8.6694
BRCW	0.2980	0.3151	0.3366	**0.5879**	7.1255
BRLC	0.3298	0.4101	0.4671	**0.7698**	11.2256
BRBP	0.3173	0.4427	0.5024	**0.8183**	12.1308
BRWC	0.2835	0.3167	0.3494	**0.5945**	7.7499
BRSC	0.3448	0.4909	0.3724	**0.7672**	11.7354
BRNP	0.2867	0.4891	0.4376	**0.7975**	8.2396
BRNP2	0.3206	0.5092	0.3007	**0.7209**	8.3479

p-value for all factors <0.0001 except EBDN (0.0002) and BOFI (0.0007)

5.2 Construct Validity and Reliability

Construct validity can be defined as the extent to which the scales used measure the appropriate concept (Bagozzi, Yi, & Phillips, 1991). I have already examined the appropriate levels for the factor loadings in the first part of the factor analysis. The next step is to examine convergent validity, discriminante validity, and reliability.

Convergent validity is established when the loadings are significant and above 0.70 (Chin, 1998). Discriminant validity is established when each of the items loads highest on the correct construct (Gefen & Straub, 2005). Secondly, the square root of the AVE value should be greater than any number in the same row or column and above 0.50. Lastly, reliability indicates whether the answers are repeatable therefore giving consistent results. Most commonly reliability is measured by the Cronbach Alpha, with values of above 0.70 being acceptable (Fornell & Larcker, 1981).

As can be seen in Table 10 all of the measures but two (the AVE for Bonding Capital and the Cronbach Alpha for Bridging Behaviour) show appropriate results. Further, I tested statistical significance by using the t-statistic generated for each variable during the bootstrap analysis. All of the measures are significant at the 0.01 level and a full list of t-values for each question can be found in Table 9 (previous page). The Cronbach Alpha for the Bridging Behaviour construct on the other hand reaches the threshold when rounded, and as such I will treat it as reliable. Bonding social capital seems to be a difficult construct to capture. In the initial research proposed for this scale, Bonding was also a slightly weaker measure (Williams, 2006). As such this result is not surprising and will be discussed as a model limitation. Further, two constructs in this model, Bonding and Bridging Social Capital, are formative constructs. Traditional

construct validity techniques (convergent and discriminant validities) cannot be applied to formative constructs (Petter, Straub, & Rai, 2007).

Table 10: Composite Reliability, AVE and Cronbach Alpha

Construct	Composite Reliability	AVE	Cronbach Alpha
ease	0.858631	0.510454	0.793718
behav	0.810464	0.523761	0.693755
bond	0.836316	0.464496	0.805859
bridge	0.914496	0.519471	0.907194

When testing formative constructs for validity and reliability, one is concerned with multicollinearity, which can be inspected using the Correlation Table (Table 11). Where multicollinearity is present two constructs are changing together and thus measuring the same thing—they are highly correlated. Because none of the items in the table are highly correlated it can be said that the formative constructs in the model are sound.

Table 11: Correlation table

	ease	behav	bond	bridge
ease	1.000			
behav	0.349*	1.000		
bond	0.250**	0.272**	1.000	
bridge	0.406*	0.589*	0.557*	1.000

*p-value of <0.0001 **p-value of <0.0005

5.3 Model Fit

Once the CFA was completed, and the non-contributing measures were dropped, I recalculated the model fit for the new measurement model. The model fit as indicated by the R^2 prior to the CFA was 0.536. This indicates that the model explained 53.6% of the variance in bridging social capital using the ease of use, bridging behaviour, and bonding social capital constructs. The final structural model shown in Figure 3 improved slightly with a final R^2 of 0.538. Further, parsimony of the model was improved as fewer measures were used to produce better results. All three of the constructs also showed to be statistically significant with a p-value of < 0.0001 calculated using the t-statistic, shown in brackets. The implications for this structural model will now be discussed in Chapter 6.

Figure 3: Factors affecting bridging social capital
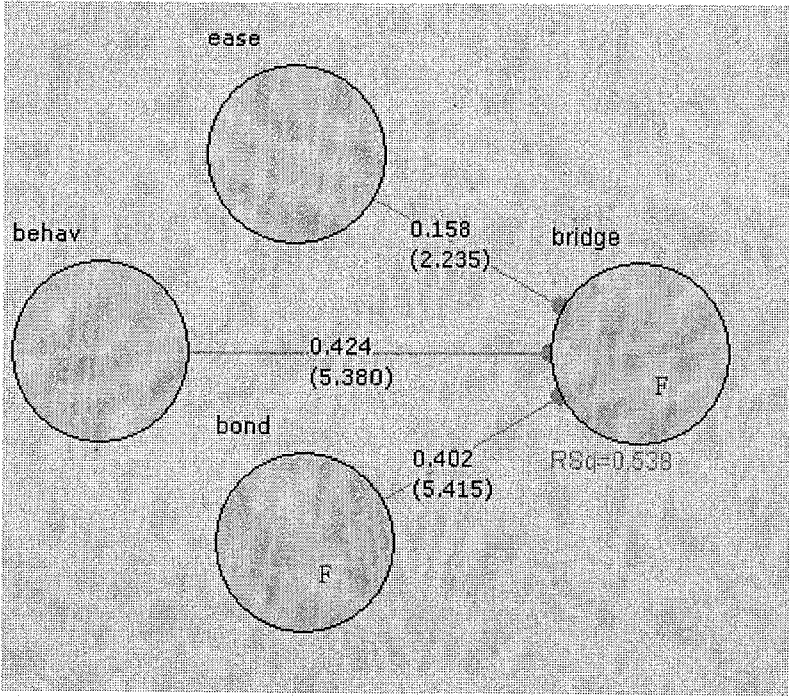
6 Discussion

The purpose of this research is to develop a predictive model which will allow us to understand how online browsing behaviours, bonding social capital, and ease of use impact bridging social capital online. At the outset of the research, I hypothesized that all three variables would have a positive impact on explaining the variance in bridging social capital. The data does show support for all three initial hypotheses.

Prior to examining the individual hypotheses, some additional conclusions can be drawn from individual questions outside of the suggested model. In addition to looking at different types of website uses, some descriptive statistics gathered will be discussed. Mainly, I will investigate the impact of gender, level of education, and age on the model variables.

Firstly, Figure 4 shows that half of the sample uses the website at least once per day. This would indicate that the network has become a part of their daily routine. Researchers have suggested that social networks are different than past online groups because they mirror people's offline networks. While this concept is not fully explored here, and discussed further in section 6.1, this frequent participation leads me to believe that in the very least the network is important to the participants.

Figure 4: Frequency of LinkedIn use
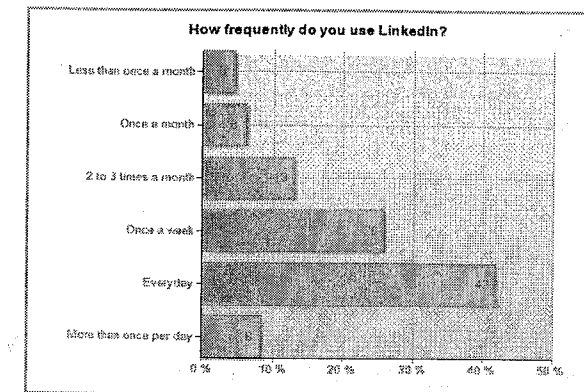
Secondly, very few users indicated that they were actually meeting new individuals through LinkedIn. Figure 5 shows that 73% of the sample met less than 10% of their network on the site directly. Further to this, of the 73% there may be respondents who met no new individuals on LinkedIn at all because the question did not provide a zero per cent option. This implies that LinkedIn facilitates in broadening bridging relationships that exist in an individual's offline network. Thus there is a possible area of growth for this type of social network. LinkedIn can branch out into facilitating completely new relationships.

Figure 5: Percentage of new contacts acquired through LinkedIn
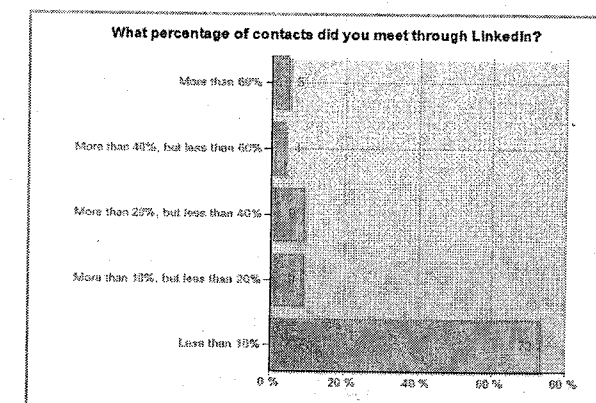
Interestingly, when the sample was filtered for those respondents who have met more than 10% of their network through LinkedIn alone, a secondary implication was found. Thirty-two percent of the surveyed sample had between 20-50 contacts (Figure 6).

Figure 6: Number of contacts on LinkedIn
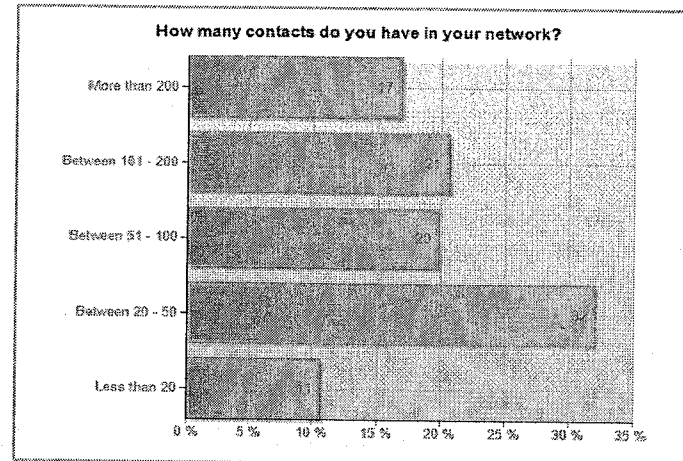
On the other hand, those individuals who used LinkedIn to meet new contacts had a much larger network, with 34% of them with networks greater than 200 contacts (Figure 7).

Figure 7: Number of contacts held by individuals who have met more than 10% of their network on LinkedIn
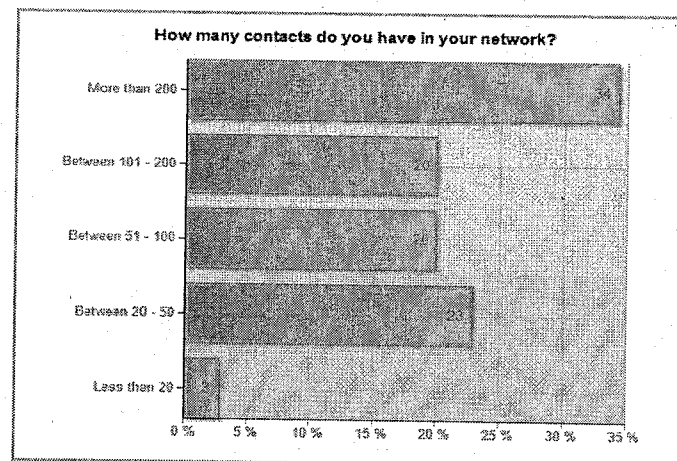
The question then becomes, do individuals with a greater number of contacts, behave differently than those with a lesser number? The sample of these potential "super-users" is not high enough to be generalizable here. However, ANOVA results (shown in Table 12) do present a statistically significant difference between the individual responses for browsing behaviours displayed by users with different numbers of contacts. The groups are divided into people with: 1) < 20 contacts 2) 20-50 contacts 3) 51 to 100 contacts 4) 101 to 200 contacts and 5) > 200 contacts. The differences between them are significant at the 0.05 level. The mean responses for the 200+ contacts category are higher than that of the other categories, with the exception of SBJO "Searching for potential job/business opportunities", where it is second highest (see Appendix D for descriptive tables). This leads me to believe that this group is showing a higher level of browsing behaviours. While user typologies are not the focus of this thesis, further research could be conducted in this area.

Table 12: ANOVA Results for Browsing Behaviour and Number of Contacts

		Sum of Squares	df	Mean Square	F	Sig.
SBPI	Between Groups	38.497	4	9.624	7.903	.000
	Within Groups	197.275	162	1.218		
	Total	235.772	166			
SBJC	Between Groups	50.605	4	12.651	9.938	.000
	Within Groups	206.221	162	1.273		
	Total	256.826	166			
SBJO	Between Groups	20.938	4	5.235	2.964	.021
	Within Groups	286.056	162	1.766		
	Total	306.994	166			
SBFF	Between Groups	12.256	4	3.064	3.001	.020
	Within Groups	165.397	162	1.021		
	Total	177.653	166			

In addition to looking at difference of use, I investigated whether several socio-demographic variables displayed a difference of means. In particular, I checked the means for different age groups, educational levels attained, incomes and genders. Previous research discussed in section 2.1.5 pointing out there differences between age groups, gender and even religion can impact the way we use social networks. Perhaps in contrast to this is Hargittai (2007) shows that initially users of social networks band together. Not many differences existed between the various demographic groups. Perhaps given that LinkedIn is a relatively new technology, this is what we are observing here. The statistical result for these variables can be found in Appendix D.

The socio-demographic variable that seemed to have the most impact was Education. Here there was a significant difference of means above the 0.05 alpha level for "Getting information about people in my industry" (SBPI), "Searching for potential job/business opportunities" (SBJO), "My interaction with the website is easy for me to understand" (EUND), and "The people I interact with on LinkedIn would help me fight an injustice" (BOFI). Interestingly, SBJO was the only other statistically significant question, with a difference of means in education, gender, and age. The ability to search for job/business opportunities is one of the primary intended uses of LinkedIn. The descriptive statistics in Table 13 show us that; females, between the ages of 26 to 30, with an undergraduate degree of some graduate education use LinkedIn for this purpose. As such, LinkedIn may be a way that young professional women are reaching out in their careers and overcoming past biases. A possible area of exploration would be to measure whether females are able to actually capitalize on their social capital more often, or whether these results are pointing to effort rather than reward.

Table 13: Descriptive statistics for SBJO

SBJO: "Searching for potential job/business opportunities"		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Age	25 and under	27	2.93	1.238	.238	2.44	3.42	1	5
	26 to 30	16	3.88	1.147	.287	3.26	4.49	2	5
	31 to 40	51	2.55	1.346	.189	2.17	2.93	1	5
	41 to 50	46	3.09	1.458	.215	2.65	3.52	1	5
	51 or higher	27	3.22	1.188	.229	2.75	3.69	1	5
	Total	167	2.99	1.360	.105	2.79	3.20	1	5
Gender	Male	101	2.80	1.312	.131	2.54	3.06	1	5
	Female	66	3.29	1.390	.171	2.95	3.63	1	5
	Total	167	2.99	1.360	.105	2.79	3.20	1	5
Education	High school	9	2.67	1.581	.527	1.45	3.88	1	5
	Some college	3	4.00	1.000	.577	1.52	6.48	3	5
	College	10	3.10	1.663	.526	1.91	4.29	1	5
	Some undergraduate	13	3.08	1.256	.348	2.32	3.84	1	5
	Undergraduate	53	3.45	1.338	.184	3.08	3.82	1	5
	Some graduate	18	3.50	1.150	.271	2.93	4.07	2	5
	Masters	43	2.42	1.139	.174	2.07	2.77	1	5
	Some doctoral	5	2.40	1.342	.600	.73	4.07	1	4
	Doctorate	13	2.38	1.387	.385	1.55	3.22	1	5
	Total	167	2.99	1.360	.105	2.79	3.20	1	5

These questions give insight into possible avenues of future research. The focus for this thesis in particular however is the impact of three constructs: bonding capital, browsing behaviour, and ease of use. In addition to examining support for each hypothesis represented by the three variables, a practical discussion of the results follows.

H1: An individual's bonding capital will impact his/her bridging capital

The path coefficient for the bonding to bridging indicates that were bonding increases, an increase of 40.2% from the standard deviation can be expected in bridging social capital. This shows a strong positive relationship between browsing and bonding. This would indicate that bonding could be seen as a predecessor of bridging, as already identified is some social capital literature (Larsen et al., 2004; Newell et al., 2004). Most social capital literature agrees that these two types of capital are different (Putnam, 2000). However, describing the relationship between them the way in which it has been done in this thesis appears less common.

Identifying bonding social capital as a predecessor of bridging has important implications both in theory and practice. At the outset of this research I had hoped that LinkedIn would be a good resource for building bridging social capital. However, the data shows that having bonding capital is important to building bridging capital. This social network in particular is not designed with the purpose of strengthening close relationships, but rather building new bridges and opportunities for individuals. Practically however, the results show that giving people the ability to host their bonded network online would improve their bridging capital—and thus better fulfill LinkedIn's purpose.

The design implications for this hypothesis are such that solely professional networks could be less successful. People need the ability to bring in their close relationships as a "stepping stone" to building new ones. While social networks often don't differentiate this distance of relationships (Gross & Acquisti, 2005), users need to be able to connect with their existing bonded network first. Tools developed by LinkedIn

that support this concept include the ability to load contacts from existing email lists as well as software tools which suggest possible contacts. LinkedIn has already implemented these features. Thus, as you log on to the network, LinkedIn facilitates how quickly you can build a list of contacts. Not all social networking sites are intuitive in this way.

H2: Browsing behaviour will impact an individual's bridging capital

The path coefficient for the browsing to bridging indicates, that were browsing behavior increases, an increase of 42.4% from the standard deviation can be expected in bridging social capital. Thus again, a positive relationship between the two variables is confirmed. Browsing behaviour as defined by Lampe (2006) occurs when individuals seek out new relationships online. This hypothesis makes sense intuitively; suggesting that in order to gain loosely tied bridging relationships online you have to seek them out. Strong support for this positive relationship also suggests that individuals participating in the network are also exhibiting the correct behaviours in order to gain bridging social capital.

From a practical perspective it is important to understand these behaviours so that the design may facilitate their occurrence. As an example, one browsing behaviour is "Getting information about people in my industry". LinkedIn enables you to do this in several ways. You can browse the network by industry or by company, quickly uncovering individuals in those areas. As part of their vision, LinkedIn explains that they are in the business of identifying opportunities by uncovering previously hidden personal networks. One possible hurdle to this goal, are the privacy settings of each individual's profile. It is important the LinkedIn maintains the open spirit of the network so that

valuable information may be searchable. If individuals become weary about disclosing their place of work or industry for example, there will be little result to social browsing.

H3: Ease of use will impact an individual's bridging capital

The path coefficient for the ease of use to bridging indicates that were ease of use increases, an increase of 15.8% from the standard deviation can be expected in bridging social capital. While this percentage is statistically significant, it's contribution is smaller than initially expected. My reason for including this variable stems from preliminary conversations I had with individual users of LinkedIn early on in the research process. It seemed that some users found the site difficult to understand, and thus were put off by using it. As such I thought an important factor in being able to build bridging social capital would be the ability to use the site with ease.

Looking at the data further, there is a possible explanation for the lesser impact of this variable. Figure 9 shows that a combined 70% of the sample has been using the network for 1 year or more. As such, a majority of the sample has learned how to use LinkedIn. Where ease of use is high, there is little positive or negative impact on building bridging capital. However, I hypothesize that in a sample where ease of use would be poor, there would be a more significant impact on bridging social capital. The limitation of this study, which prevents me from exploring this further is not including non-users, as well as past users of the website. This is discussed further in Section 6.1.

Figure 9: The amount of time users have participated on LinkedIn
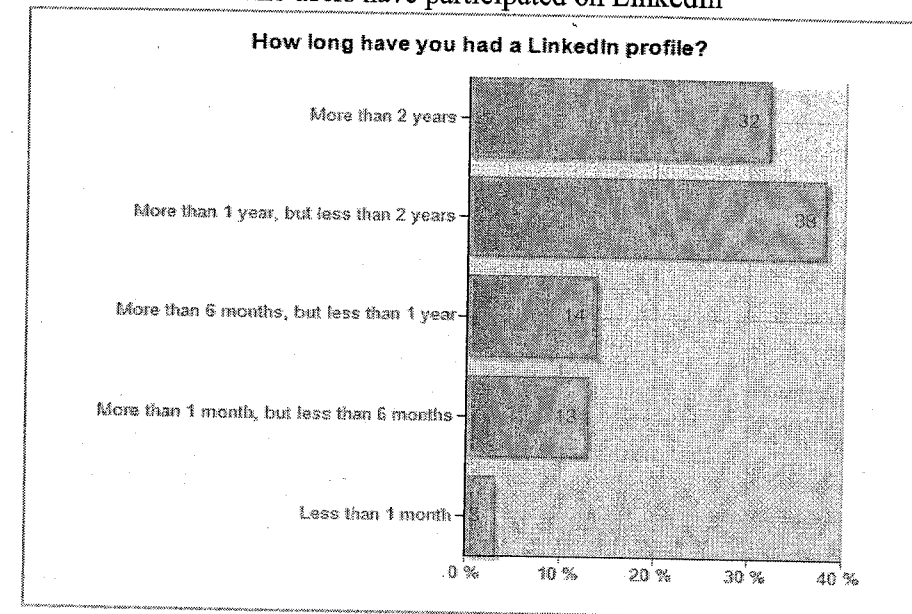
In conclusion, the data supports all three hypotheses. Bonding capital, ease of use, and browsing behaviours all contribute to predicting bridging social capital. Further, 53.8% of the variance in bridging social capital is explained by the three suggested variables. Given its exploratory nature, the model fit is an encouraging step toward future research. A discussion of the current limitations, leading to further research opportunities follows.

6.1 Limitations and future research

This thesis has served as an incredible learning tool, teaching me the process of academic research. As I reflect on the process as well as the results it is important that the limitations for this research are discussed. Many of these limitations are the result of the scope of a Masters-level thesis. As such, I intend to pursue them in future research.

The first limitation for this study is that only current users of LinkedIn participated in the survey. No non-users were included. Understanding why individuals

choose not to use the technology could be a good insight into its pitfalls. In addition, past users, who have abandoned the technology, were also not included. Excluding the users who have abandoned the site may be the reason for lowered support for the ease of use construct because individuals who found the site difficult to use simply left. This is not measured here. The choice to use only current participants was made to ease the data collection process. Further research in this area will include an exploration of why individuals leave the technology behind as well as why they choose not to join in the first place.

Another opportunity for further research is to identify additional construct that contribute to understanding the variance in bridging social capital. The study identifies three variables that explain 53.8% of that variance. Further variables will increase the model fit. Also, antecedents of those variables can be addressed to better understand the model.

The variables selected for this research were informed primarily by social capital literature. As such, looking to other areas of research, technology acceptance in particular, will lead to additional insights. As an example, network externalities may be a contributor to bridging social capital. Do people find more value using the tool if they have more friends also participating?

While this research was primarily concerned with the existence of bridging capital on LinkedIn, further research may look to separate the offline network component of capital. Thus we could understand how much social capital is created online solely. Williams (2006) suggested running the same set of bonding and bridging scales for the

individual's offline network to compare whether there is a difference between the individual's online and offline capital. Here the focus was just whether social capital was accessed online, no matter the origin.

Another consideration for this research is whether it is generalizable to other online social network technology. While the results are reliable and valid for LinkedIn, further research should include several types of online networks. Including different networks may also lead to an understanding of whether there are different uses for different networks as suggested by Hargittai (2007).

Lastly, there is an opportunity to reassess the scales utilized in this research. While developing social capital scales was outside of the scope of this thesis, further looking at developing scales would be highly beneficial. Williams (2006) presented his bonding and bridging scales in an attempt to fill this current literature gap.

Williams' approach to building the scales was rooted in the work of Putnam. He used the criteria that Putnam identified for bridging social capital 1) outward looking; 2) contact with a broader range of people; 3) a view of oneself as part of a broader group; and 4) diffuse reciprocity with a broader community as well as the criteria for bonding social capital 1) emotional support; 2) access to scarce or limited resources; 3) ability to mobilize solidarity; and 4) out-group antagonism. Some of these criteria groups were not strong measures, and ended up being dropped in the factor analysis process. Bonding social capital as a whole was a weaker construct than bridging capital. As such, there is an opportunity to reassess the bonding social capital scale. Future research can look at

developing a scale that measures the bonding capital construct more effectively, as well as considering it as a possible bridging capital predecessor.

7 Design Implications

This thesis has explored factors contributing to bridging social capital in online social networks. I have identified that three positive directional relationships exist between building bridging social capital and bonding capital, ease of use, and browsing behaviour. These results bare some design implications. Firstly, in order to facilitate the positive relationship between bonding and bridging, a network must enable users to easily find their close relationships online. Other studies have also supported the premise that bonding is an antecedent to bridging capital (Larsen et al., 2004; Newell et al., 2004) Seemingly this acts as a stepping-stone giving users the ability to build further browsing relationships.

Secondly, in order to enable the creation of bridging social capital the design of privacy settings in online networks needs to be carefully considered. Strict privacy settings can impact a person's ability to browse a social network. Browsing is the act of looking to create new relationships online. (Lampe et al, 2006) Due to increasing privacy concerns, many networks such as Facebook, have enabled and individual to "hide" their profile, allowing individuals to use the network to find others, however not be found in return. When the profiles of two individuals trying to find each other are both hidden, the network cannot link them.

The inability to find friends on a network like Facebook, meant primarily for searching or finding old friends (Lampe et al, 2006) poses less risk than it does on a network like LinkedIn. On Facebook, the individuals typically have some other means of

contact outside of the network whereby they can facilitate adding each other's profiles. For example by removing the privacy settings for a day to link to one another. This same process is not possible in instances where people do not know each other in advance. In fact, browsing a network in which every user is hidden is not possible at all.

Part of the issue is that when a user restricts their profile, they are typically not decreasing their own ability to build bridging ties, but rather someone else's, as a result of removing themselves from a potential search. Some studies have identified that privacy loss is typically at the hands of the unknowing user (Barnes, 2006). While many young individuals do not restrict the information in their profiles today, this may begin to change as they enter the professional world. (Rosenblum, 2007) Given that there is little benefit to staying open in a social network, one approach is that the networks can create this benefit. An example of one such an incentive is giving users points for participation. Even if the points are "virtual", and bare no monetary value, they may have enough positive impact on a user's reputation to urge them to participate.

In addition to creating this benefit the design of the network can be improved to make privacy less of a risk for users. Meaning, if users are not worried about the type of information they are sharing online, and they feel safe to participate, overall the network will remain open. I believe that this perceived risk is a result of the difficulties around impression management in an online social network. Individuals have less control over their identity online because they are judged not only by who they are, but also by who their network contacts are (Gross & Acquisti, 2005).. Giving individuals the ability to have firmer control over how other users impact their online identity may present a solution.

An example of user identity control on LinkedIn is the ability to approve or disapprove recommendations from other individuals. Thus, no one can attach a recommendation to another person's profile unless the owner of the profile has approved them. While this may avert risk for the user, it does also carry drawbacks. Donath et al (2004) shows that the reason that people trust networks is because they are uncensored, enabling other users to punish deceivers. Thus in giving people the ability to control their identity, the network is also reducing the level of trust others have in the network information. Dwyer et al (2007) have shown that lower levels of trust do not always result in more privacy concerns. However, while trusting the site may not be an issue, trust in necessary to build strong bonded relationships, (Gross & Acquisti, 2005) thus also having an impact on the type of tie created. It can be seen that managing privacy and online identity without devaluating the network is a challenge.

There are some design features that have already helped to synergize the relationship between the concern for privacy and impression management. Namely, users are able to restrict pieces of their profiles. Another potential improvement would be to limit the information of the user's network contacts. Meaning, if you are looking through my contact list, I have the ability to choose what you are allowed to see. If one of my contacts chooses to post a comment or photo that I wish not to reflect badly on me, I can simply turn that information off to those visiting my profile. Thus, my network is still visible—but I control to what degree. Currently, some sites allow you to turn off the ability to see a user's network of contacts. However, improving the utility of this feature would enable a network to remain more open, thus better enabling browsing, which is shown here to contribute to bridging social capital.

This thesis outlines some of the factors that are necessary to building bridging social capital on LinkedIn. This type of capital is valuable as it exposes individuals to opportunities they may not have had otherwise. Thus, users make investments of time and effort to build their network, so that they can access this capital when and if necessary. In being able to identify the contribution of these variables, several design implications have risen. Primarily, in order to build bridging capital, a network must be open, thus facilitating existing strong ties that act as a stepping-stone to browsing for new ties thus leading to bridging social capital. Careful consideration must be made for the effects of privacy settings as well as tools that enable impression management online. Where users are able to look for new opportunities and become opportunities for other network users, social networks will stand to thrive as a tool for building bridging social capital.

8 References

Adamic, L. A., Buyukkokten, O., & Adar, E. (2003). A social network caught in the web.*First Monday, 8*(6-2)

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept.*Academy Of Management Review, 27*(1), 17-40.

Aldridge, S., Halpern, D., & Fitzpatrick, S. (2002). *Social capital: A discussion paper*Performance and Innovation Unit.

Arjan, R., Pfeil, U., & Zaphiris, P. (2008). Age differences in online social networking.

Babbie, E. (1990). Survey research methods .belmont, CA: Wadsworth.

Backstrom, L., Huttenlocher, D., Kleinberg, J., & Lan, X. (2006). Group formation in large social networks: Membership, growth, and evolution. *Proceedings of the 12th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining,* 44-54.

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research.*Administrative Science Quarterly, 36*(3)

Barnes, S. B. (2006). A privacy paradox: Social networking in the united states.*First Monday, 11*(9)

Baym, N. K. (1993). Interpreting soap operas and creating community: Inside a computer-mediated fan culture.*Journal of Folklore Research, 30*(2/3), 143-176.

Baym, N. K., Zhang, Y. B., & Lin, M.C. (2002). The Internet in college social life.*Paper presented at Internet Research 3.0*, Maastrich, The Netherlands.

Blanchard, A., & Horan, T. (1998). Virtual communities and social capital.*Social Science Computer Review, 16*(3), 293.

Borgida, E., Sullivan, J. L., Oxendine, A., Jackson, M. S., Riedel, E., & Gangl, A. (2002). Civic culture meets the digital divide: The role of community electronic networks.*Journal of Social Issues, 58*(1), 125-141.

Bourdieu, P. (2001). The forms of capital.*The Sociology of Economic Life, ,*96–111.

Boyd, & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship.*Journal of Computer-Mediated Communication, 13*(1), 210-230.

Burrell, G., & Morgan, G. (1979). Sociological paradigms and organization analysis.

Burt, R. S. (1992). Structural holes.*Cambridge, MA,*

Burt, R. S. (2001). Structural holes versus network closure as social capital.*Social Capital: Theory and Research, ,*31-56.

Byrne, D. N. (2007). The future of (the)"Race": Identity, discourse, and the rise of computer-mediated public spheres.*MacArthur Foundation Book Series on Digital Learning: Race and Ethnicity Volume, ,*15–38.

Chin, W. W. (1998). Issues and opinion on structural equation modeling.*Management Information Systems Quarterly, 22*(1), 7-16.

Claridge, T. (2004). *Social capital and natural resource management: An important role for social capital.* Unpublished manuscript.

Coleman, J. S. (1988). Social capital in the creation of human capital.*American Journal of Sociology, 94*(S1), 95.

Creswell, J. W. (2008). *Research design: Qualitative, quantitative, and mixed methods approaches*Sage Pubns.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology.*MIS Quarterly, 13*(3), 319-340.

Donath, J., & Boyd, D. (2004). Public displays of connection.*BT Technology Journal, 22*(4), 71-82.

Dwyer, C., Hiltz, S., & Passerini, K. (2007). Trust and privacy concern within social networking sites: A comparison of facebook and MySpace. *Americas Conference on Information Systems (AMCIS), Keystone, Colorado, USA, Aug,*

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of facebook "friends:" social capital and college students' use of online social network sites.*Journal of Computer-Mediated Communication, 12*(4), 1143-1143.

Ferlander, S., & Timms, D. (2001).Local nets and social capital.*Telematics and Informatics, 18*(1), 51-65.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error.*Journal of Marketing Research, ,*39-50.

Fukuyama, F., Reforms, G., & Democracy, L. (2002).Social capital and civil society.

Garfinkel, S., & Spafford, G. (2002).*Web security, privacy, and commerce*O'Reilly Media, Inc.

Garton, L., Haythornthwaite, C., & Wellman, B. (1997). Studying online social networks.*3,* 0-0.

Gefen, D., & Straub, D. (2005).A practical guide to factorial validity using PLS-graph: Tutorial and annotated example.*Communications of the Association for Information Systems, 91*(109), 109.

George, A. (2006). Things you wouldn't tell your mother.*New Scientist, 191*(2569), 50-51.

Goffman, E. (1978).*The presentation of self in everyday life*Harmondsworth.

Golder, S., Wilkinson, D. M., & Huberman, B. A. (2006). Rhythms of social interaction: Messaging within a massive online network.*Arxiv Preprint Cs.CY/0611137,*

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance.*MIS Quarterly, 19*(2), 213.

Granovetter, M. S. (1973).The strength of weak ties.*The American Journal of Sociology, 78*(6), 1360-1380.

Grootaert, C., & Van Bastelaer, T. (2002a). *The role of social capital in development: An empirical assessment*Cambridge University Press.

Grootaert, C., & Van Bastelaer, T. (2002b). *Understanding and measuring social capital: A multidisciplinary tool for practitioners*World Bank Publications.

Gross, R., & Acquisti, A. (2005). Information revelation and privacy in online social networks (the facebook case).*Proceedings of the 2005 ACM Workshop on Privacy in the Electronic Society,* 71-80.

Haferkamp, D. M. N., & Krämer, N. C. (2008). Creating a digital self: Impression management and impression formation on social network sites.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). Multivariate analysis.*Englewood: Prentice Hall International,*

Hampton, K. N., & Wellman, B. (2000). Examining community in the digital neighborhood: Early results from canada's wired suburb.*LECTURE NOTES IN COMPUTER SCIENCE,* ,194-208.

Hampton, K. (2003). Grieving for a lost network: Collective action in a wired suburb.*The Information Society, 19*(5), 417-428.

Hargittai, E. (2007). Whose space? differences among users and non-users of social network sites.*Journal of Computer-Mediated Communication, 13*(1), 276-297.

Haythornthwaite, C. (2005). Social networks and internet connectivity effects.*Information, Communication & Society, 8*(2), 125-147.

Haythornthwaite, C., & Wellman, B. (2002). The internet in everyday life: An introduction.*The Internet in Everyday Life,* ,3–44.

Hsu, W. H., Lancaster, J., Paradesi, M. S. R., & Weninger, T. (2007). Structural link analysis from user profiles and friends networks: A feature construction approach.*Proceedings of ICWSM,* ,75–80.

Igbaria, M., & Greenhaus, J. H. (1992). The career advancement prospects of managers and professionals: Are MIS employees unique?*Decision Sciences, 23*(2), 478-499.

Kavanaugh, A. (1999). The impact of computer networking on community: A social network analysis approach. *Telecommunications Policy Research Conference,* 27-29.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*The Guilford Press.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation.*Quarterly Journal of Economics, 112*(4), 1251-1288.

Kositanurit, B., Ngwenyama, O., & Osei-Bryson, K. (2006). An exploration of factors that impact individual performance in an ERP environment: An analysis using multiple analytical techniques.*EUROPEAN JOURNAL OF INFORMATION SYSTEMS, 15*(6), 556.

Krishna, A., & Uphoff, N. (2002). Mapping and measuring social capital through assessment of collective action to conserve and develop watersheds in rajasthan, india. (pp. 85–124)

Kumar, R., Novak, J., & Tomkins, A. (2006). Structure and evolution of online social networks.*Proceedings of the 12th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining,* 611-617.

Lampe, C., Ellison, N., & Steinfield, C. (2006). A face (book) in the crowd: Social searching vs. social browsing. *Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work,* 167-170.

Lampe, C., Ellison, N., Steinfield, C., (2007). A familiar Face(book): profile elements as signals in an online social network. In: Proceedings of Conference on Human

Factors in Computing Systems, ACM, New York, pp. 435–444.

Larsen, L., Harlan, S. L., Bolin, B., Hackett, E. J., Hope, D., Kirby, A., et al. (2004). Bonding and bridging: Understanding the relationship between social capital and civic action.*Journal of Planning Education and Research, 24*(1), 64.

Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model.*Psychological Bulletin, 107*(1), 34-47.

Lederer, A. L., Maupin, D. J., Sena, M. P., & Zhuang, Y. (2000). The technology acceptance model and the world wide web.*Decision Support Systems, 29*(3), 269-282.

Lenhart, A., Madden, M., & Pew Internet & American Life Project. (2007). *Teens, privacy & online social networks how teens manage their online identities and personal information in the age of MySpace*Pew Internet & American Life Project.

Leonard, M. (2004). Bonding and bridging social capital: Reflections from belfast.*Sociology, 38*(5), 927.

Lewis, K., Kaufman, J., Gonzalez, M., Wimmer, A., & Christakis, N. (2008). Tastes, ties, and time: A new social network dataset using facebook. com.*Social Networks, 30*(4), 330-342.

Lin, N. (2001). Building a network theory of social capital.*Social Capital: Theory and Research, ,*3-29.

Liu, A. Q., & Besser, T. (2003). Social capital and participation in community improvement activities by elderly residents in small towns and rural communities.*Rural Sociology, 68*(3), 343-365.

Mahlke, S. (2002). Factors influencing the experience of website usage. *CHI'02 Extended Abstracts on Human Factors in Computing Systems,* 847.

Marwick, A. (2005). I'ma lot more interesting than a friendster profile: Identify presentation, authenticity and power in social networking services.*Association of Internet Researchers.6.0: Internet Generations,*

Mathieson, K. (., KeilFax.: 404-651-3830, & e-mail: mkeil@gsu.edu, M. (1998). Beyond the interface: Ease of use and task/technology fit.*Information & Management, 34*(4), 221-230.

Meredyth, D., Hopkins, L., Ewing, S., & Thomas, J. (2002). Measuring social capital in a networked housing estate.*First Monday, 7*(10)

Morris, M. G., & Dillon, A. (1997). The influence of user perceptions on software utilization: Application and evaluation of a theoretical model of technology acceptance.*IEEE Software, 14*(4), 56-75.

Morgen, S. L., & Sorensen, A. B. (1999). Parental networks, social closure, and mathematics learning: A test of coleman's social capital explanation of school effects.*American Sociological Review, 64*(5), 661-681.

Narayan, D., & Cassidy, M. F. (2001). A dimensional approach to measuring social capital: Development and validation of a social capital inventory.*Current Sociology, 49*(2), 59-102.

Narayan, D., & Pritchett, L. (1999). Cents and sociability: Household income and social capital in rural tanzania.*Economic Development and Cultural Change, 47*(4), 871-897.

Narayan, D., & Shah, T. (2000). Gender inequity, poverty, and social capital.*Policy Research Report on Gender Development, Working Paper Series.Washington, DC: World Bank,*

Newell, S., Tansley, C., & Huang, J. (2004). Social capital and knowledge integration in an ERP project team: The importance of bridging and bonding.*British Journal of Management, 15*(S1), 43-57.

Nie, N. H. (2001). Sociability, interpersonal relations, and the internet: Reconciling conflicting findings.*American Behavioral Scientist, 45*(3), 420.

Nie, N. H., & Erbring, L. (2000). Internet AND society: A preliminary report.

Nyland, R., & Near, C. (2007). Jesus is my friend: Religiosity as a mediating factor in internet social networking use. *AEJMC Midwinter Conference, Reno, NV,*

Onyx, J., & Bullen, P. (2001). 4 the different faces of social capital in NSW australia.*Social Capital and Participation in Everyday Life, ,45.*

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research.*Mis Quarterly, 31*(4), 623-656.

Pilgrim, C. J. (2008). Improving the usability of web 2.0 applications. *Proceedings of the Nineteenth ACM Conference on Hypertext and Hypermedia,* 239-240.

Pinkett, R., & O'Bryant, R. (2003). Building community, empowerment and self-sufficiency.*Information, Communication & Society, 6*(2), 187-210.

Portes, A., & Landolt, P. (1996). The downside of social capital.*The American Prospect, 26*(94), 18-21.

Preece, J. (1999). Empathic communities: Balancing emotional and factual communication.*Interacting with Computers, 12*(1), 63-77.

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of american community*Simon & Schuster.

Quan-Haase, A., & Wellman, B. (2004). How does the internet affect social capital.*Social Capital and Information Technology, ,*113–135.

Raykov, T., & Marcoulides, G. A. (2006).*A first course in structural equation modeling*Lawrence Erlbaum.

Robison, L. J., Schmid, A. A., & Siles, M. E. (2002). Is social capital really capital?*Review of Social Economy, 60*(1), 1-21.

Root, R. W. (1988). Design of a multi-media vehicle for social browsing. *Proceedings of the 1988 ACM Conference on Computer-Supported Cooperative Work,* 25-38.

Rosenblum, D. (2007). What anyone can know: The privacy risks of social networking sites.*IEEE SECURITY & PRIVACY, ,*40-49.

Skog, D. (2005). Social interaction in virtual communities: The significance of technology.*International Journal of Web Based Communities, 1*(4), 464-474.

Sproull, L., & Kiesler, S. (1991). *Connections: New ways of working in the networked organization*MIT Press.

Stutzman, F., & Russell, T. (2006). ClaimID: A system for personal identity management. *Proceedings of the 6th ACM/IEEE-CS Joint Conference on Digital Libraries,* 367-367.

Teo, T. S. H., Lim, V. K. G., & Lai, R. Y. C. (1999). Intrinsic and extrinsic motivation in internet usage.*Omega, 27*(1), 25-37.

Thelwall, M. (2008). Social networks, gender, and friending: An analysis of MySpace member profiles.*Journal of the American Society for Information Science and Technology, 59*(8)

Turkle, S. (1994). Constructions and reconstructions of self in virtual reality: Playing in the MUDs.*Mind, Culture, and Activity, 1*(3), 158-167.

Turkle, S. (1995).*Life on the screen.*New York: Simon & Schuster.

Uphoff, N., & Wijayaratna, C. (2000). Demonstrated benefits from social capital: The productivity of farmer organizations in gal oya, sri lanka.*World Development, 28*(11), 1875-1890.

Valenzuela, S., Park, N., & Kee, K. F. (2008). Lessons from facebook: The effect of social network sites on college students' social capital.

Van Der Heijden, H. (2001). Measuring IT core capabilities for electronic commerce.*Journal of Information Technology, 16*(1), 13-22.

Wachter, R. M., Gupta, J. N. D., & Quaddus, M. A. (2000). IT takes a village: Virtual communities in support of education.*International Journal of Information Management, 20*(6), 473-489.

Walther, J. B., Van Der Heide, B., Kim, S. Y., Westerman, D., & Tong, S. T. (2008). The role of friends' appearance and behavior on evaluations of individuals on facebook: Are we known by the company we keep?*Human Communication Research, 34*(1), 28-49.

Wasserman, S., & Faust, K. (1994).*Social network analysis: Methods and applications*Cambridge Univ Pr.

Wellman, B. (1997). Structural analysis: From method and metaphor to theory and substance.*CONTEMPORARY STUDIES IN SOCIOLOGY, 15*, 19-61.

Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the internet increase, decrease, or supplement social capital.*Social Networks, Participation, and Community Commitment.American Behavioral Scientist, 45*(3), 436-455.

Woolcock, M., & Narayan, D. (2000). Social capital: Implications for development theory, research, and policy.*The World Bank Research Observer, 15*(2), 225-249.

Appendix A: Literature review table

Author(s)	Date	Technology	Method	Constructs	Findings
Acquisti, & Gross	2006	Facebook	Survey and data mining	Privacy, attitudes toward privacy, privacy behaviours, information disclosure	Privacy concerns do not predict membership. There are misconceptions about privacy on the network. Users share a lot of private information on the network.
Adamic, Buyukkokten, & Adar	2003	Club Nexus	Network analysis of 2469 university students	Smallworld effect, clustering, the strength of weak ties, properties of individual profiles, association by similarity, similarity and distance	The network closely mirrors the "real-life" campus. People with similar interests to tend toward each other, however where two dissimilar individuals link a bridge is formed and a greater amount of ties exists.
Arjan, Pfeil, & Zaphiris	2008	Myspace	Content analysis of 100 user profiles using Linguistic Inquiry Word Count	Difference in word usage of different age groups	Younger individuals have more friends within their own age group, while older individuals have less friends with more links across different age groups.
Backstrom, Huttenlocher, Kleinberg, & Lan	2006	LiveJournal	Data mining	Structural social network features	Joining communities and community growth is dependant on the network structure—in particular the connections between friends, and friends of friends.
Barnes	2006	Social networks	Literature review	The privacy paradox; private versus public space; and, social networkingprivacy issues.	Teens and adults view privacy online differently.

Baym	1993	Rec.arts.tv.soaps newsgroup	Content analysis of user profiles and surveys	Exploratory study investigating what people do on computer mediated communities	Computer networks are a positive medium for folklore and building online community.
Blanchard & Horan	1998	Virtual Communities and social capital	Survey of 342 adults living in California	Community participation, civic engagement, social capital (as indicated by networks, norms and trust)	Social capital and civic engagement will increase when virtual communitiesdevelop around physically based communities and when these virtual communities foster additional communities of interest.
Boase, Horrigan, Wellman, & Rainie	2006	Internet	Survey	Impact of the internet on friendship, social capital, connectivity	The Internet helps build social capital and supports social networks
Borgida, Sullivan, Oxendine,Jackson, Riedel, & Gangl	2002	LakesNet, ItascaNet	Mail surveys, qualitative focus groups and archival data	The role of norms, cooperation and civic and political culture in Internet use (addressing the "digital divide")	When comparing situations where technology is supported by both the public and private sectors, as opposed the private sector alone, individuals are more supportive of the goal and less concerned with technology.
boyd	2006	Friendster and MySpace	Ethnographic data, case study	Friendship formation, culture and social processes	Friendship creates culture and allows users to socialize and locate themselves in an egocentric network.
boyd, Ellison	2007	Social Network Sites Friendster	Literature review	Social network history	Collectively, they show hownetworked practices mirror, support, and alter known everyday practices, especially with respect to how people present (and hide) aspects of themselves andconnect with others
Byrne, 2008	2008	AsianAvenue, BlackPlanet, and MiGente	Ethnographic content analysis of over 3,000 discussion threads	Race and ethnicity	User reputation is based on community knowledge Users have a healthy sense of racial identity Race is implicitly described in the postings

Donath &boyd	2004	Several social network sites	Literature review	Connection display, network creation, and online identity	There are social implications of the public display of one's social network
Dwyer, Hiltz, & Passerini	2007	Facebook and MySpace	Online survey of 117 users	Perceptions of trust and privacy concern, willingness to share information and develop new relationships	Both sites reported similar levels of privacy concern. However the existence of trust/willingness to share information, did not always result in new "friendship"
Ellison, Steinfield, & Lampe	2007	Facebook	Survey of 800 University Students	Facebook usage and social capital maintenance	Strong association between Facebook and social capital. Strongest relationship with bridging social capital.
Ferlander & Timms	2001	Local net in Sweden	Mixed methods: Surveys and interviews	Networks, support, belonging and trust (addressing "digital divide")	Communities where social capital is low exhibit a positive attitude and high expectations toward local net projects. Attitudes are consistent across different demographics showing the opportunity to overcome the digital divide.
Garton, Haythornthwaite, & Wellman	1997	Computer supported social networks	Literature review	Social network analysis as a method of research for CMC/CSSN	Computer supported social networks can use social network analysis to understand how structure affects them.
George	2006	Social networking sites	Literature review/opinion article	Online information sharing	A person's job or position in life (age) affects how much they are willing to post and whether they use some online networking sites at all
Golder, Wilkinson, & Huberman	2007	Facebook	Data mining	Network structure, temporal messaging, message frequency, seasonal variation	Facebook is geographically bound by schools. Facebook users display strong weekly and dailyroutines.
Gross & Acquisti	2005	Facebook	Content analysis of 4000 university students profiles	Privacy is a necessary factor of intimacy; therefore there are less close relationships online.	People are generally not aware of the privacy issues they are making themselves susceptible to.

Haferkamp & Krämer	2008	StudiVZ	12 in-depth interviews	Authenticity of SNS profiles	Online impressions are more thought out and controlled than real life
Hampton	2003	Netville online residential community	Combination of ethnographic and survey data	Weak ties, collective action, network density,	ICT facilitates community participation and collective action through large dense networks of weak ties. ICT is a good organization tool. There was no evidence to suggest that social capital decreased as a result of Netville
Hampton & Wellman	2000	Netville	Mixed methods: surveys, ethnographic observations, online focus groups, and forum monitoring.	Residents' community ties online and offline, globally and locally, civic involvement, Internet use, and individual attitudes.	The Internet supports a variety of social ties, strong and weak, instrumental, emotional. Relationships are sustained through a combination of online and offline interactions. The high rate of online activity led to increased local awareness, high rates of in-person activity and to rapid political mobilization at the end of the field trial
Hargittai	2007	Facebook, MySpace, Xanga, and Friendster	Survey	Users and non-users of social network sites	Demographics impact social network sites. Experience with social networks increases usage (resulting in digital inequity)
Haythornthwaite	2005	LEEP	Data mining	Strong and weak ties, information flow, latent ties	The communication media has a strong impact on weak ties Changes in weak ties are more disruptive than strong ties
Haythornthwaite & Wellman	2002	Internet	Introductory book chapter	The affect of Internet usage on everyday life. Investigation on how the Internet is used and its impact.	There are many positions on whether the Internet has positive, negative, or no impact on people's lives

Kavanaugh	1999	Blacksburg Electronic Village	Longitudinal study (3 year) surveys and interviews	Social ties, civic engagement	Computer networks expand social networks in geographic communities. The Internet can increase civic engagement and community involvement for people displayed preexisting involvement.
Kavanaugh & Patterson	2001	Blacksburg Electronic Village	Telephone survey	Quality of life, community involvement, and socialcapital Internet use, community attachment, and community involvement	Participation in the network did not increase community involvement. Results showed increased Internet usage for building social capital.
Lampe, Ellison, &Steinfield	2006	Facebook	Survey of 1440 university students	Social searching and social browsing	Facebook appears to be a social searching tool for investigating people met offline.
Lenhart, Madden, & Pew Internet & American Life Project'	2007	MySpace	Survey and focus groups	Online privacy among teens on MySpace	Summary statistics on what teens post, what privacy means to them, what parents should do to protect them. Study revealed age and gender differences.
Lewis, Kaufman, Gonzalez, Wimmer, & Christakis	2008	Facebook	Content analysis of 1640 university students	Culture Race/ethnicity Higher education Tastes Gender Socioeconomic status	Descriptive statistics of constructs are provided. Generally the data set analysis exemplifies the potential for future research

Marwick	2005	Friendster, Orkut, and MySpace	Social Network Analysis	Self-presentation is affected by site purpose and profile structure. Further, social networks are decontextualized from the real world because the exclude pieces (like non-users)	Framing identity influences self-presentation online.
Meredyth, Hopkins, Ewing, & Thomas	2002	Community network in Melbourne, Australia	Interviews and focus groups	Community exchanges, participation, trust, and social capital	No findings. Presentation of research agenda.
Nie	2001	Internet	Review of 4 academic surveys of Internet use	Impact of the internet use on the quantity and quality of interpersonal communication and sociability.	The Internet is decreasing face-to-face communication. The Internet does not cause users to be more sociable; more socially connected people use the Internet
Nie & Erbring	2002	Internet	Online survey of 4113 American individuals	Time spent online, types of online activities, social isolation	The more time people spend online, the more they lose contact with their social environment
Norris	2003	Online communities	Survey	Bonding and bridging functions of online groups	Type of group, and contact with that group is predictive of the bonding or bridging function. As such the internet both widens and deepens a user's social experience.
Pinkett & O'Bryant	2003	Creating Community Connections (C3)System	Case study	Community building and community technology Empowerment and self-sufficiency	After using the C3 system participants had: -Strengthened their social ties -Increased awareness of community resources -Civic engagement, social contact, cense of empowerment and sense of community was positively correlated with Internet use

Preece	1999	Online medical support group	Ethnographic study (content analysis)	Empathy and factual information in online communities	Empathy and factual info exchange both play an important role is online communities
Quan-Haase & Wellman	2004	Internet and social capital	Archival survey data	A theoretical investigation on the affects of the Internet on social capital.	The internet is adding to (not decreasing or transforming) social capital—particularly in geographically dispersed networks.
Resnick	2001	Internet	Essay	Social capital and resulting activites (resource exchange, emotional support, etc.) SocioTechnical Capital	It is possible to generate more social capital online than in previous offline settings. This may be a different type of capital called sociotechnical capital.
Rosenblum	2007	MySpace	Literature review/opinion article	Privacy risk, specifically to job and education, for posting information online	Future employers may judge individuals by their participation is social networks
Shah, Kwak, & Holbert	2001	Internet	Survey	Media use, civic engagement, interpersonal trust, and life contentment	Social capital production online is generational, with higher capital being built among younger (gen x) generations.
Skog	2005	LunarStorm	Semi-structured interviews of 14 users	Technology features used	Technology design impacts social interaction
Sproull & Kiesler	1991				
Thelwall	2008	MySpace	Content analysis of over 20,000 extracted user profiles	General demographic data and uses of MySpace	Females tend toward friendship, while males tend toward dating. Friending behaviour online can be categorized.

Valenzuela, Park, & Kee,	2008	Facebook	Online Survey of 1,715 university students	Civic journalism, public life and civic action	Moderate, positive relationships between intensity of Facebook use and students' life satisfaction, social trust, civic participation and political engagement.
Walther, Van Der Heide, Kim, Westerman, & Tong	2008	Facebook	Questionnaire of 389 university students	Impression formation from comments made by "friends"	Having attractive friends increases a user's own attractiveness. Negative messages had positive affects on attractiveness of males, but negative of females.
Wellman	1997	n/a	Book chapter	Structural network analysis	An investigation of the use of structural network analysis
Wellman, Boase, & Chen	2002	Internet	Survey	Internet use and impact on daily life.	The Internet does not weaken community—it adds to existing forms of communication.
Wellman, Haase, Witte, & Hampton	2001	Internet	Online survey of 39,211 National Geographic Web site visitors	Network capital (social ties), participatory capital (community involvement) and community commitment	Internet usage supplements face-to-face communication. Heavy Internet users are linked to in voluntary organizations and politics. Heavy users show less online community commitment
Williams	2006	Online social networks	Survey for scale development	Bonding and bridging social capital	Development of bridging and bonding social capital scales for online networks. Confirmatory factor analysis revealed bridging and bonding are two distinct but related dimensions of social capital.

Appendix B: Survey tool/question codes

Ease of use:	
ELRN	It is easy to learn how to use the website
EOU	Overall, I find the website easy to use
ECTRL	I find it easy to get the website to do what I want it to
EUND	My interaction with the website is easy for me to understand
EFLX	The website is rigid and inflexible to interact with
ESKL	The website behaves in unexpected ways
EBRDG	It is easy to meet people I've never met before using the website
EBND	It is easy to find and add my contacts to my network
Bonding Subscale	
BOID	There is someone on LinkedIn I can turn to for advice about making very important decisions.
BOPS	There are several people on LinkedIn I trust to help solve my problems.
BOLC	When I feel lonely, there are several people on LinkedIn I can contact.
BOEL	If I needed an emergency loan of $500, I know someone on LinkedIn I can turn to.
BORL	The people I interact with on LinkedIn would put their reputation on the line for me.
BOGR	The people I interact with on LinkedIn would be good job references for me.
BOLD	The people I interact with on LinkedIn would share their last dollar with me.
BOAI	I have LinkedIn contacts whom I know well enough that they would do anything important for me.
BOFI	The people I interact with on LinkedIn would help me fight an injustice
Bridging Subscale	
BROI	Interacting with people on LinkedIn makes me interested in things

	that happen outside of my industry.	
BRTN	Interacting with people on LinkedIn makes me want to try new things.	
BRUT	Interacting with people on LinkedIn makes me interested in what people unlike me are thinking.	
BRCW	Talking with people on LinkedIn makes me curious about other places in the world.	
BRLC	Interacting with people on LinkedIn makes me feel like part of a larger community.	
BRBP	Interacting with people on LinkedIn makes me feel connected to the bigger picture.	
BRWC	Interacting with people on LinkedIn reminds me that everyone in the world is connected.	
BRSC	I am willing to spend time to support general LinkedIn community activities.	
BRNP	Interacting with people on LinkedIn gives me new people to connect with.	
BRNP2	I come in contact with new people on LinkedIn all the time.	
Social searching		
SSKT	Keep in touch with old friends and colleagues	
SSNS	Check out new people I met socially	
SSNP	Check out new people I met professionally	
SSND	Finding people to date	
Social browsing		
SBPI	Getting information about people in my industry	
SBJC	Searching for potential job candidates	
SBJO	Searching for potential job/business opportunities	
SBFF	Having a face-to-face encounter with someone I was introduced to on the website	

Appendix D: Descriptive Statistics

Descriptives for Browsing Behaviour and Number of Contacts

		N	Mean	Std. Deviation	Std. Error
SBPI	Less than 20	30	2.47	1.106	.202
	Between 20 and 50	48	3.44	1.109	.160
	Between 51 and 100	34	3.00	1.206	.207
	Between 101 and 200	29	3.59	1.211	.225
	More than 200	26	3.96	.774	.152
	Total	167	3.28	1.192	.092
SBJC	Less than 20	30	1.53	1.042	.190
	Between 20 and 50	48	1.69	1.035	.149
	Between 51 and 100	34	1.41	.821	.141
	Between 101 and 200	29	2.31	1.391	.258
	More than 200	26	3.00	1.386	.272
	Total	167	1.92	1.244	.096
SBJO	Less than 20	30	2.67	1.493	.273
	Between 20 and 50	48	2.96	1.383	.200
	Between 51 and 100	34	2.62	1.371	.235
	Between 101 and 200	29	3.62	1.147	.213
	More than 200	26	3.23	1.142	.224
	Total	167	2.99	1.360	.105
SBFF	Less than 20	30	1.70	.837	.153
	Between 20 and 50	48	1.77	1.016	.147
	Between 51 and 100	34	1.76	.819	.140
	Between 101 and 200	29	2.00	1.254	.233
	More than 200	26	2.50	1.105	.217
	Total	167	1.91	1.035	.080

ANOVA (AGE)

		Sum of Squares	df	Mean Square	F	Sig.
SBPI	Between Groups	7.820	4	1.955	1.389	.240
	Within Groups	227.952	162	1.407		
	Total	235.772	166			
SBJC	Between Groups	2.191	4	.548	.349	.845
	Within Groups	254.635	162	1.572		
	Total	256.826	166			
SBJO	Between Groups	24.446	4	6.111	3.504	.009
	Within Groups	282.548	162	1.744		
	Total	306.994	166			
SBFF	Between Groups	1.450	4	.363	.333	.855
	Within Groups	176.203	162	1.088		
	Total	177.653	166			
ELRN	Between Groups	4.668	4	1.167	1.872	.118
	Within Groups	100.985	162	.623		
	Total	105.653	166			
EOU	Between Groups	2.434	4	.609	.957	.433
	Within Groups	102.967	162	.636		
	Total	105.401	166			
ECTRL	Between Groups	1.676	4	.419	.593	.668
	Within Groups	114.480	162	.707		
	Total	116.156	166			
EUND	Between Groups	5.534	4	1.384	2.203	.071
	Within Groups	101.735	162	.628		
	Total	107.269	166			
EBRDG	Between Groups	2.671	4	.668	.837	.503
	Within Groups	129.233	162	.798		
	Total	131.904	166			
EBND	Between Groups	6.110	4	1.527	1.620	.172
	Within Groups	152.705	162	.943		
	Total	158.814	166			
BOID	Between Groups	9.529	4	2.382	2.047	.090
	Within Groups	188.531	162	1.164		
	Total	198.060	166			
BOPS	Between Groups	4.362	4	1.091	1.037	.390
	Within Groups	170.440	162	1.052		
	Total	174.802	166			

BORL	Between Groups	2.785	4	.696	.663	.618
	Within Groups	170.053	162	1.050		
	Total	172.838	166			
BOLD	Between Groups	4.241	4	1.060	1.069	.374
	Within Groups	160.705	162	.992		
	Total	164.946	166			
BOAI	Between Groups	4.688	4	1.172	1.030	.394
	Within Groups	184.414	162	1.138		
	Total	189.102	166			
BOFI	Between Groups	2.915	4	.729	.648	.629
	Within Groups	182.079	162	1.124		
	Total	184.994	166			
BROI	Between Groups	6.811	4	1.703	1.637	.167
	Within Groups	168.459	162	1.040		
	Total	175.269	166			
BRTN	Between Groups	6.087	4	1.522	1.547	.191
	Within Groups	159.315	162	.983		
	Total	165.401	166			
BRUT	Between Groups	1.558	4	.389	.381	.822
	Within Groups	165.712	162	1.023		
	Total	167.269	166			
BRCW	Between Groups	3.263	4	.816	.667	.616
	Within Groups	197.995	162	1.222		
	Total	201.257	166			
BRLC	Between Groups	5.789	4	1.447	1.278	.281
	Within Groups	183.421	162	1.132		
	Total	189.210	166			
BRBP	Between Groups	5.714	4	1.429	1.395	.238
	Within Groups	165.855	162	1.024		
	Total	171.569	166			
BRWC	Between Groups	2.371	4	.593	.548	.701
	Within Groups	175.366	162	1.083		
	Total	177.737	166			
BRSC	Between Groups	5.375	4	1.344	1.255	.290
	Within Groups	173.463	162	1.071		
	Total	178.838	166			
BRNP	Between Groups	5.168	4	1.292	1.591	.179
	Within Groups	131.550	162	.812		

		Sum of Squares	df	Mean Square	F	Sig.
	Total	136.719	166			
BRNP2	Between Groups	.389	4	.097	.081	.988
	Within Groups	193.587	162	1.195		
	Total	193.976	166			

ANOVA (Gender)

		Sum of Squares	df	Mean Square	F	Sig.
SBPI	Between Groups	1.034	1	1.034	.727	.395
	Within Groups	234.738	165	1.423		
	Total	235.772	166			
SBJC	Between Groups	1.048	1	1.048	.676	.412
	Within Groups	255.779	165	1.550		
	Total	256.826	166			
SBJO	Between Groups	9.424	1	9.424	5.226	.024
	Within Groups	297.570	165	1.803		
	Total	306.994	166			
SBFF	Between Groups	.108	1	.108	.100	.752
	Within Groups	177.545	165	1.076		
	Total	177.653	166			
ELRN	Between Groups	.236	1	.236	.370	.544
	Within Groups	105.416	165	.639		
	Total	105.653	166			
EOU	Between Groups	.916	1	.916	1.447	.231
	Within Groups	104.485	165	.633		
	Total	105.401	166			
ECTRL	Between Groups	.809	1	.809	1.157	.284
	Within Groups	115.347	165	.699		
	Total	116.156	166			
EUND	Between Groups	1.328	1	1.328	2.069	.152
	Within Groups	105.941	165	.642		
	Total	107.269	166			
EBRDG	Between Groups	.489	1	.489	.614	.434
	Within Groups	131.415	165	.796		
	Total	131.904	166			
EBND	Between Groups	2.475	1	2.475	2.612	.108
	Within Groups	156.339	165	.948		
	Total	158.814	166			
BOID	Between Groups	.112	1	.112	.093	.760

		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	197.948	165	1.200		
	Total	198.060	166			
BOPS	Between Groups	.172	1	.172	.163	.687
	Within Groups	174.630	165	1.058		
	Total	174.802	166			
BORL	Between Groups	.155	1	.155	.149	.700
	Within Groups	172.683	165	1.047		
	Total	172.838	166			
BOLD	Between Groups	.001	1	.001	.001	.977
	Within Groups	164.945	165	1.000		
	Total	164.946	166			
BOAI	Between Groups	1.728	1	1.728	1.522	.219
	Within Groups	187.374	165	1.136		
	Total	189.102	166			
BOFI	Between Groups	2.211	1	2.211	1.996	.160
	Within Groups	182.783	165	1.108		
	Total	184.994	166			
BROI	Between Groups	.002	1	.002	.002	.966
	Within Groups	175.267	165	1.062		
	Total	175.269	166			
BRTN	Between Groups	.095	1	.095	.095	.758
	Within Groups	165.306	165	1.002		
	Total	165.401	166			
BRUT	Between Groups	.270	1	.270	.267	.606
	Within Groups	167.000	165	1.012		
	Total	167.269	166			
BRCW	Between Groups	.377	1	.377	.310	.579
	Within Groups	200.880	165	1.217		
	Total	201.257	166			
BRLC	Between Groups	2.141	1	2.141	1.889	.171
	Within Groups	187.068	165	1.134		
	Total	189.210	166			
BRBP	Between Groups	.584	1	.584	.563	.454
	Within Groups	170.985	165	1.036		
	Total	171.569	166			
BRWC	Between Groups	.323	1	.323	.301	.584
	Within Groups	177.413	165	1.075		
	Total	177.737	166			

BRSC	Between Groups	1.056	1	1.056	.980	.324
	Within Groups	177.783	165	1.077		
	Total	178.838	166			
BRNP	Between Groups	.090	1	.090	.108	.742
	Within Groups	136.629	165	.828		
	Total	136.719	166			
BRNP2	Between Groups	.444	1	.444	.378	.539
	Within Groups	193.532	165	1.173		
	Total	193.976	166			

ANOVA (Education)

		Sum of Squares	df	Mean Square	F	Sig.
SBPI	Between Groups	22.407	8	2.801	2.074	.041
	Within Groups	213.365	158	1.350		
	Total	235.772	166			
SBJC	Between Groups	17.451	8	2.181	1.440	.184
	Within Groups	239.375	158	1.515		
	Total	256.826	166			
SBJO	Between Groups	40.797	8	5.100	3.027	.003
	Within Groups	266.197	158	1.685		
	Total	306.994	166			
SBFF	Between Groups	14.110	8	1.764	1.704	.101
	Within Groups	163.543	158	1.035		
	Total	177.653	166			
ELRN	Between Groups	9.638	8	1.205	1.982	.052
	Within Groups	96.015	158	.608		
	Total	105.653	166			
EOU	Between Groups	6.424	8	.803	1.282	.257
	Within Groups	98.978	158	.626		
	Total	105.401	166			
ECTRL	Between Groups	10.137	8	1.267	1.888	.065
	Within Groups	106.019	158	.671		
	Total	116.156	166			
EUND	Between Groups	10.179	8	1.272	2.071	.042
	Within Groups	97.091	158	.614		
	Total	107.269	166			
EBRDG	Between Groups	6.699	8	.837	1.057	.396
	Within Groups	125.206	158	.792		
	Total	131.904	166			

EBND	Between Groups	10.789	8	1.349	1.440	.184
	Within Groups	148.025	158	.937		
	Total	158.814	166			
BOID	Between Groups	8.236	8	1.029	.857	.554
	Within Groups	189.824	158	1.201		
	Total	198.060	166			
BOPS	Between Groups	7.274	8	.909	.858	.554
	Within Groups	167.529	158	1.060		
	Total	174.802	166			
BORL	Between Groups	6.048	8	.756	.716	.677
	Within Groups	166.790	158	1.056		
	Total	172.838	166			
BOLD	Between Groups	10.526	8	1.316	1.346	.225
	Within Groups	154.420	158	.977		
	Total	164.946	166			
BOAI	Between Groups	10.998	8	1.375	1.220	.291
	Within Groups	178.104	158	1.127		
	Total	189.102	166			
BOFI	Between Groups	17.908	8	2.239	2.117	.037
	Within Groups	167.086	158	1.058		
	Total	184.994	166			
BROI	Between Groups	5.176	8	.647	.601	.776
	Within Groups	170.094	158	1.077		
	Total	175.269	166			
BRTN	Between Groups	4.646	8	.581	.571	.801
	Within Groups	160.755	158	1.017		
	Total	165.401	166			
BRUT	Between Groups	6.325	8	.791	.776	.624
	Within Groups	160.944	158	1.019		
	Total	167.269	166			
BRCW	Between Groups	8.891	8	1.111	.913	.507
	Within Groups	192.366	158	1.218		
	Total	201.257	166			
BRLC	Between Groups	17.118	8	2.140	1.965	.054
	Within Groups	172.091	158	1.089		
	Total	189.210	166			
BRBP	Between Groups	10.782	8	1.348	1.324	.235
	Within Groups	160.787	158	1.018		

		Sum of Squares	df	Mean Square	F	Sig.
	Total	171.569	166			
BRWC	Between Groups	6.789	8	.849	.784	.617
	Within Groups	170.948	158	1.082		
	Total	177.737	166			
BRSC	Between Groups	11.763	8	1.470	1.390	.204
	Within Groups	167.075	158	1.057		
	Total	178.838	166			
BRNP	Between Groups	4.287	8	.536	.639	.744
	Within Groups	132.432	158	.838		
	Total	136.719	166			
BRNP2	Between Groups	17.404	8	2.176	1.947	.057
	Within Groups	176.572	158	1.118		
	Total	193.976	166			

ANOVA (Income in thousands)

		Sum of Squares	df	Mean Square	F	Sig.
SBPI	Between Groups	13.070	7	1.867	1.333	.238
	Within Groups	222.703	159	1.401		
	Total	235.772	166			
SBJC	Between Groups	27.112	7	3.873	2.681	.012
	Within Groups	229.714	159	1.445		
	Total	256.826	166			
SBJO	Between Groups	10.273	7	1.468	.786	.600
	Within Groups	296.721	159	1.866		
	Total	306.994	166			
SBFF	Between Groups	15.866	7	2.267	2.228	.035
	Within Groups	161.787	159	1.018		
	Total	177.653	166			
ELRN	Between Groups	5.660	7	.809	1.286	.261
	Within Groups	99.992	159	.629		
	Total	105.653	166			
EOU	Between Groups	6.095	7	.871	1.394	.211
	Within Groups	99.306	159	.625		
	Total	105.401	166			
ECTRL	Between Groups	6.037	7	.862	1.245	.281
	Within Groups	110.118	159	.693		
	Total	116.156	166			
EUND	Between Groups	6.033	7	.862	1.354	.229
	Within Groups	101.237	159	.637		

		Sum of Squares	df	Mean Square	F	Sig.
	Total	107.269	166			
EBRDG	Between Groups	7.476	7	1.068	1.365	.224
	Within Groups	124.429	159	.783		
	Total	131.904	166			
EBND	Between Groups	7.925	7	1.132	1.193	.310
	Within Groups	150.889	159	.949		
	Total	158.814	166			
BOID	Between Groups	8.384	7	1.198	1.004	.430
	Within Groups	189.676	159	1.193		
	Total	198.060	166			
BOPS	Between Groups	4.543	7	.649	.606	.750
	Within Groups	170.259	159	1.071		
	Total	174.802	166			
BORL	Between Groups	8.669	7	1.238	1.199	.306
	Within Groups	164.169	159	1.033		
	Total	172.838	166			
BOLD	Between Groups	4.154	7	.593	.587	.766
	Within Groups	160.792	159	1.011		
	Total	164.946	166			
BOAI	Between Groups	5.798	7	.828	.718	.656
	Within Groups	183.304	159	1.153		
	Total	189.102	166			
BOFI	Between Groups	12.158	7	1.737	1.598	.140
	Within Groups	172.836	159	1.087		
	Total	184.994	166			
BROI	Between Groups	7.140	7	1.020	.965	.459
	Within Groups	168.130	159	1.057		
	Total	175.269	166			
BRTN	Between Groups	9.272	7	1.325	1.349	.231
	Within Groups	156.130	159	.982		
	Total	165.401	166			
BRUT	Between Groups	3.743	7	.535	.520	.819
	Within Groups	163.526	159	1.028		
	Total	167.269	166			
BRCW	Between Groups	12.600	7	1.800	1.517	.165
	Within Groups	188.658	159	1.187		
	Total	201.257	166			
BRLC	Between Groups	4.246	7	.607	.521	.817

	Within Groups	184.964	159	1.163		
	Total	189.210	166			
BRBP	Between Groups	3.828	7	.547	.518	.820
	Within Groups	167.741	159	1.055		
	Total	171.569	166			
BRWC	Between Groups	4.814	7	.688	.632	.729
	Within Groups	172.923	159	1.088		
	Total	177.737	166			
BRSC	Between Groups	3.439	7	.491	.445	.872
	Within Groups	175.399	159	1.103		
	Total	178.838	166			
BRNP	Between Groups	4.240	7	.606	.727	.649
	Within Groups	132.478	159	.833		
	Total	136.719	166			
BRNP2	Between Groups	7.489	7	1.070	.912	.499
	Within Groups	186.487	159	1.173		
	Total	193.976	166			

Appendix E: Ethics review approval

To: Natalia Gilewicz
School of Business: Graduate Studies
Re: REB 2009-033: SOCIAL CAPITAL FORMATION USING ONLINE SOCIAL
NETWORKS: THE IMPACT OF USER MOTIVATIONS AND EASE OF USE
Date: March 20, 2009

Dear Natalia Gilewicz,

The review of your protocol REB File REB 2009-033 is now complete. The project has been approved for a one year period. Please note that before proceeding with your project, compliance with other required University approvals/certifications, institutional requirements, or governmental authorizations may be required.
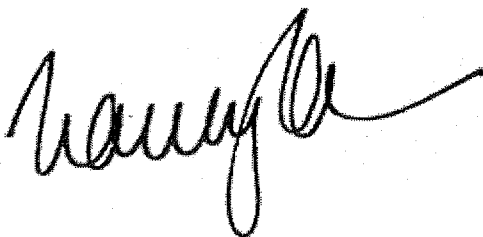
This approval may be extended after one year upon request. Please be advised that if the project is not renewed, approval will expire and no more research involving humans may take place. If this is a funded project, access to research funds may also be affected.

Please note that REB approval policies require that you adhere strictly to the protocol as last reviewed by the REB and that any modifications must be approved by the Board before they can be implemented. Adverse or unexpected events must be reported to the REB as soon as possible with an indication from the Principal Investigator as to how, in the view of the Principal Investigator, these events affect the continuation of the protocol.

Finally, if research subjects are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research.

Please quote your REB file number (REB 2009-033) on future correspondence.

Congratulations and best of luck in conducting your research.

Nancy Walton, Ph.D.
Chair, Research Ethics Board