

THE IMPACT OF SOCIAL MEDIA ON SOCIAL CAPITAL: EXAMINING USE OF  
SMARTPHONES AND SOCIAL NETWORKING SERVICES FOR SOCIAL CAPITAL  
ACCUMULATING

By

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To my beloved family

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Abstract of Thesis Presented to the Graduate School  
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This thesis attempted to explore whether the popularization and diffusion of smartphones have influenced the usage and frequency of use of social networking services as well as whether the usage and frequency of use of social networking services have affected social capital. Putnam (2000) argued that social capital can boost a robust foundation for grassroots democracy. This thesis proposed that the intensity of smartphones and the intensity of social networking services can demonstrate how they influence indicators of social capital (i.e., trust, political participation, organizational memberships, and network diversity). The thesis sought to examine which purposes of smartphones and social networking services use significant impact their intensity. Furthermore, by virtue of a regression model, the thesis also aimed to test the relationships among the intensity of smartphones, the intensity of social networking services, and indicators of social capital.

This thesis used survey data from college students who use smartphones and social networking services at the University of Florida ( $N = 339$ ). Results of paired-samples  $t$ -tests demonstrated that users were more often likely to use smartphones for



communicational purposes than other purposes and overwhelmingly tended to use social networking services to maintain their former connections rather than expand new connections. In addition to multiple regression analyses, the relationships among the intensity of smartphones and the intensity of social networking services as well as indicators of social capital were empirically evidenced. These results imply that smartphones and social networking services can directly, indirectly, and positively contribute to indicators of social capital by offering a new environment for communication play.

## CHAPTER 1 INTRODUCTION

On June 9, 2008, Apple Inc. CEO Steve Jobs gave a keynote speech at the Worldwide Developers Conference in San Francisco. Jobs said, "It's widely believed that this is the phone that has changed phones forever." By introducing the iPhone® 3G, Jobs suggested that thanks to new information technologies like GPS, also known as location services, the new iPhone® could transcend the limitations of conventional phones. More recently, according to the IDC research firm (2011), in 2010, 302.6 million smartphones were sold worldwide. This figure is up 74% from 173.5 million in 2009. In addition "there were 100.9 million smartphones shipped during the fourth quarter of 2010, while PC manufacturers only shipped 92.1 million units." This implies that smartphones are becoming more popular and powerful, and that users are using smartphone technologies instead of personal computers as their main communication medium.

Moreover, the diffusion of smartphones, such as iPhone® and Blackberry®, encourages the emergence of mobile social networking applications. It provides social networking friendly platforms to users. Counts and Fisher (2010) said, "In effect, mobile networking services provide an always-on environment for information exchange among members of social networks" (p. 98). This suggests that mobile social networking services can promote real-time interconnection among users.

Notably, the popularity of social networking services has continued to skyrocket. For example, Facebook CEO Mark Zuckerberg wrote that Facebook now has more than 500 million users worldwide. In New York, in 2010, Twitter CEO Dick Costolo offered some updated information at the Conversational Media Summit. Costolo said that

Twitter had more than 190 million registered users tweeting 65 million times a day.

These services enable users to sustain social communities and connect with members of a social network. Furthermore, users of social networking services can freely join online communities based on their purposes or interests and make new connections. In other words, with the advent of new types of communication tools, people are easily and economically able to maintain and extend their social interactions, as well as foster their social capital through these tools' convenient interfaces.

Several scholars have conceptualized the notion of social capital. Despite subtle differences in their concepts, most scholars have identified social networks, norms and civic engagements as significant social capital indicators (Coleman, 1988; Lin, 2001; Putnam, 1995). For example, Putnam (1995) argued that diverse social networks, which are considered as the pith of social capital, can lead to higher generalized trust, reciprocity, and civic engagements, such as community activities and political participation.

During the last decade, with the diffusion of social networking services, some scholars have studied the relations between social capital and social networking services. Steinfield, DiMicco, Ellison, and Lampe (2009) suggested that the intensity of social networking services is closely linked to contact to new friends and bridging social relationships. They described creating and extending social capital within social networking services as a "Bowling Online." This concept is against Putnam's milestone article "Bowling Alone" (1995), which suggested that social capital has declined in the American society.

For a social capital interest, social networking services can play a significant role in maintaining and extending social capital. In general, social capital is not only created in a network of heterogeneous interaction, but is also found in “strong-ties” networks, such as family, intimate friends, and colleagues (Putnam, 2000). Based on the characteristics of smartphones, social capital, and social networking services noted above, this study pays attention to how smartphones influence social networking services, and the ways in which services affect diverse social capital resources like trust, networks, and civic engagements.

**Purpose of the study:** The main purpose of this study is to examine whether social capital is facilitated by new types of communication technologies, such as smartphones and social networking services. In terms of smartphone-mediated communication, the convenient interface of smartphones will be likely to intensify the usage and frequency of many sorts of applications such as games, music, and the Internet. This suggests that smartphones can fortify the intensity of the social networking services. While a meaningful number of people use social networking services via smartphones, few empirical studies have tried to identify the correlation between such devices and such services. Thus, this study explores the relationships of how smartphones motivate users’ intent to participate actively in social networking services and between the intensity of smartphones and the intensity of social networking services.

Furthermore, this study explores the ways in which people interact with and acquire social capital through social networking services. Ellison, Steinfield, and Lampe, (2007) developed a Facebook intensity scale in order to measure social networking

services' usage more effectively than time or frequency measurements. By adapting the scale, the intensity of social networking services was measured to examine the correlation between social networking services and social capital. In terms of social capital, the study categorizes four indicators of social capital: trust, political participation, civic engagement (membership in an organization), and networks.

What role do smartphones play in the intensity of social networking services? How do social networking services affect social capital, such as trust, political participation, organizational memberships, and network diversity? To answer these questions, a survey was conducted from April 2011 to May 2011. This study focuses on the social and technological impact of smartphones and social networking services in a group of college students. Therefore, this study examines whether the popularization and diffusion of smartphones influence the usage and frequency of use of social networking services, and whether the intensity of social networking services influences social capital.

## CHAPTER 2 REVIEW OF LITERATURE

This chapter examines the conceptual features of smartphones, social networking services, and social capital. The chapter presents a review of literature on diffusion and popularity of smartphones and social networking services, as well as concepts, resources, and definitions. The review of literature also provides insight into the concepts, definitions, resources, and measurements of social capital indicators, and explains how smartphones affect the intensity of social networking services, which can be conceptually associated with social capital. Finally, this chapter explores whether the intensity of social networking services empirically influences social capital indicators, such as trust, political participation, organizational memberships, and network diversity.

### **Social Capital**

#### **Defining Social Capital**

The concept of economic capital has been considered essential in communities, societies, and nations because of its relation to both economic growth and capitalism. However, other types of capital are being watched as significant predictors: cultural capital, educational capital, and social capital (Bourdieu, 1979, 1986, 1987). In particular, social capital is a significant factor in economic and social development.

The term “social capital” was coined by Bourdieu in 1979, although Hanifan (1916) first claimed that social capital is closely related to social interactions like community engagement among students in a school. Bourdieu (1986) defined social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationship of mutual acquaintance and recognition” (p. 248). In other words, social capital resources are derived from

social networks. Since then, several scholars have proposed a variety of definitions of social capital (Coleman, 1988, 1990; Lin, 1982, 1999, 2001, Putnam, 1993, 1995, 2000).

Some scholars state that social capital stems from social networks and relationships such as community involvement and participation (Bourdieu & Wacquant, 1992; Coleman, 1988, 1990; Portes, 1998; Putnam, 1993, 1995, 2000). In other words, the social capital resources from social networks are based on the networks themselves in structural and functional perspective. Coleman (1988) defined social capital as related to the network of relations among actors, and emphasizes social norms, networks, and organizations that help to obtain mutual benefits. This perspective sees social capital as the resources of social norms and relations embedded in networks to bring about civic engagement. Moreover, Putnam (1995) defined social capital as “features of social life-networks, norms and trust that enable participants to act together more effectively to pursue shared objectives” (p. 665). Focusing on social norms and ties at the community level, social capital can be redefined as “connections among individuals – social networking and the norms of reciprocity and trustworthiness that arise from them” (Putnam, 2000, p. 19).

Other scholars state that social capital derives from social networks themselves. In terms of social capital resources embedded in the social networks, social capital refers to supplementary goods that can be beneficial in reaching individuals’ achievements (Van der Gaag, 2005). Coleman (1988) asserted that social capital is “a variety of different entities, with two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors – whether personal or corporate actors – within the structure” (p. 98). That is, this concept of social capital can be

considered as the total expected value of the profits that this individual can sustain from his social networks to others (Snijders, 1999). Lin (2001) defined social capital as “resources embedded in one’s social networks, resources that can be accessed or mobilized through ties in the networks” (p. 29). Putnam (2000) also agreed on the value of social networks themselves.

Meanwhile, Mitchell and Bossert (2007) asserted that social capital can originate from structural resources embedded in social networks (e.g., organizational memberships), as well as cognitive resources like trust, which can be obtained through social interactions with others.

### **Perspectives of Social Capital**

Two types of perspective of social capital have been theoretically and empirically discussed by sociologists. From their perspective, social capital is “how individuals access and use resources embedded in social networks to gain returns in instrumental actions or preserve gains in experience actions” (Lin, 1999, p, 31). This perspective emphasizes the way that individuals engage in social interactions and how they capture resources embedded in the networks to produce a return (Burt, 1992; Boxman, De Graaf, & Flap, 1991; Lin, 1999; Portes & Sensenbrenner 1993).

According to the organizational perspective, social capital is focused on how organizations achieve social capital as a collective benefit and how such a collective benefit improves the quality of life of the members of that organization (Bourdieu, 1986; Coleman, 1988, 1990; Putnam, 1993, 1995). For instance, Nahapiet and Ghosal (1998) argued that dense relationships among group members can generate collective social capital in terms of interpersonal trust, collaboration, and reciprocity. In short, the



interactions among organizational members are positively related to norms of trust, as well as to other resources (e.g., cooperation, obligation) of an organization.

### **Categorizing of Social Capital**

Social capital has long taken a variety of forms. Putnam (2000) attempted to distinguish two types of social capital: bonding (homogeneous) and bridging (heterogeneous).

Bonding social capital can be produced by strong social ties, such as family members, intimate colleagues, and close friends. Putman (2000) described bonding social capital as sociological “super glue” based on “thick trust” (Coleman, 1988). In general, strong social ties tend to be beneficial when individuals reinforce in-group solidarity and have a similar religion, information, and interests (Granovetter, 1973). In other words, strong ties make people maintain their close social networks and lead to the accumulation of bonding social capital. Thus, bonding social capital provides diverse benefits like community trust and collaboration, thick emotional support, and economic assistance, although it sometimes makes trouble for social diversity and integration (Putnam & Feldstein, 2003).

Whereas bonding social capital places emphasis on individuals’ thick trust, collaboration, and in-group solidarity with internal other individuals to maintain a close relationships, bridging social capital pays more attention to weak ties as a “bridge” with external other individuals for extending diverse networks and information diffusion (Putnam, 2000). It offers a sociological “WD-40<sup>®</sup>”, by which individuals can be linked by socially heterogeneous networks. According to Granovetter (1973), weak ties are better than strong ties when individuals accumulate new information or find jobs. Moreover, weak tie networks have advantages of bridging interaction that is unavailable through

bonding relationships, such as experience diverse cultures, perspectives, opinions, and generalized trust.

Williams (2006) said that "members of weak tie networks are thought to be outward looking and to include people from a broad range of backgrounds" (p. 601). In other words, bridging social capital constructed by weak ties networks produces broader identity and generalized reciprocity. For example, participating in diverse networks promotes the diffusion of information and civic engagement (Fleming, Thorson, & Peng, 2005). Although bridging social capital can be easily accumulated by joining networks, maintaining and extending this social capital tend to be more costly in terms of time and effort than is bonding social capital (Putnam & Feldstein, 2003). Despite these difficulties, bridging social capital can close social distance and lead to the social integration of different networks.

### **A Definition of Social Capital**

By virtue of the dimensions of social capital research, this study defines social capital as social benefits and potentials emerging from social networks that enable individuals to reach their goals through trust, political participation, civic engagement (membership in organization) and network diversity.

Putnam (2000) attempted to categorize social capital according to two main dimensions: bonding and bridging (Ellison et al., 2007; Williams, 2006). Although many scholars have adopted Putnam's categorization, the current study focuses more on the concept of bridging social capital than on bonding social capital as the former, which may be better accumulated by social media, can serve as a sociological "WD-40<sup>®</sup>" among individuals. Social capital may be more effectively promoted by individuals' dynamic and diverse forms of activities, such as membership in an organization,

participation in political issues, online social networking, and blogging. Therefore, the current study does not categorize social capital as bonding and bridging, but rather emphasizes social capital's diverse forms—namely, trust, political participation, organizational memberships, and network diversity.

From the individuals' perspective, the concept of social capital is situated in its capability to explore how individuals accumulate the embedded trust and network diversity, as well as political participation and civic engagement, in social relations. That is, social capital can be described how individuals can sustain consensus and harmony with others in their networks. Thus, well-constructed social networks may lead to higher trust, political participation, civic engagement (membership in an organization) and networks diversity.

### **Indicators of Social Capital**

This study proposes and defines the following resources of social capital from the individual perspective. In general, social capital is considered as an insubstantial asset derived from individuals' social interaction (Grootaert & Bastelaer, 2002). Social capital can be categorized in terms of networks and trust (Coleman, 1990; Lin, 2001; Paxton, 1999; Putnam, 2000; Snijders, 1999; Van der Gaag, 2005). Several scholars have categorized social capital as dimensions of political participation and civic engagements (Magee, 2008; Pasek, More, & Romer, 2009; Putnam, 1995, 2000).

### **Trust**

Several scholars pointed out that trust, as one of the social capital resources, refers to individuals' positive faiths in the honesty and reliability of other individuals (Coleman, 1990; Paxton, 1999; Magee, 2008). Putnam (2000) noted that trust can be described as a lubricant to maintain and foster social relationship among individuals. It

leads to individuals' collaboration to proceed and harmonious discussion process when individuals make significant decision. That is, trust is "a lubricant that eliminates the need for third party ensures or enforcers" (Paxton, 1999, p. 98). According to Poortinga (2006), trust is a significant social capital. "Trusting and socially active individuals more often report good or very good health in countries with high levels of social capital than individuals with lower level of trust" (p. 292). As such, level of trust seems quite related to individuals' social capital.

From the individual viewpoint, trust can be strengthened or weakened by interacting with other individuals, which results in positive or negative beliefs of relationships. Trust can also be accumulated by strong relationships and others who are connected with weak ties (Putnam, 2000). Thus, this study focuses on generalized trust, including individuals' trust in other general individuals as well as trust in their particular individuals, such as particular members of groups and communities.

### **Political participation**

Political knowledge and participation have considered as one of the social capital in terms of communication about politics within an individuals' social interaction (La Due Lake & Huckfeldt, 1998; Pasek et al., 2009; Putnam, 2000). For instance, decreases in political participation have been a matter of perpetual concern in American society (Putnam, 2000) as the low level of political knowledge and education are more likely to decline political participation while also undermining democracy.

In terms of social capital, although many scholars have sought to categorize social capital as two main dimensions—namely, bonding and bridging—some scholars have suggested linking social capital as an additional dimension. According to all of the concepts of linking social capital, political participation can be considered a critical

resource encompassing “norms of respect and networks of trusting relationships between people who are interacting across explicit, formal or institutionalized power or authority gradients in society” (Szreter & Woolcock, 2004, p. 655). For example, Morales (2002) suggested that political participation can lead to encouraging electoral participation and fostering active attitude toward politics and democracy. As such, it seems to be closely associated with organizational memberships, which are also regarded as the pith of social capital, thereby facilitating more participatory and informed political culture.

At the individual level, high level of political knowledge affects dynamic political participation and it provides a strong foundation for democracy (Putnam, 2000). La Due Lake and Huckfeldt (1998) suggested that political participation is facilitated by political connections within individuals’ networks. Thus, this study focuses on political participation, which refers to civic socialization mechanisms that fortify trust, political knowledge, and organizational memberships within individuals’ networks. Through active political participation, individuals may build the kind of citizenship that creates a more democratic society.

### **Organizational memberships**

Civic engagement is “the degree to which people become involved in their community, both actively and passively, including such political and organizational activities as political rallies, book, and sports club” (Quan-Haase & Wellman, 2002, p. 113). There has been debate as to whether or whether civic engagement has declined in American society. Putnam (2000) has linked declining civic engagement to a decline in collective social activities. In contrast, Fischer (2001) argued that civic engagement resources did not show a consistent decline insofar as resources of socializing and

visiting did not decline. In terms of civic involvement, the results can fluctuate, depending on concept, measure, and contemporary setting. In recent years several scholars have explored whether or not civic engagement resources are facilitated by new communication media, such as the Internet and social networking services. That is, social media can play an important role in civic engagement.

Putnam (2001) pointed out that many different forms of membership in organization allow individuals to strengthen their social relationships and activities. Through diverse memberships in organizations such as charities, or in social service activities, environmental organizations, and professional or academic organizations, people can share information, build trust, and participate in social activities. Magee (2008) also examined civic engagement in order to measure the relationship between membership in organizations and civic participation. In addition, several scholars have identified the new communication medium as an “accelerant” that can promote civic engagement by using social networking services (Ellison et al., 2007; Steinfield et al., 2009).

A diverse organizational membership enables people to enhance their norms of trust, reciprocity, and network diversity. For example, members of a fraternity or sorority can broaden their personal relationships and academic knowledge. It may lead to not only greater civic participation, but also greater network diversity and trust. In other words, civic engagement is positively and significantly associated with other indicators of social capital.

### **Network Diversity**

Networks in the concept of social capital can be explained as relationships and cohesions with other individuals or groups. Individuals engage in connections and

networking in order to gain social benefits (Lin 1999). This concept has been theoretically discussed by many scholars in the past three decades.

Erickson (2004) argued that network diversity is closely associated with other indicators of social capital. McCallister and Fischer (1978) suggested a “name generator” to measure individual level social capital that general, positive social resources embedded in personal social networks. Since then, several scholars have attempted to measure individuals’ network diversity (Lin & Dumin, 1986; Lin, Fu, & Hsung, 2001; Van der Gaag & Snijders, 2005). Magee (2008) measured social networks using the position generator (Lin & Dumin, 1986; Lin, Fu, & Hsung, 2001). In addition, Snijders (1999) proposed a “resource generator,” which included the strong points of other generators, to examine individuals’ network diversity. This concept of resource generator was also used by Van der Gaag (2005) to measure the tie strength which the resources are accessed within individuals’ social networks.

Many scholars have pointed out the significance of bridges in networks in sharing information and knowledge (Burt, 1992; Granovetter, 1973). Although several scholars have stressed networks density or frequency of connecting for the utility of social capital, this study places more emphasis on the diversity of individuals’ networks can promote to share information and help to obtain collective profits. These network activities will be more likely to facilitate social capital among individuals.

### **Overview of indicators of social capital**

Four of social capital resources--trust, political participation, civic engagement, and network diversity--are the main dimensions. This study suggests that social networking services can encourage the maintenance of social capital, and extend social capital for individuals’ trust, political participation, civic engagement, and networks, because social

networking services' particular functionalities (e.g., photo tagging, profile updates, groups, messaging, and chatting), as a means of social relationship, can help to acquire insubstantially social capital. The concepts, definitions, and empirical studies of social networking services and how social networking services are conceptually associated with the indicators of social capital proposed in the following section.

## **Social Networking Services**

### **Defining Social Networking Services**

On February 13, 2011, the young Google executive, Wael Gonim stated in an interview that Egypt's Hosni Mubarak had "stepped down." On CNN, Gonim, who was instrumental in the demonstrations for democracy in Egypt, said "This revolution started online." Gonim added that without social networking services such as Facebook and Twitter, this civil revolution would not have occurred. This revolution implies that, social media allow uncensored information to diffuse worldwide and encourage people to participate in the global citizen movement which leads to "smart democracy."

Although social media have become an indispensable tool for communication, there have been a few academic attempts to define social networking services because of their short history. However, the interests and studies conceptualizing social networking services have increased over the past decade.

Boyd and Ellison (2007) defined social networking sites as "web-based services that allow individuals to 1) construct a public or semi-public within a bounded system, 2) articulate a list of other users with whom they share a connection, and 3) view and traverse their list of connections and those made by others within the system" (p. 211). Richter and Koch (2008) defined social networking services as "application system that offer users functionalities for identity management (i.e., the representation of the own



person, e.g., in form of profile) and enable furthermore to keep in touch with other users (and thus the administration of own contacts)” (p. 87).

Likewise, Steinfield et al. (2009) focused on sharing content, such as friends’ lists, photos, and newsfeeds, as a fundamental capability of social networking services. That is, most social networking sites are web-based and provide a variety of ways for users to interact, such as e-mail and instant messaging services. In other words, social networking services focus on building online communities of people who share interests, political views, and activities, or who are interested in exploring the interests and activities of others.

Although Ellison et al. (2007) disagree as to whether e-mail, blogging, and online messaging are included in social networking services, this study defines social networking services as specific web-sites, such as Facebook, Twitter, MySpace, for supporting social interactions and creating new diverse social networks.

### **Perspectives of Social Networking Services**

Social networking services can serve as a communication tool for information-sharing, identity management, and contact management (Richter & Koch, 2008). Among these functionalities, most users of social networking services rely on these sites to keep in touch with people they already know offline or to make new friends (Ellison et al., 2007; Steinfield et al., 2009). For example, Gladwell (2010) noted that platforms of social networking services are built around weak ties. “Twitter is a way of following (or being followed by) people you may never have met. Facebook is a tool for efficiently managing your acquaintances, for keeping up with the people you would not otherwise be able to stay in touch with” (p. 2). In other words, social networking services support both the maintenance of social connections and the formation of new networks.

Nevertheless, each social networking service has unique features. There is some debate as to whether social networking services encourage people to broaden their networks or maintain or reinforce existing relationships.

Some scholars have argued that social networking services allow users to extend and broaden their new social networks. Resnick (2001) suggested that social networking services now include unique features, such as photo directories, search, and distribution lists. These instruments may allow for the establishment of new relationships through social networking services. In turn, these new connections may differ from offline relationships. Social networking services enable people to participate in online communities and to make new friends easily because it is easier to connect with people of other backgrounds (Pinkett, 2003).

With Twitter, an online social networking service used by millions of people worldwide, users can build new networks. For example, Java, Finin, Song, and Tseng (2007) explained that Twitter allows users to “follow” members who are their “friends.” Someone who is not a friend of a user but “follows” his or her updates is a “follower.” Thus, connections can either be reciprocated or one-way. In other words, Twitter users may keep in touch with friends, family, and celebrities on their friend or follower lists. In addition, even unfamiliar users can easily add friends or be added as a friend since this system offers a user-friendly interface. In other words, social networking services promote new connections, since these services provide an alternative way to keep in touch with new others who have similar interests or goals (Ellison et al., 2007; Horrigan, 2002; Parks & Floyd, 1996).

By contrast, from the perspective of maintaining and reinforcing, other scholars asserted that social networking services enable users to reinforce existing networks and maintain offline relationships. They also found that individuals are more inclined to share their interests with not new people but intimate people (Mandelli, 2002; Preece, 1999; Stolle, 1998). Price, Nie, and Cappella (2002) found that social networking services extend and maintain both original and offline social interactions. Furthermore, Boyd and Ellison (2007) suggested that most users of social networking services are not necessarily networking or making new relationships; rather, they are communicating with people who are already a part of their social networks.

Several scholars have turned their attention to Facebook, the world's most popular social networking service. Facebook is, a rich site for scholars interested in the influences of social networks due to its heavy usage patterns and technological capacities that bridge online and offline connections. For instance, Facebook users can present themselves through an online profile, accumulate "friends" who can post comments on each other's pages, and view other users' profiles. In addition, Facebook members can join virtual groups based on common interests; find what they have in common with others users; and learn others' hobbies, interests, musical tastes, and romantic relationship statuses. Facebook can be used sustain existing offline networks or solidify offline relationships, as opposed to extending new networks (Ellison et al., 2007).

Social networking services allow people to keep in touch with one another and these services have become embedded in the lives of their users. For example, Choi (2006) found that 85% of the respondents "listed the maintenance and reinforcement of

pre-existing social connections as their main purpose for Cyworld Use” (p. 181).

Accordingly, the perspective of maintaining and reinforcing suggests that users of social networking services search for people with whom they have an offline connection more than they look for strangers to meet (Ellison et al., 2007). In other words, social networking services are not intended to do more than broaden new networks but to bond online and offline connections.

### **Social Networking Services and Its Empirical Evidence on Social Capital**

Social networking services can be traced to a 1997 website called SixDegrees.com, which enabled users to design profiles or a list of friends (Boyd & Ellison, 2007). Since then, many social networking services have become immensely popular and then disappeared. With the rapid development of information technologies, shifts in consumption patterns of social networking services users have fluctuated according to tastes. Most recently, with the diffusion of new social networking services such as Facebook, and Twitter, studies of social networking services have rapidly emerged in association with social capital resources.

Many studies have noted that the social networking services have many technological features, and can build social capital resources. Nie (2001) claimed that the Internet not only precludes deeper interaction among individuals, but it does not release users from its virtual world. Conversely, several scholars have argued that the diverse functions of the Internet like chatting and emailing enables users to share information or ideas and to make up for face-to-face connections (Wellman, Quan-Haase, Witte, & Hampton, 2001; Wellman, Boase, & Chen, 2002; Quan-Haase & Wellman, 2004). In particular, online chatting allows users to broaden their political and social horizon and to learn coordination (Spears, Postmes, Lea, & Wolbert, 2002). Since

then, with the advent of social networking services, many scholars have explored relations between social networking services and social capital.

Social capital is “an important indicator of significance and position of particular members within the online social networks” (Kazienko & Musial, 2006, p. 224). Thus, broadening new or reinforcing the existing networks can enable individuals and groups to obtain profits and increase social capital. For example, Ellison et al. (2007) examined the relationship between intensity of Facebook and three dimensions of social capital: bonding, bridging, and maintenance. This study showed that intensity of Facebook is positively associated with the three dimensions of social capital. Bridging social capital is the most strongly related to intensity of Facebook. Facebook can therefore offer greater profits for users by extending their relationship and broadening diverse networks. Steinfield et al. (2009) explored the relationship among use of Facebook, bridging social capital and psychological well-being. The results indicated that use of Facebook is strongly linked to bridging social capital resources. This implies that social networking services can allow users to form the diverse and heterogeneous networks that are social capital resources.

Likewise, Williams (2006) hypothesized that the Internet continues to decrease social capital pointing out that all of the increased social capital resources have been gained among heavy Internet users—namely, early adopters, well-educated, and young users. However, Williams demonstrated that the Internet offers a possible new site of social activities for accumulating diverse social capital resources. This implies that the Internet may help to secure social benefits for individuals and promote greater social capital. Pasek et al. (2009) explored the relationships between social networking

services users and political knowledge, trust, and civic engagement of social capital. This study suggested that social networking services users are more likely to involve civic participation and trust than non-users.

As previously discussed, social networking services positively relate to social capital indicators, although some negative points of view have emerged. Indeed, social networking services enable users to sustain and create social capital resources. Thus, this study pays attention to these services' diverse functionalities and may influence individuals to sustain interpersonal trust, better political participation, active civic engagement, and network diversity.

## **Smartphones and Mobile Communication**

### **Background of Smartphones**

An undeniable growth of mobile communication in recent years, that allows individuals to communicate with others without spatial and temporal constraints, is related to the diffusion of smartphones like BlackBerry® and iPhone®. For example, comScore (2011) found that four of the top five acquired cellular phones in the U.S were smartphones: iPhone® 3GS/4G, BlackBerry® Curve 8530, and Droid™. The finding also showed that new phone consumers who were interested in smartphones cared about the quality of network and the cost of data plans.

Smartphones are mobile phones “which incorporate advanced capabilities; they are an advanced form of a wireless mobile device that can function like a computer by offering features such as personal digital assistant, internet access, email, and Global Positioning System” (Backer, 2010, p.21). Karlson, Meyers, Jacobs, Johns, and Kane (2009) claim that smartphones are well-suited to promote capability tasks beyond the original functionalities of text messages and voice calls, with enhancing accessibility to

the Internet. In this sense, smartphones are not only devices for social networking (e.g., voice calls and text messages), but also reflect the diverse abilities of mobile OS, applications, and multimedia.

### **Mobile Communication and Its Empirical Evidence**

ComScore Inc. described 2010 “as a year of dynamic growth in mobile driven by acceleration in mobile media consumption across markets” (2011, p. 2). With the diffusion of mobile communication technology, this medium is spreading out worldwide faster than any other medium to date (Castells, Fernandez-Ardevol, Qiu, & Sey, 2007). According to Stüber (2001), mobile environments have undergone a momentous evolution since the first cellular telephone appeared in the early 1980s. Since then, there have been tremendous changes, such as the emergence of wireless networks and smartphones.

McLuhan (1964) referred to the literature focusing on technological aspects of media, proposing that research focus on the medium itself, not its content. In addition, a medium affects society based on the content delivered as well as the medium’s characteristics. Furthermore, Meyrowitz (1985) described technologies as having affected individuals’ daily social relations, using television as an example. This study argued that television has been responsible for a significant cultural shift toward new and egalitarian social interactions. These findings imply that new technologies allow individuals to observe others in an unprecedented fashion. In other words, such technologies can have a positive effect on new formats of communication.

In terms of the early years of computer-mediated communication networks’ popularity, the early community networks were promoted by regional governments or by community activists. Thus, network’s ability to establish two-way communication had

become restricted and narrow. However, recent social networks which are based on new communication media pay more attention to how a medium embeds itself within a message, creating a symbiotic relationship. For example, Spears et al. (2002) reviewed the impact of the Internet-mediated communication on social effects, arguing that new communication media may in fact fortify social ties as well as support power inequalities. This study also examined how online chatting allows online users to broaden their political and social horizons and learn coordination. Rheingold (2003) suggested that “smart mobs,” based on new IT infrastructure, allow people to act together in new ways and in situations in which collective action had not been possible before. This study also indicates that smart mobs are not always desirable, because “lynch mobs” and “mobocracies” continue to perpetrate atrocities.

Scholars have also become interested in studying mobile devices. Raento, Oulasvirta, and Eagle (2009) outlined the significance and potential of smartphones. Their study described how smartphones enable users both to communicate with people whom they have never met and to interact with remote users. Smartphones have many useful characteristics, such as mass storage capacity, numerous applications, a built-in networking system, and even a primary-communication tool. Counts and Fisher (2010) focused on the impact of a mobile social networking services and how the users share everyday information in informal social settings. This study showed that the emergence of mobile social networking applications such as Facebook and Twitter that can be accessed through a mobile Web browser or smartphones applications. This study also suggested that mobile services have become popular technology-mediated communication modalities. According to Yee and Hargis (2009), smartphones have not



yet been used for educational purposes, but for social ones. With the advent of social networking services such as Twitter, users might be allowed to use smartphones for “back-channel” discussions. In particular, Twitter could be used to post anonymous opinions or questions to peers or lecturers in real time without the constraints of time and space. These findings imply that social networking services through mobile applications can assist with the earning social capital resources due to their characteristics as handheld devices.

As noted above, technology-mediated communication like radio, television, online, and mobile have been topics of many theoretical and empirical discussions. Such studies have been influenced by contemporary sociological, economical, and cultural factors because of rapid technological development and social change. To date, smartphones and mobile are undoubted pervasive communication medium that facilitate communication beyond other technology-mediated communication. Focusing on review of literature which is linked to mobile communication and smartphones, this study sees the smartphones as a tool and capability that enables users to share information, serve educational or entertainment purposes, and keep social networks.

### **Research Questions and Hypotheses**

Thus far, this study has reviewed the literature on, mobile communication, online social communication, and a variety concept of social capital. By virtue of several reviews of literature, this study raises research questions and hypotheses about smartphones, social networking services, and social capital resources.

Several scholars are interested in how and to what extent smartphones constitute a new mobile communication technology. For example, Schmidt, Peters, Lamour, and Albayrak (2008) explored how smartphones can be used and what a smartphone

actually is. This study described smartphones as a mobile device that has the features of a cellular phone, a GPS, a MP3 player, an e-book reader, a digital camera, and the Internet. In other words, the multifarious features of smartphones can be used not only for connecting with others, but also for gathering information and enjoying entertainment. Roussos, March, and Maglavera (2005) categorize four platforms of smartphone application: 1) informational service, 2) remote controller, 3) pervasive network hub, and 4) ID token. Thus, in order to examine what categories of functionalities of smartphones can be positively related to intent to use such devices, this study was framed by the following research question:

**RQ1:** What are the purposes of intent to use smartphones (e.g., social network, entertainment, and information), as a mobile communication device?

This study also has discussed whether smartphones can facilitate the intensity (the usage and frequency of use) of social networking services. If the intent to use smartphones and the purpose of social networking can empirically become both mutual relations, this may lead to dynamic participation in social networking services. Smartphones may play a significant role in intensifying involvement in online social networking services. For instance, comScore (2011) reviewed that approximately 24% of mobile users were most inclined to connect with social networking sites or blogs in the U. S. via their mobile device. In particular, “in December 2010, 57.3 percent of smartphone users in the U. S. (36.2 million users) accessed social networking sites or blogs at least once during the month, an increase of 11.2 percentage points versus the previous year” (p. 23). This review implies that people who are in possession of smartphones will be more likely to access social networking services because of its convenient interface. That is, the usage and frequency of use of smartphones will be

linked to access to social networking services. Therefore, the following hypothesis is proposed:

**H1:** Intensity of smartphones use will be positively related to intensity of social networking services.

Several scholars have categorized the core functionalities of social networking services. Richter and Koch (2008) suggested two main functionalities for identity management and keeping in touch. The functionality of social networking services for keeping in touch falls into two categories: 1) interaction with everyone, and 2) connection with one's closed communities. This classification implies that people access social networking services to broaden new connection or to sustain existing and closed ones. For example, Steinfield et al. (2009) found that some users who were actively connected with social networking services were more likely to meet entirely new people than intimate friends, although most users in an organization preferred meeting intimate friends to meeting new people. From the network perspective, in order to explore whether individuals access social networking to maintain existing and former network or to extend new network services, the following research question is designed:

**RQ2:** What role do social networking services play (e.g., to maintain existing and former network, and to extend new network), as an online communication medium?

With the advent of the Internet-mediated communication, the central question is whether such communication helps or hinders the creation of social capital. Some scholars have argued that online communication will isolate individuals from their networks because of cyber bullying stemming from online anonymity and the growing digital divide, ultimately leading to the decline of social capital. (Nie, 2001; Nie & Erbing, 2000). However, others asserted that such communication would support social

networks and broaden social capital (Bargh & McKenna, 2004; Wellman et al., 2001). In particular, several scholars have put forward online social networking services like Facebook as means of ratifying or eliminating of social capital (Donath & Boyd, 2004; Ellison et al., 2007; Williams, 2006). Because functionalities of cross the spatial and temporal constraints, and convenient interfaces on such services may open new possibilities of social capital areas. Therefore, in order to explore whether social networking services can positively or negatively affect social capital, the following research question is suggested:

**RQ3:** How does intensity of online social networking services, as an online communication medium, influence social capital resources (e.g., trust, political participation, civic engagement, and networks)?

Finally, this study reviewed trust, political participation, civic engagement and networks as pivotal resources of social capital. In particular, Putnam (2000) suggested that civic engagements can be affected by norms of trust and reciprocity, and networks. In other words, trust and diverse networks in each individual will produce dynamic civic engagement, political activity, and participation in organizations. Furthermore, organizational memberships can provide a diverse network, in which individuals may realize how a variety of organizational memberships sustains their civic involvements. In short, the four indicators of social capital are quite complementary.

As this study has stated, social networking services' user friendly interfaces, intensity of such services can have a positive effect on trust, organizational membership, and networks. Without spatial and temporal constraints, social networking services can be of best medium for individuals to maintain and create their social capital. Therefore, the following hypotheses are proposed:

**H2a:** Intensity of smartphones use will be directly and positively related to trust.

**H2b:** Intensity of social networking services use will be positively related to trust.

**H2c:** Intensity of smartphones use via intensity of social networking services use will be indirectly and positively associated with trust.

**H3a:** Intensity of smartphones use will be directly and positively related to political participation.

**H3b:** Intensity of social networking services use will be positively related to political participation.

**H3c:** Intensity of smartphones use via intensity of social networking services use will be indirectly and positively associated with political participation.

**H4a:** Intensity of smartphones use will be directly and positively related to organizational memberships.

**H4b:** Intensity of social networking services use will be positively related to organizational memberships.

**H4c:** Intensity of smartphones use via intensity of social networking services use will be indirectly and positively associated with organizational memberships.

**H5a:** Intensity of smartphones use will be directly and positively related to network diversity.

**H5b:** Intensity of social networking services use will be positively related to network diversity.

**H5c:** Intensity of smartphones use via intensity of social networking services use will be indirectly and positively associated with network diversity.

## CHAPTER 3 METHODS

This chapter presents the research methodology and data that were used for this study. In order to explore the research questions and hypotheses which were set in the previous chapter, this study used sampling procedure, measures, pretest and survey administration, and statistical methods.

### **Sampling Procedure**

The population of this study consisted of University of Florida undergraduates and graduate students. To ensure a representative sample, a list of registered students from registrar's office was used as the sampling frame. An e-mail invitation was sent to these students. When selected students did not reply the initial e-mail, a follow-up e-mail was sent to enhance the survey participation rate. A total random sample of 496 students from the University of Florida was collected via e-mail questionnaires in the summer course of 2011.

In general, the response rates of mail or e-mail survey are fairly low due to no direct incentive to participants. Moreover, mail is also the slowest form of survey and e-mail survey cannot ensure an identification of participants. Nevertheless, according to Wimmer and Dominick (2006), the response rates of e-mail survey are usually a little higher than mail one and also time to data collection can be saved by sending e-mail freely and quickly. Thus, all 496 surveys were collected by e-mail with a brief description of purpose of the study and direct incentives.

### **Questionnaire Development**

This study conducted a cross-sectional survey to investigate research questions and hypotheses. When it comes to the cost and time, e-mail survey is more reasonable

and will yield a large sample with a quick response rates. According to Wimmer and Dominick (2006), the number of questions will be easier to complete with e-mail survey than with telephone or mail ones. The survey questionnaire included a consent form, cover letter, a title page, and several questionnaire pages.

### **Measures**

Four sets of measures were used in this study: (1) the intent and intensity of use of smartphones, (2) the intent and intensity of use of social networking services, (3) social capital indicators such as trust, political participation, organizational memberships, and network diversity, and (4) demographics and economic indicators. The measures are described below.

#### **Smartphones**

This study revised and developed the scale based on category in iPhone® application store to measure the purpose of use smartphones. The original consists of 20 categories in iPhone® application store was re-designed as three dimensions to gauge intent to use smartphones: 1) the purpose of communication (e.g., give a call, send text message, using online social networking services), 2) the purpose of entertainment (e.g., game, music, sports, photography), and 3) the purpose of information (e.g., education, e-book, weather, news, navigation and the Internet). Possible responses were scored along a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5).

Furthermore, this study adopted and revised the scales of Facebook Intensity (2007) to measure the intensity of smartphones. In terms of similarities between social networking services and smartphones as new types of communication tools, the Facebook Intensity scale may be more applicable and better suited to gauge the

intensity of smartphones. Thus, the intensity of smartphones scale consists of six items designed to gauge the extent to which the respondents were actively involved in smartphones usage. Five items of intensity of smartphones were presented by asking respondents to rate on a five-point Likert scale (1=strongly disagree, 5= strongly agree). One item was accessed by an open-ended question (e.g., on average, about how many minutes per day have you spent on smartphones).

### **Social Networking Services**

To gauge the purpose of use social networking services in the perspective of network, Steinfield et al. (2009) designed intent to use social networking services in terms of two main dimensions: 1) use of social networking services to maintain existing and former network (e.g., I use social networking services to communicate with family, former colleagues, and intimate friends, and I use social networking services to keep up with my former existing network) and 2) use of social networking services to extend new network (e.g., I use social networking services to make new people with sharing similar interests and information, and I use social networking services to get to know people I would otherwise not meet at existing network). Possible responses were measured along a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5).

Moreover, in terms of the usage and frequency of use of social networking services, the scales of Ellison et al.’s Facebook Intensity (2007) were adapted and modified to access the intensity of social networking services. Intensity of social networking services was measured by seven statements that asked respondents to present how they were actively engaged in social networking services usage. Five items were measured by a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). Two items were gauged by open-ended questions (e.g., on



average, about how many minutes per day have you spent on social networking services and number of social networking services connections).

### **Social Capital Indicators**

Four indicators of social capital were utilized in this study: (1) trust, (2) political participation, (3) organizational memberships, and (4) network diversity. The descriptions of measures of social capital resources follow. (Table 3-1)

#### **Trust**

To evaluate trust, this study adopted and modified the items suggested by several scholars (Cook & Wall, 1980; Ellison et al., 2007; Poortinga, 2006; Putnam, 2000; Steinfield et al., 2009; Veenstra, 2000). Trust was accessed by four items: 1) there is someone I can turn to for advice about making very important decisions, 2) there are no several people I trust to solve my problems, 3) most of the time people try to be helpful, and 4) most people cannot be trusted. All four items were measured by a five-point Likert scale (1=strongly disagree, 5= strongly agree).

#### **Political participation**

Political participation was gauged by four items which revised the statements of political knowledge and activity suggested by several scholars (Gozzo & D'Agata, 2010; Klesner, 2002; La Due Lake & Huckfeldt, 1998; Pasek et al., 2009). Four items are: 1) have you ever participated in political demonstrations, boycotts, or marches before, 2) have you watched any political debates on TV, 3) have you aligned yourself with any political party, and 4) have you ever attended at political meeting or rally before. Respondents were asked to answer whether they have done or have not (yes or no).

## **Organizational memberships**

In terms of organizational memberships, this study modified the scale of civic participation suggested by several scholars (Putnam, 2000; Snijders, 1999; Van der Gaag, 2005). Respondents were asked to answer whether they are an “active member”, an “inactive member”, or “not a member” in any different organizational memberships listed. Each item was summed up. Then, respondents were subdivided into a groups of people who are not active member of any organization (coded = 0) and are active member of any organization (coded = 1).

This list consisted of the eight forms of membership in organization: community project; committee some local organization; public meeting on town affairs; literary, artistic, or discussion group; political party or meeting; fraternity or sorority; environmental organization; better government group. This list was revised to apply to college students, and was randomly ordered to minimize bias.

## **Network Diversity**

In addition, to measure individuals’ network diversity, the short version of Resource Generator was adapted and utilized from an original scale proposed by Snijders (1999).

Resource Generator was asked to respondents to answer whether they knew<sup>1</sup> anyone providing access to each of the five items. Respondents were also asked to answer to Resources Generator items presenting access to either (1) at least one person, in any relationship or (0) no person at all.

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<sup>1</sup> The respondents were asked to imagine that personal friends would know the name and/or identification of the person, and both could start a keep in touch with each other.

Table 3-1. Measures

Measures	
Trust	
T-1	Generally speaking, there is someone I can turn to for advice about making very important decisions.
T-2	Generally speaking, there are no several people I trust to solve my problems [R].
T-3	Generally speaking, most of the time people try to be helpful.
T-4	Generally speaking, most of people cannot be trusted. [R]
Political participation	
P-1	Have you ever participated in political demonstrations, boycotts, or marches before?
P-2	Have you watched any political debates on television?
P-3	Have you aligned yourself with any political party?
P-4	Have you ever attended at political meeting or rally before?
Organizational memberships	
O-1	Community project
O-2	Committee some local organization
O-3	Public meeting on town affairs
O-4	Literary, artistic, or discussion group
O-5	Political party or meeting
O-6	Fraternity or Sorority
O-7	Environmental organization
O-8	Better government group
Network diversity	
N-1	Do you know anyone who reads a professional journal?
N-2	Do you know anyone who earns more than \$4,000 monthly?
N-3	Do you know anyone who owns a holiday home abroad?
N-4	Do you know anyone who knows a lot about governmental regulations?
N-5	Do you know anyone who can give advice on matters of law?

Note: [R] indicates reverse-coding.

### Demographics and Economic Items

Respondents were asked to indicate their age, gender, ethnicity, grade, native language, status, and monthly allowance, as well as the total minutes of the Internet use per day. This study also asked respondents 1) whether they currently use smartphones and 2) whether they contemporarily use social networking services using multiple choice questions. In particular, age was coded as a continuous scale and then was categorized into the following groups: 1) younger than 20 (reference), 2) 20 – 25, and 3) older than 25. Gender (male=1 and female=0) was dummy-coded and ethnicity was

originally divided into four categories: 1) White/Caucasian [reference], 2) Black/African American, 3) Hispanic/Latino, and 4) Asian/Pacific Islander. Grade was categorized as five dimensions: freshmen, sophomores, juniors, seniors, and graduate students of the university, and dummy-coded (1 = undergraduates and 0 = graduate students). Native language was originally measured by open-ended question. Then, this was coded as a dummy variable (1 = English and 0 = others). Status was divided into two categories: domestic and international. Then, this was recoded as a dummy variable (1 = domestic and 0 = international). Personal monthly allowance was measured by respondents' report of their total allowance from all sources per month using open-ended question and then was grouped into the following categories: 1) less than \$501 [reference], 2) \$501 - \$1000, and 3) more than \$1000. The total minutes of Internet use per day was coded as a continuous scale and then was divided into the following indices: 1) less than 101min [reference], 2) 101min – 250min, 3) 251min – 400min, and 4) more than 400min.

### **Pretest**

Before conducting the surveys, data for the pretest was collected to improve and refine the quality of the questionnaire. The target respondents consisted of University of Florida undergraduate and graduate students. The purpose of the pretest was to discover any format and wording problems, and to ascertain whether or not they would understand the instructions and questions. A surveyed convenience sample of 30 was retrieved with respondents' feedback. Based on this pretest, revisions to format and wording were applied to the questionnaire.

## **Survey Administration**

This study employed several methods to optimize the response rate and participation. In the final version of the questionnaire, some items were deleted, revised and developed from the results of the pretest. The original 27 items of network diversity were modified to 5 items as most respondents would be more likely to respond insincerely to the original 27 items, which were quite lengthy. The 12 measurements of organizational memberships were also revised to 8 items to improve the reliability and validity among measurements. The survey was then conducted to target respondents.

## **Validity and Reliability Tests**

Validity and reliability tests should be conducted to ratify the quality of measurement in empirical research. Internal validity is the degree to which a measurement reflects the real meaning of the variable of interest. That is, validity attempts to measure what is supposed to be measured. According to Wimmer and Dominick (2006), validity can be categorized as face, predictive, concurrent, and construct. To find the common factor among social capital variables, empirical researchers usually employ the factor analysis. Therefore, factor analysis was conducted in this study to test the validity of the social capital indicators, the intensity of social networking services use, and the intensity of smartphones use.

The reliability test was conducted to test data which was collected for the present study. Wimmer and Dominick (2006) noted that reliability is “the property of a measure that consistently gives the same answer at different times” (p. 450). This is the degree of correlation among the items that make up the scale. Of the several sorts of reliability, this study employed Cronbach’s alpha coefficient, which is one of the most commonly used indicators of internal consistency.

## **Data Analyses**

In order to examine the research questions and hypotheses, seven types of statistical analyses were performed; descriptive, Cronbach's alpha, factor analysis, paired- samples T-test, linear regression, logistic regression, and Poisson regression. All analyses were conducted using STATA v.11 statistical package (StataCorp., College Station TX).

Demographics and economic variables were described. Furthermore, participants' the Internet usage, their smartphones ownership, and availability of social networking services were also described. In addition, respondents' the intensity of smartphones use and their intent to use were described. Likewise, respondents' the intensity of social networking services use and their intent to use, as well as number of connections were described. The survey instrument included measures of trust, political participation, organizational memberships, and network diversity. That is, of all the collected data were described.

To analyze the research questions and hypotheses pertaining to the empirical common factor and reliability—namely, items of the intensity of smartphones, items of the intensity of social networking services, and items of trust of social capital—factor analysis and Cronbach's alpha were performed. In addition, to test the homogeneity among items of political participation, a Mokken scale analysis was conducted using R.

T-tests were performed to confirm the intent to smartphones use and social networking services use. Among the several ways to conduct t-test, this study used paired-samples t-test analyses.

Finally, linear regression, logistic regression, and Poisson regression analyses were conducted for the dependent variables, such as the intensity of smartphones use,

trust, organizational memberships, political participation, and network diversity. More specifically, linear regression analysis was conducted for continuous dependent variable (e.g., intensity of social networking services and trust). Logistic regression analysis was conducted for binary outcome (e.g., organizational memberships). Poisson regression analysis was conducted for count outcome (e.g., political participation and network diversity). For example, this study specifies the following basic model:

$$y_i = B_0 + B_1 SM_i + (B_2 SNS_i) + B_3 X_i + u_i$$

$$i=1, \dots, 339$$

Where  $y$  is the relevant dependent variable for individual  $i$ ,  $SM$  is the intensity of smartphones variable,  $SNS$  is the intensity of social networking services variable, and  $X$  is a vector of control variables. The  $B$ 's are the regression parameters to be estimated and  $u$  is the error term.

When conducting the regression analysis for each social capital variable, intensity of social networking services also included as an independent variable. In addition to the analysis of intensity of social networking services, two models for each social capital variable are specified: Model 1 without intensity of social networking services as an independent variable and Model 2 with intensity of social networking services as an independent variable. This difference allows for the distinction of intensity of smartphones both directly and indirectly through intensity of social networking services and effects on each social capital variable.

## CHAPTER 4 RESULTS

This chapter presents the results of the research questions and hypotheses as well as a description of the collected data. Descriptive statistics, factor analyses, Cronbach's alpha, the Mokken scale analysis, and regression analyses (e.g., linear, logistic, and Poisson) that were performed are also presented.

### **Descriptive Statistics**

Before examining the research questions and hypotheses, this study confirmed descriptive statistics. Among all 496 collected survey questionnaires, 42 questionnaires could not be used because they were substantially incomplete. Thus, 454 samples were considered to be usable questionnaires. Among these 454 samples, most respondents were registered members of one or more social networking services (96.3%), with the majority using Facebook the most (82.8%). In addition, 342 respondents (75.3%) use or have a smartphone. However, 115 questionnaires reported that respondents were neither social networking services users nor smartphones users. Thus, ultimately 339 (N=339) samples were considered in the analyses.

### **Demographics and Economic Items**

Table 4-1 shows that respondents' descriptive statistics differed according to age, gender, ethnicity, grade, native language, status, monthly allowance, and hours of the Internet use per day.

Among the 339 respondents, the average age was 21.9 years old; age ranged from 17 to 40 years old. Gender was almost evenly split, with 51% of respondents being males and 49% being females. The 339 respondents categorized themselves into the following race categories: White/Caucasian (53.1%), Asian/Pacific Islander (19.8%),



Black/African American (14.5%), and Hispanic/Latino (11.8%). Almost 77.9% of the respondents were undergraduates—namely, freshmen (10.3%), sophomores (19.2%), juniors (27.1%), and seniors (21.2%). Nearly 73% of the 339 respondents' native language was English, and more domestic students (82.3%) participated in the survey than international students (17.7%). With regard to monthly allowance, which ranged from \$80 to \$4,000, respondents received an average of \$706. The 339 respondents reported using the Internet about 3 hours 35 minutes on average per day. Their minimum amount of Internet use was 15 minutes per day while the maximum was 20 hours per day.

Table 4-1. Sample demographics and economics items

Demographics	Mean or % (N)	S.D.
Age	21.9	3.69
Gender		
Male	51% (174)	
Female	49% (165)	
Race:		
White/Caucasian	53% (180)	
Asian/Pacific Islander	21% (70)	
Black/African American	14% (49)	
Hispanic/Latino	12% (40)	
Grade:		
Undergraduates <sup>1</sup>	78% (264)	
Graduate Students	22% (75)	
Native language:		
English	73% (246)	
Non-english	37% (93)	
Status:		
Domestic	82% (279)	
International	17% (60)	
Monthly allowance	\$706	\$549
Hours of the Internet use per day <sup>2</sup>	3hours 35 min.	2:46

Note: <sup>1</sup>represents undergraduate included freshmen, sophomores, junior, and seniors; <sup>2</sup>converted from original scale (e.g., 100 minutes = 1 hour 40 minutes).

## Intensity of Smartphones

The intensity of smartphones scale (Cronbach's alpha = .84) was developed to measure usage more effectively than based on hours of use and frequency. This scale constituted one self-reported question (i.e., the amount of time spent on smartphones per day) and five attitudinal questions on a five-point scale regarding how respondents were emotionally associated with smartphones and how smartphones were connected to respondents' daily activities.

Table 4-2. Intensity of smartphones

Individual items and scale	M	S.D.
<b>Smartphones Intensity<sup>1</sup> (Cronbach's alpha = 0.84)</b>	<b>4.04</b>	<b>0.76</b>
On average, about how many minutes per day have you spent on smartphones? 1 = less than 31, 2 = 31-60, 3 = 61-90, 4 = 91-120, 5 = more than 120	3.29	1.53
My smartphone is part of my everyday activity. <sup>2</sup>	4.40	0.73
I am proud to tell people I am a smartphone user. <sup>2</sup>	3.92	0.98
My smartphone has become part of my daily routine. <sup>2</sup>	4.37	0.76
I feel I am part of the smartphone users' community. <sup>2</sup>	4.01	0.94
I would be disappointed if I cannot use my smartphone for a week because of loss. <sup>2</sup>	4.22	0.99

Note: <sup>1</sup>Individual items were assimilated before taking an average to create the intensity of smartphones scale due to differing item scale between average usage and others. <sup>2</sup>A series of Likert-scale attitudinal items ranged from 1 = strongly disagree to 5 = strongly agree.

As shown in Table 4-2, standard deviation scores and each items' mean values of smartphones intensity ranged from 3.29 for "about how many minutes per day have you spent on smartphones" to, 4.40 for "my smartphone is part of my everyday activity"; other response values were, 3.92 for "I am proud to tell people I am a smartphone user," 4.37 for "my smartphone has become part of my daily routine," 4.01 for "I feel I am part of the smartphone users' community," and 4.22 for "I would be disappointed if I cannot use my smartphone for a week because of loss." Thus, all items for the intensity of smartphones fall above the midpoint of the scale.

## Intensity of Social Networking Services

The intensity of social networking services scale (Cronbach's alpha = .88) was developed to create a better measurement of usage than hours of use and frequency. This scale included two self-reported questions (i.e., the amount of time spent on social networking services per day and the number of social networking services connections) as well as five attitudinal questions on a five-point scale regarding how the respondents were emotionally associated with social networking services and how social networking services were connected to respondents' daily activities.

Table 4-3. Intensity of social networking services

Individual items and scale	M	S.D.
<b>SNSs Intensity<sup>1</sup> (Cronbach's alpha = 0.88)</b>	<b>3.57</b>	<b>0.84</b>
About how many total SNSs connections (i.e., Friends/Followings) do you have? 1 = 0-200, 2 = 201-400, 3 = 401-600, 4 = 601-800, 5 = more than 800	2.75	1.35
On average, about how many minutes per day have you spent on SNSs? 1 = less than 31, 2 = 31-60, 3 = 61-90, 4 = 91-120, 5 = more than 120	2.55	1.47
SNSs are part of my everyday activity. <sup>2</sup>	4.24	0.87
I am proud to tell people I use SNSs. <sup>2</sup>	3.78	1.00
SNSs have become part of my daily routine. <sup>2</sup>	4.09	0.91
I feel I am part of the SNSs community. <sup>2</sup>	3.97	0.93
I would be sorry if SNSs shut down. <sup>2</sup>	3.65	1.08

Note: <sup>1</sup>Individual items were assimilated before taking an average to create the intensity of social networking services scale due to differing item scale among average usage, connections, and others. <sup>2</sup>A series of Likert-scale attitudinal items ranged from 1 = strongly disagree to 5 = strongly agree.

As shown in Table 4-3, standard deviation scores and each item's mean values of the intensity of social networking services (SNSs) ranged from 2.55 to 4.24. In detail, the respondents indicated 2.75 for "how many total SNSs connections (i.e. Friends/Followings) do you have," 2.55 for "about how many minutes per day have you spent on SNSs," 4.24 for "SNSs are part of my everyday activity," 3.78 for "I am proud to tell people I use SNSs," 4.09 for "SNSs have become part of my daily routine," 3.97

for “I feel I am part of the SNSs community,” and 3.65 for “I would be sorry if SNSs shut down.” Therefore, almost all items for SNSs intensity are above the midpoint of the scale. Only the first (M=2.75) and second (M=2.55) items fall below the midpoint of the scale.

### Indicators of Social Capital

Table 4-4 presents the mean and standard deviation score, as well as frequency for each indicator of four dimensions—namely, trust, political participation, organizational membership, and network diversity.

Table 4-4. Social capital indicators

Social capital			
Trust		M	S.D.
T-1	Generally speaking, there is someone I can turn to for advice about making very important decisions	4.29	0.82
T-2	Generally speaking, there are no several people I trust to solve my problems. [R]	3.91	0.86
T-3	Generally speaking, most of the time people try to be helpful.	3.91	0.72
T-4	Generally speaking, most of people cannot be trusted. [R]	3.86	0.92
Political participation		Yes	No
P-1	Have you ever participated in political demonstrations, boycotts, or marches before?	39%	61%
P-2	Have you watched any political debates on television?	84%	16%
P-3	Have you aligned yourself with any political party?	67%	33%
P-4	Have you ever attended at political meeting or rally before?	37%	63%
Organizational memberships		Member	Non-member
O-1	Community project	29.5%	70.5%
O-2	Committee some local organization	19.8%	80.2%
O-3	Public meeting on town affairs	12.7%	87.3%
O-4	Literary, artistic, or discussion group	22.4%	77.6%
O-5	Political party or meeting	10.6%	89.4%
O-6	Fraternity or Sorority	19.5%	80.5%
O-7	Environmental organization	5.0%	95.0%
O-8	Better government group	4.4%	95.6%

Table 4-4. Continued

Social capital			
Network diversity		At least one	Not at all
N-1	Do you know anyone who reads a professional journal?	72.3%	27.7%
N-2	Do you know anyone who earns more than \$4,000 monthly?	81.7%	18.3%
N-3	Do you know anyone who owns a holiday home abroad?	42.5%	57.5%
N-4	Do you know anyone who knows a lot about governmental regulations?	79.9%	20.1%
N-5	Do you know anyone who can give advice on matters of law?	75.5%	24.5%

Note: [R] indicates reverse-coding.

### Validity and Reliability of Measurement Items

As shown in Table 4-5, all Cronbach's alpha values were higher than .80 except for trust (.64). Table 4-5 presents the results of factor analyses of the intensity of smartphones, the intensity of social networking services, and trust of social capital. Each item was subjected to factor analysis, which revealed that the intensity of smartphones presented the presence of one component with eigenvalues exceeding 3, explaining 84% of the variance. Factor analysis for the intensity of social networking services showed the presence of one component with eigenvalues exceeding 3, explaining 86% of the variance. In addition, factor analysis for trust revealed the presence of one component with eigenvalues exceeding 1, explaining 86% of the variance.

This analysis was also performed on political participation, which was measured with four items. The respondents were asked to answer "yes" or "no" to each of the four items. For each question, the respondents have to consider which category describes their political participation and indicate which best fits this question. In addition, the scores of each of four items were calculated into one score.

Table 4-5. Validity and reliability tests

	Factor loadings
<b>Smartphones Intensity (Cronbach's alpha = 0.838)</b>	
On average, about how many minutes per day have you spent on smartphones?	.709
My smartphone is part of my everyday activity.	.778
I am proud to tell people I am a smartphone user.	.729
My smartphone has become part of my daily routine.	.813
I feel I am part of the smartphone users' community.	.710
I would be disappointed if I cannot use my smartphone for a week because of loss.	.616
Eigenvalue = 3.187	
Explained % of Variance = 84.48	
<b>SNSs Intensity (Cronbach's alpha = 0.875)</b>	
About how many total SNSs connections (i.e., Friends/Followings) do you have?	0.555
On average, about how many minutes per day have you spent on SNSs?	0.673
SNSs are part of my everyday activity.	0.866
I am proud to tell people I use SNSs.	0.740
SNSs have become part of my daily routine.	0.855
I feel I am part of the SNSs community.	0.796
I would be sorry if SNSs shut down.	0.753
Eigenvalue = 3.993	
Explained % of Variance = 86.08	
<b>Trust (Cronbach's alpha = 0.637)</b>	
Generally speaking, there is someone I can turn to for advice about making very important decisions.	0.520
Generally speaking, there are no several people I trust to solve my problems. [R]	0.571
Generally speaking, most of the time people try to be helpful.	0.534
Generally speaking, most people cannot be trusted. [R]	0.649
Eigenvalue = 1.304	
Explained % of Variance = 86.42	

Table 4-6 shows an overview of the political participation scale and network diversity scale according to each item. The Mokken scale analysis in *R* revealed that four political participation items formed one reliable scale. In particular, the scalability coefficient *H* has to be at least .3. However, higher values are desirable. The scalability coefficient for the entire scale *H* of the political participation and network diversity

were .59 and .35, which are reliable for the qualification “strong scale.” The reliability of political participation ( $p = .69$ ) and network diversity ( $p = .63$ ) also were reasonable.

Table 4-6. Mokken scale analyses

	Scalability coefficients
<b>Political participation (<math>H = 0.594</math>, <math>P = 0.689</math>)</b>	
Have you ever participated in political demonstrations, boycotts, or marches before?	.548
Have you watched any political debates on television?	.723
Have you aligned yourself with any political party?	.627
Have you ever attended at political meeting or rally before?	.542
<b>Network diversity (<math>H = 0.352</math>, <math>P = 0.632</math>)</b>	
Do you know anyone who reads a professional journal?	.340
Do you know anyone who earns more than \$4,000 monthly?	.355
Do you know anyone who owns a holiday home abroad?	.364
Do you know anyone who knows a lot about governmental regulations?	.307
Do you know anyone who can give advice on matters of law?	.395

## Evidence for Research Questions and Hypotheses

### The First Research Question

The first research question asked the purposes of intent to use smartphones (e.g., social network, entertainment, and information) as a mobile communication device. In order to explore whether users used the device to communicate with people or enjoy entertaining or gather information, this study developed several items as shown in Table 4-7.

Each of the scale items was measured using only a single item. The first scale measured whether respondents used smartphones to make a call, send a text message, send email, and use online social networking services. The second scale measured whether respondents used smartphones for games, music, sports, videos, and photography. The third scale measured whether respondents used smartphones for education, e-books, weather, news, navigation, and the Internet.

Table 4-7 shows the mean and the standard of deviation scores for each items of intent to use smartphones. Although all items are above the midpoint of the scale, respondents reported more smartphones use involving communication purpose (M = 4.68) than entertainment purpose (M = 3.94) ( $t = 16.37, p < .000$ ) or informational purpose (M = 3.88) ( $t = 15.92, p < .000$ ).

Table 4-7. Intent to use smartphones

Individual items and scale	M	S.D.
<b>Communication</b> I use smartphones to communicate with people (e.g., give a call, send text message, email, and using social networking services).	4.68	0.52
<b>Entertainment</b> I use smartphones for entertainment purposes (e.g., game, music, sports, video, and photography).	3.94	0.87
<b>Information</b> I use smartphones for informational purposes (e.g., education, e-book, weather, news, navigation, and the Internet).	3.88	0.99

Note: Individual items ranged from 1 = strongly disagree to 5 = strongly agree, scales constructed by taking mean of items.

### The First Hypothesis

Hypothesis 1 predicted that intensity of smartphones use will be positively related to intensity of social networking services use. In order to examine H1 regarding the relationships between intensity of smartphones and intensity of social networking services, this study performed multiple linear regression analyses. In these regression analyses, the demographics, economics items, and Internet usage were controlled in order to determine the unique variance of intensity of social networking services. By controlling for these variables, the unique effects of the dependent variable could be detected. In addition, this study used the Shapiro-Wilk W test to verify the normality of residuals and the Breusch-Pagan test to check the homogeneity of variance of the residuals. The results indicated that both normality and homogeneity of the residual assumptions were violated. Thus, robust standard error was calculated.



As shown in Table 4-8, this multiple linear regression model was significant ( $F = 24.49$ ,  $p = <.001$ ) and explained 53.3% of the total variance in intensity of social networking services, indicated by its total  $R^2$ . In addition, multicollinearity did not harm the model ( $VIF = 1.05$  to  $3.88$ , tolerance =  $0.25$  to  $0.95$ ).

In terms of control variables, the age indicator (older than 26 years:  $\beta = -.40$ ,  $p = <.05$ ) significantly affected intensity of social networking services. Thus, respondents older than 26 years old tend to perceive a weaker intensity of social networking services. The Internet usage indicator (more than 400 minutes:  $\beta = .56$ ,  $p = <.001$ , 101 to 250 minutes:  $\beta = .35$ ,  $p = <.001$ , 251 to 400 minutes:  $\beta = .25$ ,  $p = <.05$ ) also significantly affected intensity of social networking services. Thus, respondents who use the Internet more than 100 minutes per day tend to perceive stronger intensity of social networking services. Furthermore, native language indicator (English:  $\beta = .25$ ,  $p = <.05$ ) significantly affected intensity of social networking services; native speakers of English tend to perceive a stronger intensity of social networking services.

Notably, intensity of smartphones ( $\beta = .56$ ,  $p = <.001$ ) significantly affected intensity of social networking services. Thus, approximately a standard deviation score change in intensity of smartphones increased the intensity of social networking services by about 0.56 of a standard deviation score. In addition, the intensity of smartphones demonstrated the largest influence on intensity of social networking services among the included independent variables (Beta = .55). The result indicated that a higher level of intensity of smartphones results in a stronger intensity of social networking services. Therefore, the results supported Hypothesis 1.

Table 4-8. Linear regression analysis for the intensity of social networking services

Independent variables	Intensity of social networking services		
	$\beta$	(SE) <sup>1</sup>	Beta
Constant	-0.23	(0.18)	-
Male	-0.10	(0.05)	-0.06
Age			
20 – 25	0.08	(0.06)	0.05
older than 25	-0.40	(0.17)*	-0.18
Ethnicity			
Black/African American	-0.10	(0.10)	-0.04
Hispanic/Latino	0.07	(0.14)	0.03
Asian/Pacific Islander	0.07	(0.12)	0.04
Internet usage			
101min ~ 250min	0.35	(0.07)***	0.02
251min ~ 400min	0.25	(0.10)*	0.12
more than 400min	0.56	(0.14)***	0.18
Undergraduates	-0.02	(0.04)	-0.06
English	0.25	(0.12)*	-0.14
Domestic	-0.11	(0.14)	-0.05
Monthly allowance			
\$501 – \$1000	-0.02	(0.07)	-0.01
more than \$1000	-0.05	(0.11)	-0.02
Intensity of smartphones	0.56	(0.05)***	0.55
Observations = 339			
F = 23.18***			
R <sup>2</sup> = 0.534			

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001; <sup>1</sup>represents robust standard errors in parentheses.

## The Second Research Question

The second research question asked what role social networking services play (e.g., maintain existing and former networks, extend new networks) as an online communication medium. In order to further examine whether users used the services to maintain existing and former networks or extend new networks, this study developed several items, as shown in Table 4-9.

The former scale was measured by two items to determine whether respondents used social networking services to connect with existing and former contacts, such as family, former colleagues and intimate friends (Cronbach's alpha = .72). The latter scale was also measured by two items to determine whether respondents used social

networking services to connect with new people who share similar interests and information without any association with pre-existing networks (Cronbach's alpha = .82).

Table 4-9 shows that respondents indicated significantly more social networking services use involving maintaining former and existing networks (M = 4.07) than extending new networks (M = 2.91) ( $t = 20.56, p < .000$ ).

Table 4-9. Intent to use social networking services

Individual items and scale	M	S.D.
<b>Use SNSs to connect with Existing and Former Contacts (Cronbach's alpha = 0.72)</b>	<b>4.07</b>	<b>0.71</b>
I use SNSs to communicate with family, former colleagues and intimate friends.	4.21	0.78
I use SNSs to keep up with my former existing network.	3.93	0.83
<b>Use SNSs to connect with New People (Cronbach's alpha = 0.82)</b>	<b>2.91</b>	<b>0.97</b>
I use SNSs to meet new people who share similar interests and information.	2.97	1.06
I use SNSs to get to know people I would otherwise not meet at pre-existing networks.	2.84	1.05

Note: Individual items ranged from 1 = strongly disagree to 5 = strongly agree, scales constructed by taking mean of items.

### The Third Research Question

The third research question asked how intensity of social networking services, such as an online communication medium, influence social capital resources (e.g., trust, political participation, organizational memberships, and network diversity). Four main hypotheses were derived from this research question. To explore the research question, this study conducted multiple linear regression, logistic regression, and Poisson regression analyses.

### The Second Hypothesis

To examine H2 regarding the relationships among intensity of smartphones, intensity of social networking services, and trust, this study conducted two successive multiple linear regression analyses. The robust estimates of the standards error were

calculated for both models as both models were set against both normality and homogeneity of the residual assumptions.

As shown in Table 4-10, the F-test indicated that model 1 (without including intensity of social networking services) was significant ( $F = 17.69$ ,  $p = <.001$ ). The total variance of trust explained by model 1 was 38.9% ( $R^2 = .389$ ). Meanwhile, the F-test indicated that model 2 (including intensity of social networking services) was significant ( $F = 19.22$ ,  $p = <.001$ ). The total variance of trust explained by model 2 was 42.2% ( $R^2 = .422$ ). In addition, multicollinearity is not a significant problem in either model.

In model 1, intensity of smartphones was positively associated with trust ( $\beta = .42$ ,  $p = <.001$ ). The coefficient of intensity of smartphones was reduced after including intensity of social networking services in model 2, although it was still statistically associated with trust. This indicates that intensity of smartphones was directly, indirectly, and positively associated with trust via intensity of social networking services.

In terms of control variables, in model 2, the age indicator (older than 26 years:  $\beta = .36$ ,  $p = <.01$ ) significantly affected trust: Respondents older than 26 years old tended to perceive higher trust. The ethnicity indicator (Hispanic/Latino:  $\beta = -.23$ ,  $p = <.05$ ) also significantly affected trust, as Hispanic/Latino respondents tended to perceive lower trust. Moreover, the Internet usage indicator (more than 401 minutes:  $\beta = -.29$ ,  $p = <.01$ ) significantly affected trust; respondents who use the Internet more than 401 minutes per day tended to perceive lower trust.

Notably, intensity of smartphones ( $\beta = .31$ ,  $p = <.001$ ) and intensity of social networking services ( $\beta = .19$ ,  $p = <.001$ ) significantly affected trust in model 2. In addition, intensity of smartphones had the largest effect on intensity of social networking

services compared to other variables in model 2 (Beta = .41). The results indicate that higher level of intensity of smartphones and intensity of social networking services results in a higher level trust. Thus, these results supported Hypotheses 2a, 2b, and 2c.

Table 4-10. Linear regression analysis for trust

Independent variables	Model 1			Model 2		
	$\beta$	(SE) <sup>1</sup>	Beta	$\beta$	(SE) <sup>1</sup>	Beta
Constant	4.07	(0.16)	–	4.12	(0.15)	–
Male	–0.08	(0.05)	–0.07	–0.06	(0.05)	–0.05
Age						
20 – 25	0.06	(0.06)	0.05	0.05	(0.06)	0.04
older than 25	0.28	(0.13)**	0.18	0.36	(0.12)**	0.23
Ethnicity						
Black/African American	–0.04	(0.07)	–0.02	–0.02	(0.07)	–0.01
Hispanic/Latino	–0.21	(0.11)*	–0.12	–0.23	(0.10)*	–0.13
Asian/Pacific Islander	–0.09	(0.13)	–0.06	–0.11	(0.13)	–0.08
Internet usage						
101min ~ 250min	0.13	(0.07)	0.11	0.06	(0.07)	0.05
251min ~ 400min	–0.07	(0.08)	–0.05	–0.12	(0.09)	–0.08
more than 400min	–0.16	(0.10)	–0.08	–0.29	(0.09)**	–0.13
Undergraduates	0.00	(0.02)	0.00	0.00	(0.03)	0.02
English	–0.07	(0.11)	–0.05	–0.12	(0.10)	–0.09
Domestic	–0.09	(0.10)	–0.06	–0.07	(0.09)	–0.04
Monthly allowance						
\$501 – \$1000	0.03	(0.06)	0.02	0.03	(0.06)	0.03
more than \$1000	–0.00	(0.09)	–0.00	0.00	(0.09)	0.00
Intensity of smartphones	0.42	(0.04)***	0.56	0.31	(0.05)***	0.41
Intensity of SNSs				0.19	(0.05)***	0.26
Observations = 339	F = 17.69***		F = 19.22***			
	R <sup>2</sup> = 0.38		R <sup>2</sup> = 0.42			

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001; <sup>1</sup>represents robust standard error.

### The Third Hypothesis

To test H3 regarding the relationships among intensity of smartphones, intensity of social networking services, and political participation, this study performed Poisson regression analyses since political participation was considered to be an outcome. In particular, this study conducted a generalized Poisson regression (Hilbe, 2011).

As shown in Table 4-11, in model 1, intensity of smartphones (IRR = 1.27,  $p = <.001$ ) significantly affected political participation. A standard deviation score increase in the intensity of smartphones resulted in a 27% increase in the respondent's predicted mean political participation. Meanwhile, in model 2, although the association between intensity of smartphones and political participation was attenuated, it was still statistically significant (IRR = 1.11,  $p = <.05$ ). The results supported Hypotheses 3a and 3c—that is, the intensity of smartphones use is directly, indirectly, and positively associated with political participation via intensity of social networking services.

In terms of control variables, Hispanic/Latino (IRR = 0.73, 95%CI = 0.58 to 0.91) and Asian (IRR = 0.76, 95%CI = 0.61 to 0.95) ethnicities—holding others in the model constant—were less likely to participate in political issues or activities. Respondents who use the Internet 101 to 250 minutes (IRR = 1.20, 95%CI = 1.03 to 1.40) and 251 to 400 minutes (IRR = 1.21, 95%CI = 1.01 to 1.45) per day, compared to respondents who use the Internet less than 101 minutes per day, were more likely to participate in political issues or activities. Moreover, respondents who spend \$501 to \$1,000 per month for their allowance (IRR = 1.13, 95%CI = 1.02 to 1.24), compared to respondents who spend less than \$501 per month for their allowance, were more likely to participate in political issues or activities.

Notably, intensity of social networking services (IRR = 1.23, 95%CI = 1.11 to 1.36) significantly affected political participation. This result indicates that a higher level of intensity of social networking services results in dynamic political participation. In other words, the intensity of social networking services use is positively associated with political participation, which supports Hypothesis 3b.

Table 4-11. Poisson regression analysis for political participation

Independent variables	Model 1		Model 2	
	IRR <sup>2</sup>	95% CI <sup>1</sup>	IRR <sup>2</sup>	95% CI <sup>1</sup>
Male	1.02	0.92 to 1.12	1.03	0.93 to 1.13
Age				
20 – 25	1.05	0.93 to 1.18	1.03	0.91 to 1.16
older than 25	1.12	0.89 to 1.40	1.21	0.98 to 1.51
Ethnicity				
Black/African American	1.08	0.96 to 1.21	1.11	0.99 to 1.24
Hispanic/Latino	0.76*	0.60 to 0.96	0.73**	0.58 to 0.91
Asian/Pacific Islander	0.78*	0.62 to 0.98	0.76*	0.61 to 0.95
Internet usage				
101min ~ 250min	1.28**	1.10 to 1.49	1.20*	1.03 to 1.40
251min ~ 400min	1.24*	1.04 to 1.48	1.21*	1.01 to 1.45
more than 400min	1.31*	1.05 to 1.64	1.17	0.94 to 1.46
Undergraduates	1.00	0.95 to 1.04	1.00	0.96 to 1.05
English	0.89	0.70 to 1.14	0.83	0.65 to 1.05
Domestic	1.22	0.93 to 1.61	1.26	0.97 to 1.64
Monthly allowance				
\$501 – \$1000	1.11	1.00 to 1.23	1.13*	1.02 to 1.24
more than \$1000	1.12	0.93 to 1.35	1.14	0.96 to 1.37
Intensity of smartphones	1.27***	1.15 to 1.39	1.11*	1.01 to 1.23
Intensity of SNSs			1.23***	1.11 to 1.36
Observations = 339	AIC = 1062.132		AIC = 1047.065	
	BIC = 1127.174		BIC = 1115.933	

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001; <sup>1</sup>represents confidence interval; <sup>2</sup>represents incidence rate ratios.

### The Fourth Hypothesis

To test H4 regarding the relationships among intensity of smartphones, intensity of social networking services, and organizational memberships, this study performed multiple logistic regression analyses.

The results are shown in Table 4-12. In model 1, intensity of smartphones significantly affected organizational memberships ( $p = <.001$ ). A standard deviation score increase in the intensity of smartphones increased the odds of membership in any organization by 75% (OR = 1.75, 95%CI = 1.22 to 2.51). Compared to model 1, both AIC and BIC were lower in model 2.

In model 2, intensity of smartphones did not statistically affect organizational memberships at the 5% significance level, which indicates that intensity of smartphones is perfectly mediated by intensity of social networking services (Baron & Kenny, 1986). Thus, this result did not support Hypothesis 4a. Meanwhile, intensity of social networking services significantly affected organizational memberships ( $p = <.01$ ). A standard deviation score increase in the intensity of social networking services increased the likelihood of respondents participating in any organization by 108% (OR = 2.08, 95%CI = 1.30 to 3.33). Such a result indicates that respondents with a high level of intensity of social networking services were more likely to participate in any organization, thereby supporting Hypothesis 4b. In other words, intensity of social networking services use is positively associated with organizational memberships. Indeed, the results also supported Hypothesis 4c: Intensity of smartphones use is indirectly and positively associated with organizational memberships via intensity of social networking services.

In terms of control variables, the grade indicator (undergraduates: OR = 0.75; 95%CI = 0.59 to 0.96) significantly affected organizational memberships. Undergraduate respondents were less likely to report being an active member of any organization. The Internet usage indicator (more than 401 minutes: OR = 0.23; 95%CI = 0.07 to 0.77) significantly affected organizational memberships. Respondents who use the Internet more than 401 minutes per day were less likely to report being an active member of any organization. Finally, the monthly allowance indicator (\$501 to \$1000: OR = 1.91; 95%CI = 1.01 to 3.69) significantly affected organizational memberships;



respondents who spend \$501 to \$1000 per month for their allowance were more likely to report being an active member of any organization.

Table 4-12. Logistic regression analysis for organizational memberships

Independent variables	Model 1		Model 2	
	OR <sup>2</sup>	95% CI <sup>1</sup>	OR <sup>2</sup>	95% CI <sup>1</sup>
Male	0.65	0.39 to 1.08	0.70	0.42 to 1.18
Age				
20 – 25	0.71	0.38 to 1.33	0.65	0.34 to 1.25
older than 25	0.45	0.14 to 1.39	0.59	0.18 to 1.85
Ethnicity				
Black/African American	2.06	0.89 to 4.79	2.37	0.99 to 5.66
Hispanic/Latino	0.45	0.15 to 1.33	0.45	0.15 to 1.30
Asian/Pacific Islander	0.75	0.27 to 2.09	0.70	0.25 to 1.94
Internet usage				
101min ~ 250min	1.66	0.88 to 3.13	1.29	0.66 to 2.51
251min ~ 400min	1.46	0.64 to 3.30	1.20	0.52 to 2.76
more than 400min	0.35	0.11 to 1.12	0.23*	0.07 to 0.77
Undergraduates	0.74*	0.58 to 0.95	0.75*	0.59 to 0.96
English	0.56	0.19 to 1.64	0.47	0.16 to 1.39
Domestic	0.88	0.30 to 2.59	0.93	0.31 to 2.77
Monthly allowance				
\$501 – \$1000	1.88*	1.00 to 3.52	1.91*	1.01 to 3.60
more than \$1000	0.62	0.27 to 1.43	0.65	0.28 to 1.53
Intensity of smartphones	1.75**	1.22 to 2.51	1.18	0.76 to 1.84
Intensity of SNSs			2.08**	1.30 to 3.33
Observations = 339	AIC = 404.095		AIC = 396.5239	
	BIC = 465.311		BIC = 461.5659	

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001; <sup>1</sup>represents confidence interval; <sup>2</sup>represents odds ratio.

### The Fifth Hypothesis

To examine H5 regarding the relationships among intensity of smartphones, intensity of social networking services, and network diversity, this study conducted generalized Poisson regression analyses since network diversity was considered to be an outcome.

As shown in Table 4-13, in model 1, intensity of smartphones significantly affected network diversity (p = <.001). Increasing a standard deviation score in the intensity of smartphones increased the expected number of network diversity by 19%. (IRR = 1.19,

95%CI = 1.12 to 1.26). Furthermore, in model 2, intensity of social networking services significantly affected network diversity ( $p < .05$ ). For every standard deviation score increase in the intensity of social networking services, a respondent's predicted mean network diversity increased by 7% (IRR = 1.07, 95%CI = 1.01 to 1.14). The results indicate that respondents who have a high level of intensity of social networking services tend to keep in touch with diverse people, supporting Hypothesis 5b. In other words, intensity of social networking services use is positively associated with network diversity.

Table 4-13. Poisson regression analysis for network diversity

Independent variables	Model 1		Model 2	
	IRR <sup>2</sup>	95% CI <sup>1</sup>	IRR <sup>2</sup>	95% CI <sup>1</sup>
Male	0.97	0.91 to 1.03	0.98	0.92 to 1.04
Age				
20 – 25	1.08*	1.00 to 1.17	1.08	1.00 to 1.17
older than 25	1.10	0.95 to 1.27	1.15	1.00 to 1.33
Ethnicity				
Black/African American	1.01	0.92 to 1.10	1.02	0.93 to 1.11
Hispanic/Latino	1.14	1.00 to 1.30	1.13	0.99 to 1.29
Asian/Pacific Islander	1.07	0.92 to 1.24	1.05	0.91 to 1.22
Internet usage				
101min ~ 250min	1.16**	1.06 to 1.28	1.13*	1.02 to 1.24
251min ~ 400min	1.11	0.99 to 1.25	1.10	0.98 to 1.23
more than 400min	1.15	0.99 to 1.33	1.10	0.95 to 1.28
Undergraduates	1.02	0.99 to 1.05	1.02	0.99 to 1.05
English	1.17*	1.01 to 1.36	1.14	0.99 to 1.32
Domestic	0.92	0.79 to 1.08	0.93	0.80 to 1.07
Monthly allowance				
\$501 – \$1000	1.01	0.95 to 1.09	1.02	0.95 to 1.09
more than \$1000	0.97	0.87 to 1.08	0.97	0.87 to 1.08
Intensity of smartphones	1.19***	1.12 to 1.26	1.14***	1.07 to 1.22
Intensity of SNSs			1.07*	1.01 to 1.14
Observations = 339	AIC = 1128.703		AIC = 1125.576	
	BIC = 1193.745		BIC = 1194.444	

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ; <sup>1</sup>represents confidence interval; <sup>2</sup>represents incidence rate ratios.

In addition, the intensity of smartphones was statistically significant (IRR = 1.14, 95%CI = 1.07 to 1.22,  $p < .001$ ), supporting Hypotheses 5a and 5c. These results

indicate that respondents who have a high level of intensity of smartphones tend to keep in touch with diverse people. That is, intensity of smartphones use is directly and indirectly associated with network diversity via intensity of social networking services.

In terms of control variables, respondents who use the Internet 101 to 250 minutes per day (IRR = 1.13, 95%CI = 1.02 to 1.23,  $p = <.05$ ), compared to respondents who use internet less than 101 minutes per day, were more likely to have diverse networks.

## CHAPTER 5 DISCUSSION

This study sought to explore the pattern and usage of smartphones and social networking services as well as propose practical implications to users to create a better understanding of the linkage between social media and social capital. In particular, the study emphasizes the role of diverse social capital for a better democratic society. More specifically, this study examined the relationships among the intensity of smartphones, intensity of social networking services, and social capital indicators, including trust, political participation, organizational membership, and network diversity.

The findings of the research questions reported that the purpose of intent to use smartphones was divided into three main categories: communication, entertainment, and information. Of the three purposes, respondents significantly more often used smartphones to communicate with others than for entertainment or information purposes, although all three purposes were positively linked to intent to use smartphones. Furthermore, in terms of social networking services, respondents overwhelmingly used smartphones to keep in touch with their intimate friends, family members, as well as colleagues and maintain their pre-existing networks.

This study also sought to examine whether intensity of smartphones and intensity of social networking services influence social capital indicators. According to the multiple linear, multiple logistic, and Poisson regression analyses, intensity of smartphones and intensity of social networking services significantly affected the indicators of social capital after controlling for demographics, economics items, and Internet usage. In particular, intensity of smartphones was directly and positively associated with trust, political participation, and network diversity. In addition, intensity

of smartphones was also indirectly and positively associated with organizational memberships. Meanwhile, intensity of social networking services was positively related to trust, political participation, organizational memberships, and network diversity.

### **Smartphones and Social Networking Services**

The first research question examined the purposes of intent to use smartphones (e.g., social network, entertainment, and information), as a mobile communication device (RQ1). As paired-samples t-tests reported, respondents used smartphones significantly more often to communicate with people ( $M = 4.68$ ) than for entertainment ( $M = 3.94$ ) or information gathering ( $M = 3.88$ ).

In other words, for many respondents, smartphones mainly provided diverse ways to communicate with people by calling, sending text messages, and using mobile social networking services, such as Facebook and Twitter. In particular, convenient mobile applications provided an alternative way to log in to social networking services. This was demonstrated according to whether people preferred to use social networking services via smartphones or via computers, which was likely to be relevant for communicational purposes. Respondents indicated that they preferred using social networking services via computers (66%) to smartphones (34%). This result differs from the patterns investigated by early researchers exploring mobile communication and smartphones, although respondents preferred to use social networking services via computers rather than via smartphones.

Before the emergence of smartphones, people had to access social networking services via a desktop or laptop, which created spatial and temporal constraints. However, with the advent of smartphones—and due to the convenient interface of mobile social networking services' applications—smartphones users can connect to

social networking services without spatial and temporal constraints. In other words, mobile social networking services can serve as user-friendly communication tools and may be more facilitated by the diffusing of smartphones.

The second research question addressed what role social networking services play (e.g., to maintain existing and former networks and extend new networks) as an online communication medium (RQ2). As paired-samples t-tests reported, respondents overwhelmingly used more social networking services to maintain or reinforce former relationships and keep in touch with their intimate friends, family, and colleagues ( $M = 4.07$ ) than to extend new networks and meet new people ( $M = 2.91$ ).

As repeatedly noted, social networking services offered various sorts of ways to communicate with intimate friends and new people. Although this study demonstrates that respondents are more likely to use social networking services with their current friends than with new people, some scholars have suggested that the role of social networking services can be influenced by each service's particular features. Java et al. (2007) demonstrated that Twitter users tend to keep in touch with new people as this service's universally asymmetrical system enables users to meet new friends who connect in a reciprocated or one-way manner. Meanwhile, Facebook users are likely to focus on common existing components in trying to maintain offline friendships (Ellison et al., 2007). Thus, each service's unique feature significantly impact the role of social networking services.

This study further addressed whether the intensity of smartphones could empirically facilitate the intensity of social networking services. Based on a review of literature related to smartphones and social networking services (Counts & Fisher,

2010; Schmidt et al., 2008; Yee & Hargis, 2009), the current study hypothesized that intensity of smartphones should positively play a critical role in the intensity of social networking services. In fact, few studies have examined the relationship between smartphones and social networking services as the momentous popularity and diffusions of such media only appeared recently, in the middle 2000s. Despite such an issue, some scholars have attempted to explore whether smartphones offer a robust factor that allows users to engage in social networking services.

Hampton, Goulet, Rainie, and Purcell (2011) found that 76% of social networking service users access sites on their smartphones. In addition, many people use their smartphones for social networking services in place of personal computers (Hampton et al., 2011). Accordingly, high levels of intensity of smartphones could positively affect the intensity of social networking services, because without smartphones, social networking services users cannot access sites due to spatial and temporal constraints. By conducting multiple linear regression analyses, this study confirmed the empirical evidence of the conceptual association between intensive usage of smartphones and intensive usage of social networking services.

### **Social Capital Indicators and Social Media**

Although many studies have examined how social networking services affect social capital, few studies have been conducted to explore how smartphones affect social capital. In addition, less attention has been focused on the linkage among smartphones, social networking services and social capital. This study asserted that the intensity of smartphones and social networking services can promote the accumulation of social capital. By exploring this, social media can contribute to a better democratic society and increase social capital.

Notably, communication researchers and sociologists should be able to perceive which social media factors intensify social capital. This study proposed that the intensity of smartphones and social networking services would directly, indirectly, and positively affect four indicators of social capital considered to be the main concepts of social capital by many scholars (Coleman, 1988; Lin, 2001; Putnam, 2000). Multiple linear, logistic, and Poisson regression results suggested that the intensity of smartphones and social networking services is apt to have significant impacts on all four social capital indicators—namely, trust, political participation, organizational memberships, and network diversity—although the intensity of smartphones is indirectly associated with organizational memberships through the intensity of social networking services. These findings indicate that the intensity of social networking services is more influential than the intensity of smartphones on organizational memberships, which enables individuals to broaden their social activities and networks.

As noted in the previous section, the association between the intensity of smartphones and social networking services implies that high levels of intensity of such social media will play a vital role in accumulating individuals' social capital. Without the presence of convenient and useful social media, including smartphones and social networking services, individuals feel inconvenient and difficulty when social networking with others.

As this study predicted, intensity of smartphones and intensity of social networking services is directly and positively related to trust at the  $p$ -value .001 significance level or more. In addition, intensity of smartphones through the intensity of social networking services is also indirectly and positively related to trust at the  $p$ -value .001 significance



level or more. As such, the intensity of social media (i.e., smartphones and social networking services) increases trust among individuals. Trust consists of four questions that are intangible (e.g., honesty, faiths, and reliability) forms of social capital. A low level of trust prevents collaboration or harmonious discussion that leads to social mistrust. The findings demonstrate that smartphones and social networking services can facilitate individuals' communications with others to amass trust. Accordingly, this study identified a significant impact on trust.

This study also considered political participation as a core of social capital that supports a democratic society. The generalized Poisson regression analyses showed manifest evidence that smartphones and social networking services significantly influence political participation. Intensity of smartphones is directly and positively related to political participation at the  $p$ -value .001 significance level or more. Intensity of social networking services is also positively related to political participation at the  $p$ -value .001 significance level or more. In addition, the intensity of smartphones through the intensity of social networking services is indirectly and positively related to political participation at the  $p$ -value .05 significance level or more. The results of the current study suggested that individuals with a high level of intensity of smartphones and social networking services tend to participate in political activities and issues that promote a sturdy infrastructure for grassroots democracy. By using social media, individuals can share more political knowledge, information, and understanding and participate in political activities, such as boycotts and demonstrations. Chadwick and Stanyer, (2010) found that users of social media, especially Twitter, actively participate in online discussions while candidates also utilized social media as a communal place in which to connect

with voters. A higher level of political participation is a core value of greater stocks of social capital for stable democracy (Klesner, 2002). Therefore, this study considered social media to be the catalyst to stimulate political participation.

Interestingly, the intensity of smartphones is not directly related to organizational memberships at the  $p$ -value .05 significance level or more, although the intensity of smartphones through the intensity of social networking services is indirectly and positively related to organizational memberships at the  $p$ -value .01 significance level or more. Intensity of social networking services is positively related to organizational memberships at the  $p$ -value .01 significance level or more, indicating that the higher intensity social networking services users have, the more actively they tend to engage in many sorts of organizations. Such results may reflect that smartphones users who are highly involved in social networking services are more likely to participate in a number of organizational memberships and engage in diverse civic participation than those who are not. In other words, the former individuals would realize that their high intensity of social networking services sustains their social activities and networks through diverse memberships in organizations and, consequently, tend to perceive the significant insights of the organizational memberships.

Finally, Poisson regression analyses found that social media's impact on network diversity among individuals who use smartphones and social networking services was significant. According to the results, the intensity of smartphones is directly and positively related to network diversity at the  $p$ -value .001 significance level or more. The intensity of social networking services is also positively related to network diversity at the  $p$ -value .05 significance level or more. In addition, the intensity of smartphones

through the intensity of social networking services is indirectly and positively related to network diversity at the  $p$ -value .001 significance level or more. The findings noted that an individual engaging in intensive social media use (i.e., smartphones and social networking services) is more likely to have diverse networks. Through their high intensity, individuals can keep in touch with diverse others, broaden their social connections, and reach their goal more effectively. Network diversity at the individual level involves the exhibition of connections to gain collective profits and social benefits (Lin, 1999). The current study considered smartphones and social networking services as an “accelerant” that can facilitate the broadening of network diversity.

### **Implications for Smartphones, Social Networking Services, and Social Capital**

The results of this study have implications for better understanding the linkage among smartphones, social networking services, and social capital indicators. This study adopted a broad overall approach to examining the relationship among these factors. Although mobile communication scholars have attempted to emphasize smartphones (i.e., functional perspective), they have not conducted much research about the relationship between smartphones and social capital. As such, more empirical research is needed to investigate such a relationship. For this reason, such a relationship should be further explored to perceive certain theoretical and empirical frameworks for further studies.

For smartphones, measuring the purposes of intent to use is required to estimate the intensive use of smartphones. By examining this, scholars can monitor issues regarding whether users utilize smartphones for communication, entertainment, or information. This may offer benefits for the conceptualization of purpose of smartphones use. As depicted in Table 4-7, smartphones users are more likely to use smartphones

for communication than entertainment or information. This implies that smartphones users continue to perceive communication as their main purpose of use, despite smartphones' number of diverse functionalities. This may help communication scholars take on more proactive actions before measuring the intensity of smartphones.

From the empirical perspective, social networking services have a critical value for social capital in that their unique features provide multiple ways to amass social capital. As reviewed herein, social networking services help strengthen the cohesiveness of connections among individuals. In a well-constructed social networking service, its users keep in touch with their former friends as well as communicate with new people, implying that social networking services users can amass higher trust among individuals intimately connected with friends and family as well as broaden their network diversity by keeping in touch with new people. In addition, greater political participation and commitment to organizations can be expected. In this study, the pivotal features of social networking services included connecting with existing and former contacts and connecting with new people. By adapting smartphones and social networking services to social capital, this study provides discerning implications for communication scholars and sociologists, especially social media research, because social media is one of the most vital facilitators of social capital.

This study identified four indicators of social capital: trust, political participation, organizational memberships, and network diversity. By exploring the sequential relationship among smartphones, social networking services, and social capital, this study found that social media can definitely promote the accumulation of social capital. Social media's ubiquitous functionalities may increase diverse social capital resources.

The empirical evidence of this study indicates the positive contribution of the intensity of smartphones and social networking services to amass trust. In general, trust allows individuals to reach their goals and promote cooperation with others and may also help individuals reinforce and maintain former intimate connections. By providing evidence of positive, direct, and indirect pathways from the intensity of smartphones to the intensity of social networking services and to the trust of social capital, this study demonstrates the positive contribution of intensity of smartphones and social networking services in involving users in higher levels of trust.

Political participation is also associated with the intensity of social media. A lack of communication among individuals may lead to decreasing political interest and participation. As such, social media can be a critical factor of political communication among individuals. If individuals are not interested in political issues and disregard its social importance, it will possibly hinder social communication and harmony while increasing social protests, demonstrations, conflicts, and polarization. Consequently, political participation is essential for an enhanced democratic society. This finding implies that highly intensive usage of social media will be more likely to increase political participation and possibly improve social integration for democracy.

Amazingly, organizational memberships were not directly affected by intensity of smartphones, implying that smartphones cannot directly help promote dynamic civic participation, although the features of social networking services enable users to actively participate in organizations and communities. As such, smartphones use is mediated by social networking services use as to the organizational memberships. Despite their indirect relationship, these positive associations may be useful factors of

social capital. Furthermore, organizational memberships may offset feelings of isolation from others and the anxiety induced by the loneliness.

In addition, this study suggests that the intensity of smartphones and social networking services also helps broaden diverse networks. This evidence indicates that social media (i.e., smartphones and social networking services) positively affect individuals' diversity to maintain and extend interactions, although some previous scholars have examined about the negative aspects of Internet use and online relationships (Nie, 2001). The positive, direct, and indirect relationship among smartphones, social networking services, and network diversity refutes the negative perspective of the social media that prevents deeper and more diverse relationships among individuals. As such, the intensive use of smartphones and social networking services plays a significant role in network diversity.

This study also offers implications for communication and sociology fields. Scholars in social media have attempted to examine how social capital as a catalyst for grassroots democracy is accumulated by social media use and access, such as Facebook and Twitter. In particular, the association between usage and patterns of social media and the amassing of social capital is pivotal to perceiving precursors to better society. Many empirical studies have suggested that social media use affects social capital, such as bonding and bridging.

Furthermore, as in the current study, the concept of social capital may be applied to other communication and sociology issues. Wall (2007) previously argued that online social capital should be differentiated from offline social capital. Kwon and Nam (2009) asserted that, although social capital collected by online activities is not directly

associated with offline social capital and action, social capital collected by offline action is mediated by online social capital. In other words, online social capital can serve as an effective medium for promoting offline civic engagements and can serve as a significant step for sharing information, coordinating with others, and facilitating civic participation that leads to the collecting of offline social capital. As such, social capital could not be categorized into offline and online or bridging or bonding. By adopting such a concept, individuals who use or have smartphones and social networking services will be more likely to accumulate their social capital.

### **Limitations and Future Research**

This study revealed theoretical and practical implications of relationships among smartphones, social networking services, and social capital. However, this study also has several limitations, including a sampling issue in that the study gathered data samples only from college students who substantially use smartphones and social networking services. Thus, these findings cannot be generalized to other sorts of contexts, such as organizations or communities. To overcome this limitation, future research should examine smartphones use and social networking services use in other contexts and also incorporate a statewide or nationwide survey using random sampling, longitudinal data over a series of years, and a panel sample.

Likewise, when it comes to social capital, no consensus has emerged about the concept and measure due to the broad definition. Thus, many studies on social capital have often reported inconsistent and inconclusive results that may derive from poor and different conceptualization and measurement of the social capital (Kawachi, Kim, Coutts, & Subramanian, 2004). Although this study adopted a multidimensional concept (e.g., structural and cognitive) to overcome such limitations, some concepts might be

criticized for measuring indicators of social capital with similar items among them. Therefore, future research should precisely define the concept and measurement of social capital as well as utilize accurate scales.

Furthermore, the survey questionnaire in the current study included diverse dimensions of social capital indicators, such as trust, political participation, and network diversity. For example, network diversity indicator using the resource generator was originally constructed by 27 lengthy questions. Thus, some respondents responded quite insincerely. This problem can result in different response patterns between sincere respondents and insincere respondents.

This study also found that some variables' reliability was relatively low. The Cronbach's alpha score of trust was .67, which is less than .70. This may have occurred due to the several reverse questions. In general, respondents were more likely to answer "agree" than "disagree." However, some respondents may have misunderstood several reversed questions as this study used normal others. Future research should consider reverse questions through sufficient pilot testing.

Finally, this study did not categorize smartphones into specific brands (e.g., iPhone<sup>®</sup>, Blackberry<sup>®</sup>, Droid<sup>™</sup>). Each smartphones has its own unique system and features; thus, differentiating among them may be useful in future research. In addition, each social networking service also has its own unique interface and functionalities. Thus, usage patterns of social networking services may be influenced by each social networking service's diverse characteristics. For instance, this study presented that Facebook users preferred to use social networking services via desktop and laptop computers, whereas Twitter users preferred to use social networking services via



smartphones. Therefore, a comparative study among each social networking service should be conducted in the future.

### **Conclusion**

Empirical results of this study differ from the anecdotal evidence pertaining to the universal communication fields. Although many diverse studies in social media have emphasizes the connection between social networking services and online social capital (Boyd & Ellison, 2007; Ellison et al., 2007; Steinfield et al., 2009), they have focused less on the comprehensive measure of social networking services and social capital, including both online and offline in terms of various dimensions of social capital. Furthermore, few empirical studies have examined the relationship between smartphones and social networking services or the association between smartphones and social capital because of the short history of smartphones.

This study tried to explore the intent to use smartphones and social networking services for the estimation of usage patterns of social media. In a fundamental process, the study also attempted to find empirical evidence to demonstrate a pivotal relationship among smartphones usage, social networking services usage, and indicators of social capital, especially in regard to trust, political participation, organizational memberships, and network diversity.

The empirical findings demonstrate that the intensity of both smartphones and social networking services result in amassing social capital. Three indicators of social capital—trust, political participation, and network diversity—are directly, indirectly and positively connected with intensive use of smartphones and social networking services, except for organizational memberships which are indirectly and positively connected

with the intensive use of smartphones through the intensity of social networking services.

APPENDIX A  
INFORMED CONSENT

**Informed Consent U-1053-2010**  
**Protocol Title:** A study on social media and social capital.

**Please read this consent document carefully before you decide to participate in this study.**

**Purpose of the research study:**

The purpose of this study is to explore the relations among smartphones, social networking services, and social capital.

**What you will be asked to do in the study:**

Fill in a questionnaire survey containing less than 30 questions.

**Time required:**

The author estimate that this study will take approximately from five to ten minutes to complete.

**Risks and Benefits:**

No risks. There are no direct benefits to you for participating in the study.

**Compensation:**

There is no compensation to you for participating in the study.

**Confidentiality:**

You will be anonymous; no email or IP addresses or other identifying information will be connected to your responses at any time. No links will be made that would allow the researchers to identify you. When the study is completed and the data have been analyzed, the information will be destroyed.

**Voluntary participation:**

Your participation in this study is completely voluntary. There is no penalty for not participating. You may choose to leave the survey at any time. You can connect to survey via Qualtrics and will IP addresses be maintained.

**Whom to contact if you have questions about the study:**

Kyung-Gook Park, Master's Student, College of Journalism and Communication

Dr. Lynda Lee Kaid, College of Journalism and Communication

**Whom to contact about your rights as a research participant in the study:**

For information regarding your rights as a research participant contact the IRB at 352-392-0433.

**Agreement:**

I have read the procedure described above. I voluntarily agree to participate in the procedure. Check Box here: \_\_\_\_\_.

APPENDIX B  
SURVEY QUESTIONNAIRE

- This is a confidential survey about relationships among smartphones, social networking services, and social capital. Your response will help me make my thesis more valuable and effective.
- There are no correct or wrong answers –this is NOT a test.
- Please answer honestly.
- If a question makes you feel uncomfortable, you don't have to answer it.
- If you don't understand a question, please ask me for more information.
- If you do not find an answer that fits exactly, use the one that comes closest.

**Smartphones (iPhone, BlackBerry, Galaxy, Cosmos, Droid, and etc.)**

1. In terms of intensity of smartphones use, how much do you agree with each of the following statements? (If you do not have or use smartphones, please circle one at strongly disagree)

	Question	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
1	My smartphone is part of my everyday activity					
2	I am proud to tell people I am a smartphone user					
3	My smartphone has become part of my daily routine					
4	I feel I am part of the smartphone users' community					
5	I would be disappointed if I cannot use my smartphone for a week because of loss.					

2. In terms of intent to use smartphones, how much do you agree with each of the following statements? (If you do not have or use smartphones, please circle one at strongly disagree)

	Question	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
1	I use smartphones to communicate with people (e.g., give a call, send text					

	message, email, and using online social networking services).					
2	I use smartphones for entertainment purposes (e.g., game, music, sports, video, and photography).					
3	I use smartphones for informational purposes (e.g., education, e-book, weather, news, navigation and the Internet).					

3. If you have or use smartphones, on average, about how many minutes per day have you spent on smartphones? (If not, please skip this question)  
 (            ) minutes

### **Social Networking Services (Facebook, Twitter, MySpace, and etc.)**

1. In terms of intensity of Social networking services (SNSs) use, how much do you agree with each of the following statements?

	Question	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
1	SNSs are part of my everyday activity					
2	I am proud to tell people I use SNSs					
3	SNSs have become part of my daily routine					
4	I feel I am part of the SNSs community					
5	I would be sorry if SNSs shut down					

2. In terms of intent to use SNSs, how much do you agree with each of the following statements?

	Question	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
1	I use SNSs to communicate with family, former colleagues and intimate friends					
2	I use SNSs to keep up with my former existing network					

3	I use SNSs to meet new people who share similar interests and information					
4	I use SNSs to get to know people I would otherwise not meet at pre-existing networks					

3. If you use or have accounts of SNSs, on average, about how many minutes per day have you spent on SNSs? (If not, please skip this question)  
(            ) minutes

4. If you use or have accounts of SNSs, do you prefer to use SNSs via smartphones or to use SNSs via computers? Please circle one  
(1) Smartphones

(2) Computers

5. If you use or have accounts of SNSs, which do you use SNS the most? (            )

6. If you use or have accounts of SNSs, please indicate your number of SNSs connections (i.e. Friends / Followings) (If not, please skip this question)  
(            )

## Social Capital

1. For each one, could you indicate whether you know personal friend who is at least one person in any relationship or no person at all in your own networks?

	Do you know personal friend who...	At least one person, in any relationship	No person at all
1	Reads a professional journal?		
2	Earns more than \$4,000 monthly?		
3	Owens a holiday home abroad?		
4	Knows a lot about governmental regulations?		
5	Can give advice on matters of law?		

2. For each one, could you indicate whether you are an active member, an inactive member, or not a member of that type of membership in organization?

	Form of Participation	An active member	An inactive member	Not a member
1	Community project			

2	Committee some local organization			
3	Public meeting on town affairs			
4	Literary, artistic, or discussion group			
5	Political party or meeting			
6	Fraternity or Sorority			
7	Environmental organization			
8	Better government group			

3. For each one, could you indicate the following statements?

	Question	YES	NO
1	Have you ever participated in political demonstrations, boycotts, or marches before?		
2	Have you watched any political debates on TV?		
3	Have you aligned yourself with any political party?		
4	Have you ever attended at political meeting or rally before?		

4. Generally speaking, how much do you agree with each of the following statements?

	Question	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
1	There is someone I can turn to for advice about making very important decisions					
2	There are no several people I trust to solve my problems					
3	Most of the time people try to be helpful					
4	Most people cannot be trusted					

## Demographics



1. How old are you? (            )
2. What is your gender? Please circle one
  - (1) Male
  - (2) Female
3. What is your race? Please circle ALL that apply
  - (1) White or Caucasian
  - (2) Black or African American
  - (3) Hispanic or Latino
  - (4) Asian
  - (5) Native Hawaiian or Pacific Islander
  - (6) Native American or Alaska Native
4. What grade are you in? Please circle one
  - (1) Freshman
  - (2) Sophomore
  - (3) Junior
  - (4) Senior
  - (5) Graduate Student
5. What is your native language? (            )
6. What is your status? Please circle one
  - (1) Domestic Student
  - (2) International Student
7. How much is your total allowance from all sources per month? (\$            )
8. How many minutes do you use the Internet per day? (            ) minutes
9. Do you use smartphone? Please circle one

(1) Yes

(2) No

10. Do you use social networking services? Please circle one

(1) Yes

(2) No

**Thank you.**

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## BIOGRAPHICAL SKETCH

Kyung-Gook Park was born in Seoul, South Korea, in November 1983. While attending university, he developed a robust interest in both information sociology and telecommunication under the outstanding teaching and guidance of Dr. Moon-Gi Suh, who inspired Park to study abroad in the United States. Completing his undergraduate studies in 2009, Park joined the graduate school of journalism and communications as a graduate student specializing in telecommunications at the University of Florida.

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