Loneliness, friendship, and self-esteem: first-year college students' experience of using Facebook

Lai Lei Lou

Univeristy at Albany, State University of New York, siulou@yahoo.com

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LONELINESS, FRIENDSHIP, AND SELF-ESTEEM: FIRST-YEAR COLLEGE STUDENTS’ EXPERIENCE OF USING FACEBOOK

by

Lai Lei Lou

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STUDENTS’ EXPERIENCE OF USING FACEBOOK

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ABSTRACT

With the rapid growth of social network sites, many college students are using the sites to communicate with their friends and families. However, little research has contributed to understanding college students’ communication activities on the social network sites and how these activities affect their psychological well-being. This research project was intended to examine how first-year college students’ use of Facebook was associated with their psychological well-being. Specifically, the study focused on three research questions: (1) Were there any impacts of loneliness on Facebook intensity and motive for using Facebook? (2) Were there any impacts of Facebook intensity and motive for using Facebook on loneliness? (3) Could Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem through the mediation of offline friendship?

Data were collected from a sample of 340 first-year college students from one university and one community college in the Southern U.S. via the College Students Facebook Use Questionnaire. Data were analyzed through structural equation modeling to answer the three research questions.

There were two major findings of the study: First, Facebook intensity could reduce students’ perceived level of loneliness whereas motive for using Facebook had little association with loneliness. Second, Facebook intensity and motive for using Facebook had positive relationship with offline friendship, but offline friendship did not have any association with psychosocial self-esteem.

The results of this study provide both a theoretical understanding of psychological consequence of social networking use and inform better decision
making and implementation of educational practice and educational policy on college students’ social networking use.
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CHAPTER 1: INTRODUCTION

In this chapter a brief overview of Facebook, a popular social network site, is first provided. Then three questions about this dissertation research are addressed: What did I intend to examine in my study? Why did I conduct the study? How did I conduct the study? In addition, several key terms used in the dissertation are defined.

What is Facebook?

Social network sites were normally referred to as web-based services that allowed individuals to (a) construct a public or semi-public profile within a bounded system, (b) connect with other users, and (c) view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2007). Facebook was the fastest growing social network site among all, jumping 270% to have 52.2 millions visitors from June 2006 to June 2007 (comScore, 2007). As a social network site, Facebook had a staggering growth in the fall of 2007. Over 1 million new users signed up every week, 200,000 daily, totaling over 50 million active users. Facebook received 40 billion page views per month. Facebook was the 6th most trafficked site in the US and top photo sharing site with 4.1 billion photos uploaded (Arrington, 2007).

What made social network sites unique was not that they allowed individuals to meet strangers; rather, they enabled users to articulate and make visible their social networks (Boyd & Ellison, 2007). Mark Zuckerberg, the founder of Facebook, believed that this was what made Facebook so compelling: more and more friends joined Facebook, and they could communicate with each other via Internet and expanded connections within Facebook (Levy, 2007). People befriended their offline
friends on Facebook. The center of the page was a News Feed where the stories largely consisted of the activities, brief status reports, photo and video postings, and comments from those one had marked as friends (For detailed information about Facebook, see Appendix A).

**What did I intend to examine in my study?**

My study was intended to answer three research questions. First, were there any impacts of loneliness on Facebook intensity and motive for using Facebook? Second, were there any impacts of Facebook intensity and motive for using Facebook on loneliness? Facebook intensity has been defined as the number of Facebook "friends" and the amount of time spent on Facebook on a typical day, the extent to which the participants were actively engaged in Facebook activities, and their attitudes towards Facebook. Motive for using Facebook has been referred to the intention of using Facebook to communicate with friends. Previous research has indicated that people with loneliness tended to use online communication rather than face-to-face communication (McKenna & Bargh, 1999, 2000). Moreover, people with loneliness could disclose their true and inner self to those on the Internet rather than to those involving face-to-face communication. They tended to form close online relationship and brought virtual relationships into their real lives (McKenna, Green, & Gleason, 2002). As a new type of online communication tool, social network sites have become tremendously popular in the recent years. However, very few researchers have correlated the use of social network sites with loneliness. Consequently, the first and second objectives of my study were to estimate whether
loneliness leads college students to use social network sites, exemplified by Facebook, for communicating with other people online.

Third, could Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem through the mediation of offline friendship? Psychosocial self-esteem has been defined as the positivity of the person’s evaluation of self. Offline friendship has meant time spent with friends in one’s offline environment. Previous research has also indicated that online communications had been associated with psychological well-being (Gross, 2004; McKenna & Bargh, 1999, 2000). People using the Internet and other online communication tools could enlarge their social support systems online and improve their interpersonal relationships offline, thus enhancing their psychological well-being. It would be appealing to examine whether the motive for using Facebook and Facebook intensity affect individual psychosocial self-esteem through the mediation of offline friendship.

**Why did I conduct the study?**

I conducted an empirical study of Facebook use and psychological well-being among college students for two major reasons: (a) to examine the relationship between Facebook use and loneliness, and (b) to investigate the association among Facebook use, offline friendship and psychosocial self-esteem.

**Examine the relationship between Facebook use and loneliness.** With the wide use of Internet, more researchers have tried to understand the association between loneliness and Internet use (e.g., Kraut, Patterson, Kiesler, Mukhopadhyay, & Scherlis, 1998; McKenna & Bargh, 1999, 2000). Some of these researchers studied the impact of Internet use on loneliness while others addressed the lonely
people’s preference on the use of the Internet. The relationship between loneliness and Internet use has been contradictory among these studies.

Among those researchers who studied the impact of Internet use on loneliness, some found that Internet use led to loneliness and depression for individual users (Kraut et al., 1998; Nie, 2001), whereas others claimed that the Internet enhanced intimacy and family ties, thus decreasing loneliness and depression (Katz & Aspden, 1997; Robinson, Kestnbaum, Neustadtl, & Alvarez, 2000). Additionally, some researchers found no association between Internet use and loneliness (Gross, Juvonen, & Gable, 2002; Sanders, Field, Diego, & Kaplan, 2000).

Another group of researchers studied lonely people’s preference for Internet use. McKenna and her colleagues (2000, 2002) found that lonely people were more likely to use online chatrooms and newsgroups to form close relationships with those with whom they met online. These researchers claimed that lonely people eventually brought online friendship into their real life.

With the popularity of social network sites, it was appealing to examine the relationship between loneliness and Internet use by this new form of online communication tool. College students are prone to loneliness (Nicpon et al., 2006). They use different online communication tools, especially Facebook, to communicate with their family, high school friends, and other social groups (Holtgren, 2007).

Investigate association among Facebook use, offline friendship and psychosocial self-esteem. Internet use could bring positive or negative outcomes for young people’s well-being, depending upon how they used the Internet (Rubin, 2002). Facebook was used by most of the college students as an online communication tool
to maintain offline friendship (Holtgren, 2007). It was expected that best friends spent more time with one another than other persons, offering one another emotional support (Klinger, 1977). Additionally, friendship had a momentous impact on youth’s psychosocial self-esteem (Hartup & Stevens, 1997).

McKenna and her colleagues’ research (1999, 2000) used samples collected from newsgroups and chatrooms, where people mainly met and talked with strangers, to build up the association between friendship formation and Internet use. It was not clear how online communication with acquaintances maintained and enhanced friendship and increased psychosocial self-esteem. Thus, Facebook was an ideal place to investigate the above stated relationship because people were likely to communicate with their friends and maintain friendship in Facebook.

**How did I plan to conduct the study?**

The College Students Facebook Use Questionnaire was used to collect data from the first-year college students in one university and one community college in Houston, Texas. This questionnaire consisted of six sections: (1) Demographic Information, (2) Loneliness, (3) Facebook Intensity, (4) Motive for using Facebook, (5) Offline Friendship, and (6) Psychosocial Self-Esteem. Among them, I developed Sections 1, 3, 4 and 5 while I adapted existing scales in the remaining sections. During the Fall semester 2008, I went to 18 classes to introduce myself and the nature of my study (see Appendix C for the detail of my recruitment script). Students in these 18 classes filled out the questionnaire and returned to me in the classes.

The data collected from the surveyed students were analyzed using structural equation modeling to address the three research questions. Specifically, three models
were used to address the three research questions. The first and second hypothesized models were to explain the college students’ loneliness, Facebook intensity and their motive for using Facebook and hence were used to answer the first and second research questions. The third hypothesized model was to describe how Facebook intensity and their motive for using Facebook associated with their offline friendship, both with strong and weak ties, then to relate to their psychosocial self-esteem and was used to answer the third research question. The models were first assessed to determine how well they fit the data collected and then were analyzed to answer the three research questions.

**Operational definition of the terms**

**Loneliness.** Loneliness is operationally defined as initial social relationships less than desired or achieved (Russell, 1996). Loneliness includes subjectivity, uneasy feelings and distress, and perceptions of deficiencies in one’s social relations. A broad definition of loneliness involves a sense of deprivation in one’s social relations. It was an independent variable to predict whether it could enhance one’s motive for using Facebook and Facebook intensity in the first direction of research question 1, and a dependent variable to be predicted from motive for using Facebook and Facebook intensity in the reverse direction of research question 2.

**Motive for using Facebook.** Motive for using Facebook is operationally defined as the intention of using Facebook to communicate with friends, both with strong and weak ties. Strong ties are relationships associated with frequent contact, and deep feelings of affection and obligation, like one’s family and close friends (Kraut et al., 1998). Weak ties are relationships with superficial and easily broken
bonds, and infrequent contact, such as someone in the same class. Motive for using Facebook served as a dependent variable in the first direction of research question 1 and an independent variable in the reverse direction for research question 2 and research question 3.

**Facebook intensity.** Facebook intensity is operationally defined as the number of Facebook "friends" and the amount of time spent on Facebook on a typical day, the extent to which the participants were actively engaged in Facebook activities, and their attitudes towards Facebook (Ellison et al., 2007). It served as a dependent variable in the first direction of research question 1 and an independent variable in the reverse direction of research question 2 and third research question.

**Offline friendship.** Offline friendship is operationally defined as the time spent with friends in their offline environment. Time spent with friends from their offline environment can enhance one’s quality of friendship and reduce one’s loneliness (Nicpon, et al., 2006). Moreover, quality of friendship has been a good predictor of self-esteem (Hartup, 1996). Hence, it was used as a mediation variable to predict psychosocial self-esteem.

**Psychosocial self-esteem.** Psychosocial self-esteem is operationally defined as the positivity of the person’s evaluation of self (Baumeister, 1998). Psychosocial self-esteem is consistent and durable. It is important because people with high self-esteem are less upset by failures and other forms of bad feedback. In contrast, people with low self-esteem are more likely to be discouraged and dejected by failures (Baumeister, 1998). It was found to be a good predictor of college students’ better
adjustment in their first year in college (Toews & Yazedjian, 2007). It was used as a dependent variable in this study.
CHAPTER 2: LITERATURE REVIEW

In this chapter, two kinds of literature reviews related to the three research questions are presented: (1) Were there any impacts of loneliness on Facebook intensity and motive for using Facebook? (2) Were there any impacts of Facebook intensity and motive for using Facebook on loneliness? (3) Could Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem through the mediation of offline friendship? The first part of the literature review is mainly focused on loneliness and Internet use that relates to my first and second research questions. The second part of the review is centered on Internet use, online and offline friendship and psychosocial self-esteem that relates to my third research question.

**Loneliness and Internet use**

Loneliness was a complex set of feelings and cognitions that reflected the distressing and negative emotional experience emanating from the individual’s perceived deficiencies in intimate and social relationships (Ernst & Cacioppo, 1999). It has also been defined as initial social relationships being less than desired or achieved (Russell, 1996). Loneliness included subjectivity, uneasy feelings and distress, and perceptions of deficiencies in one’s social relations.

From developmental and social psychological perspectives, feelings of loneliness appeared to have roots in childhood and the early attachment processes (Ernst & Cacioppo, 1999). Lonely individuals were more likely to be high in negative affectivity, lack trust in self and others, feel little control over success or failure, and report general dissatisfaction with their relationships compared to non-
lonely individuals. College students were found to be at high risk of loneliness during the transition to college when they were faced with the stresses of living away from their family and lacked their previous social support system.

With the advent of the Internet, more and more researchers have tried to understand the relationship between loneliness and Internet use (e.g., Kraut et al., 2002; McKenna et al., 2002). Some of these researchers studied the impact of Internet use on loneliness while the others addressed the lonely people’s preference for use of the Internet. Although the relationship between loneliness and Internet use has been claimed, this relationship could be very subtle.

**Impacts of Internet Use on Loneliness**

Some researchers found that Internet use led to negative outcomes for the individual user, such as reduced interactions with family and friends, increased depression and loneliness, and neglect of existing close relationships (Brenner, 1997; Kraut et al., 1998; Nie, 2001; Nie & Erbring, 2000). Brenner (1997) surveyed young Internet users who spent an average of 19 hours per week online and found that they reported feeling more isolated from society at the point of testing than before using the Internet. He attributed the isolation feeling of these Internet users to their reduced personal interactions with family members and friends.

Kraut et al. (1998) followed a convenience sample of Pittsburgh residents and their families who did not yet have a computer at home. The researchers gave these families computers and Internet access. After a two-year period, they found a reliable but small increase in the depression and loneliness experienced by these residents as a function of the amount of their Internet use.
On the contrary, some researchers claimed that the Internet enhanced intimacy and family ties, and thus decreased loneliness and depression (Katz & Aspden, 1997; McKenna et al., 1999, 2002; Robinson et al., 2000). Katz and Aspden (1997) reported that when the Internet was placed at home, it did not result in people's dropping out of real life; in fact, it augmented their involvement in traditional familial activities. Robinson et al. (2000) suggested that frequent Internet users might actually have more active social lives than non-users. A majority of Americans surveyed perceived that communication over the Internet had improved their connections to family and friends (Pew Internet & American Life Project, 2000). All of these researchers pointed to the positive impact of Internet uses on the reduction of loneliness and depression.

In addition, a follow-up study conducted by Kraut et al. (2002) found that the influence of Internet use on well-being reported in their early research was more complicated than originally proposed. They found that Internet use was associated with better outcomes for extroverts and worse outcomes for introverts. The introvert was defined as a quiet, reflective person who preferred his or her own company and did not enjoy large social events whereas the extrovert was a friendly person who actively sought company. In particular, extraverts who used the Internet more reported an increase in well-being, including a decreased level of loneliness, decreased negative affect, decreased time pressure, and increased self-esteem, whereas introverts who used the Internet more reported a decrease in well-being.

Although results of the above research pointed to a direct relationship of loneliness and the Internet use, Gross, Juvonen, and Gable (2002) found that time
spent on-line was not associated with dispositional and daily well-being. Sanders and his colleagues (2000) also disagreed about the correlation between Internet use and loneliness.

The mixed findings of Internet use and loneliness in the reviews above partially stemmed from a misunderstanding of Internet use. Research claiming a negative relationship between loneliness and Internet use referred to Internet use as a general term; however, Internet use had many purposes and intentions (Rubin, 2002), for example, information seeking, entertainment, and communication (Wolfradt & Doll, 2001). People using the Internet as an entertainment tool might reduce their time with their family and friends and increase their social isolation and loneliness. On the contrary, people using the Internet as an online communication tool with family and friends might increase their intimacy with other people and might reduce their loneliness. In other words, it was not how much time one spent on the Internet that was associated with loneliness and well-being, but what one did online.

Social network sites basically served as the online communication tools. People using social network sites were predicted to increase interactions with family members and friends, and involvement in public matters. Thus the use of social network sites might have a positive impact on individual well-being.

**Impacts of Loneliness on Internet Use**

McKenna and her colleagues (2000, 2002) conducted a series of studies and found that lonely people were more likely to use online communications and to form close relationships with those they met online. Online communication lacked facial features, such as visible shyness and social anxiety, and that helped individuals who
were less socially skilled foster online friendship. Moreover, people were able to find others who shared the same interests or problems so that they could disclose their inner and true selves easier. Those who located their true self online felt that their online relationships developed more quickly than their offline relationships. They might then be motivated to move their online relationships into face-to-face relationships through a series of stages. By using structural equation modeling, McKenna and her colleagues (2000, 2002) affirmed the causal relationship between difficulty in social interactions, isolation and loneliness and use of the Internet. The researchers further found that lonely people eventually brought this kind of online friendship into their real lives, through telephone conversations, exchanging letters and pictures, and face-to-face meetings. Internet acquaintanceships could and did develop into close and even intimate relationships.

**Loneliness and Internet Use among First-Year College Students**

Environmental change or transition might trigger individuals’ loneliness due to the shift of social ties and friendship. For youth, attending college represented an important transition. Approximately 60% of high school seniors went directly to college after graduation from high school each year (Hamilton & Hamilton, 2006), and many of them left their parents’ home for the first time to attend residential colleges. It was a time marked by instability, a lack of adult responsibilities, and commitments that afforded individuals the opportunity and time to explore prospective life courses related to identity, work, and worldviews (Arnett, 2000, 2006).

Over the course of the first year of college, approximately half of high school
best friendships diminished in closeness, satisfaction, and commitment (Jackson, Soderlind, & Weiss, 2000; Oswald & Clark, 2003). These changes often led to various health and psychosocial problems, such as alcohol and drug abuse (e.g., Capone et al., 2007; Walter et al., 2007), distress (Pritchard et al., 2007), and loneliness (Nicpon et al., 2006).

Among the above-mentioned problems, loneliness had been shown to be particularly prevalent in college students (Nicpon et al., 2006). In fact, it was one of the most common complaints of students reporting to health and counseling centers (Nicpon et al., 2006). Experiencing loneliness as a youth might be more detrimental than at other times of life as it might impede personal growth, identity resolution, and intimacy issue resolution.

With the advent of high quality and low cost network hardware, student culture and campus communities were being created by the Internet. College students might use different online communication tools to communicate with their family, high school friends, and other social groups. Among a variety of communications tools, Facebook was preferred by most of the first-year college students to meet people, develop relationships, and maintain friendship (Holtgren, 2007). Facebook was initially designed for college students as a yearbook (Levy, 2007). Freshmen could use Facebook to maintain their relationship with their high school friends as well as forming and building new relationships with their classmates known in college. Furthermore, Facebook supported loose social ties allowing users to create and maintain larger, diffuse networks of relationships from which students might
potentially draw resources (Donath & Boyd, 2004; Wellman & Haythornthwaite, 2002).

**The Hypothesized Models of Research Question 1 & 2**

Through the study of the first-year college students who felt lonely and used Facebook, we might reveal the relationships between loneliness and the use of social network sites (See Figures 1 & 2). The research questions were (1) to investigate if there were any impacts of loneliness on Facebook intensity and motive for using Facebook, and (2) to investigate if there were any impacts of Facebook intensity and motive for using Facebook on loneliness.

![Figure 1. The hypothesized model of research question 1](image-url)
If such differences between students with or without loneliness on Facebook intensity and motive for using Facebook could be supported by the study, it would have practical implications for using Facebook or similar social network sites. It was suggested that the loneliness was negatively related to self-esteem (e.g., Pressman et al., 2005; Wei, Russell, & Zakalik, 2005) while friendship, which could be built through social network sites, decreased loneliness (e.g., Kraut et al., 1999; McKenna et al., 2002). The relationships among loneliness, self-esteem, and friendship could be reflected in the use of Facebook and thus Facebook intensity and motives of using Facebook might be an indicator of psychosocial self-esteem.

**Internet Use and Psychosocial Self-Esteem**

Self-esteem was a fundamental human motive, also called the self-maintenance motive (Tesser & Campbell, 1982), the motive for self-worth (Covington, 1984), and the self-enhancement motive (Kaplan, 1975) in classic
psychological theories. Self-esteem was a universal desire among human beings to protect and enhance one’s feeling of self-regard (Rosenberg, 1979). Psychosocial self-esteem has been operationally defined as the positivity of the person’s evaluation of self (Baumeister, 1998). It was important because people with high self-esteem were less upset by failures and negative feedback. In contrast, people with low self-esteem were more likely to be discouraged and dejected by failures.

People with high psychosocial self-esteem expected and aspired to be outstanding, and they were not very interested in remedying deficiencies. On the contrary, people with low psychosocial self-esteem focused on remedying their deficiencies rather than cultivating their most promising traits because they were mainly concerned with avoiding failures. People with high self-esteem preferred to avoid tasks following initial failure if they had the option; in contrast, people with low self-esteem turned their attention to their deficiencies and failures in order to bring themselves up to an adequate level (Baumeister, 1998).

Psychosocial self-esteem was highly associated with feeling close and connected to others on a daily basis. Feeling appreciated and understood and sharing pleasant interactions were strong predictors of well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Positive peer relationships contributed positively to youths’ self-esteem and well-being whereas negative peer relationships, such as peer rejection and a lack of close friends, were strong predictors of negative self-esteem (Hartup, 1996).

Internet use could undermine or foster young people’s well-being, depending upon how they used the Internet to communicate with each other (Kraut et al., 1998).
This influence of the internet use on the well-being was realized through the closely related friendship formation online and offline.

**Motivation for Friendship**

One human motive was to establish and maintain relationships with others. Affiliation motivation theory was originally studied by Murray (1938) and further developed by Atkinson (1954). Affiliation motivation was defined as the tendency to form friendships and associations; to greet, join, and live with others; to cooperate and converse sociably with others; to love; and to join groups (Murray, 1938). It was further described as a preference in both thoughts and behaviors for establishing, maintaining and restoring a positive affective relationship (Atkinson, Heyns, & Veroff, 1954). Jackson (1984) defined it as “an inclination to enjoy being with friends and people in general; to accept people readily; to make efforts to win friendships and maintain associations with people” (p. 6).

The desire to make contact with others did not necessarily describe how much affiliative people enjoyed their friendships with others. Many researchers suggested that affiliation motivation contained fear of rejection, which might explain the negative correlations between affiliation and satisfaction with interpersonal relationships (Boyatzis, 1973; McAdams, 1982; Stewart & Chester, 1982). Hence, based on the theoretical background of Sullivan (1953) on the need for interpersonal intimacy and of Bakan (1966) on the communal mode of human existence, McAdams (1980) developed a new construct, intimacy motive, to reflect more affirmative aspects of the need of being with others.

Intimacy motivation was defined as a recurrent preference or readiness for
experiences of close, warm, and communicative interaction with others. McAdams
and his colleagues (1981) documented positive relations between intimacy motivation
and more (a) thoughts about people and relationships, (b) conversations and letter
writing behavior, and (c) positive affect in interpersonal situations. Moreover, people
with intimacy motivation were likely to express themes of love and dialogue in
autobiographical recollections of personally meaningful experiences (McAdams,
Booth, & Selvik, 1981). In addition, intimacy motivation was positively associated
with self-disclosure of personal feelings and vulnerabilities in friendship episodes.
People high in intimacy motivation tended to understand their relationships with their
friends as based on trust and a concern for the well-being of the other more often than
people low in intimacy motivation (McAdams, Healy, & Krause, 1984). Furthermore,
people scoring high in intimacy motivation reported higher levels of subjective well-
being (McAdams & Bryant, 1987).

From the developmental perspective, friendships were ranked the most
important things among children, adolescents, and adults (Klinger, 1977). A
friendship consisted mainly of being attracted to someone who was attracted in return.
It was expected that best friends spent more time with one another than other persons,
offering one another emotional support, including loyalty, trust, intimacy, and fun.
Additionally, youths who perceived being valued and respected by peers were more
likely to report adaptive achievement motivation while youths who perceived peers to
be resistant to school norms were related to maladaptive achievement motivation
(Nelson & DeBacker, 2008). Adaptive achievement motivation was associated with
having a good quality friendship and a best friend who valued academics while
maladaptive achievement motivation was related to having a poor quality friendship. Because of the important role of friendship in one’s life, it had a significant impact on one’s well-being.

**Friendship and Psychosocial Self-Esteem**

The desire for positive friendship was one of the most fundamental and universal of human needs (Baumeister & Leary, 1995). This need had deep roots in evolutionary history and exerted a powerful impact on contemporary human psychological processes. Failure to satisfy this need could have devastating consequences for psychological well-being. People who lacked positive relationships often experienced loneliness, guilt, jealousy, depression, and anxiety. Having close friends was correlated with security (Bowlby, 1969), self-worth (Sullivan, 1953), well-being (Weiss, 1973), and self-esteem (Hartup & Stevens, 1997) in classic psychological theories. However, Hartup (1996) asserted that the developmental outcome of having friends also depended on the identity of one’s friends as well as the quality of one’s relationships with them. Hartup and his colleague used deep structure and surface structure to characterize the friendship relations (Hartup & Stevens, 1997). Deep structure of friendship referred to the social meaning (essence) of relationships. Adolescents and older individuals described an ideal friend mainly as being supportive, a confidant, and trustworthy. Sharing interests, experiences, activities and communicative compatibility were important friendship attributes among adolescents and older individuals. Reciprocity constituted friendship deep structure and it was a significant source of security, self-worth, well-being and self-esteem. These conditions should support successful coping, especially with
developmental transitions such as puberty and college entrance. Surface structures referred to the social exchanges that occurred between friends. Reciprocity among adolescent and college students were centered on common activities (especially socializing), augmented by self disclosure and expectations of loyalty and trust.

From the developmental perspective, several studies showed that people with friends were more socially competent than those who did not; they were more sociable, cooperative, altruistic, self-confident, and less lonely while people seeking clinical assistance were more likely to be friendless than better adjusted individuals. Additionally, people with friends enjoyed greater psychological well-being throughout adulthood and old age than those who did not have friends (Gupta & Korte, 1994; Jackson, Soderlind, & Weiss, 2000; Oswald & Clark, 2003).

Late adolescence was a time in which friendship and peer-group belongingness was particularly salient to psychosocial development (Erikson, 1968). Friendships in this period served six functions (Gottman & Parker, 1987): (1) Companionship: Friendship provided young people with familiar partners, those who were willing to spend time with them and join in collaborative activities. (2) Physical support: Friendship provided time, resources, and assistance. (3) Stimulation: Friendship provided young people with information, entertainment, and excitement. (4) Ego support: Friendship provided support, encouragement, and feedback that helped young people maintain an impression of themselves as competent, attractive, and worthwhile individuals. (5) Social comparison: Friendship provided information about how good young people were doing and how they stood with their friends. (6) Intimacy/ affection: Friendship provided young people with a warm, close, trusting
relationship with other individuals, a relationship that involved self-disclosure.

In summary, we could conclude that having friends was correlated with individuals’ well-being and psychosocial self-esteem (e.g., Gottman & Parker, 1987; Hartup & Stevens, 1997). People tended to spend more time with their friends on common activities. They supported each other physically and emotionally and helped each other cope with developmental transitions, such as puberty, college entrance, and marriage. Offline friendship, referring to time spent with friends from their offline environment, could enhance one’s quality of friendship and foster individual well-being and psychosocial self-esteem.

Internet Use and Friendship

Some researchers found that the anonymity of Internet interactions and lack of traditional facial features (e.g., physical attractiveness) greatly facilitated the formation of friendship online (McKenna & Bargh, 1999, 2000). People were more willing to disclose their true self and find friends who shared common interests via the Internet (McKenna, Green, & Gleason, 2002). This kind of friendship formation was faster than traditional face-to-face friendship building and endured over time.

McKenna and her colleagues’ research correlated friendship formation with Internet use; however, their studies were based on the samples collected from newsgroup and chatrooms, where people mainly met and talked with strangers. It was not clear how online communication with acquaintances maintained and enhanced friendship and increased psychosocial self-esteem. Facebook, on the other hand, was a place where people were likely to communicate with their friends and maintain
friendship. In this regard, it was an ideal place to investigate the above stated relationship.

**The Hypothesized Model of Research Question 3**

The third research question of the study is: Could Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem with the mediation of offline friendship? The hypothesized model (See Figure 3) could be used to address this research question. In this model, Facebook intensity and motive for using Facebook were used to test if they was any association with offline friendship, and offline friendship was used to test if it was associated with psychosocial self-esteem.

![Figure 3. The hypothesized model of research question 3](image)

In summary, through the study of first-year college students, my study has investigated whether there were any impacts of loneliness on the Facebook intensity
and motive for using Facebook and whether motive for using Facebook and Facebook intensity could be used to explore loneliness. Additionally, this study examined if Facebook intensity and motive for using Facebook could have an effect on individual’s psychosocial self-esteem through the mediation of offline friendship. A mediation variable is a third explanatory variable that seeks to identify and explicate the mechanism that underlies an observed relationship between independent variable (those are, Facebook intensity, and motive for using Facebook) and dependent variable (that is, psychosocial self-esteem).
CHAPTER 3: METHOD

In this chapter, major methodological features of the dissertation study are presented in four sections. The section of participants is a summary of sampling method and demographic information. The instrumentation section is an explanation of five major scales used in my dissertation. The procedure section is an outline of the survey collection process. Lastly, the data analyses section is a framework of how to utilize the SEM techniques to test the three hypothesized models.

Participants

First-year college students were chosen to be the target population for this study. As described previously in the literature of loneliness and internet use, first-year college students were to suffer from loneliness and tended to use the internet to connect with their high school friends and relatives (Nicpon et al., 2006). After the Institutional Review Board (IRB) of the University at Albany approved my study, participants were recruited from University of Houston and Houston Community College in the Southern United States. A convenience sampling method (Fowler, 2009) was used based on instructors’ and participants’ consent. The instructors and classes were selected based on the nature of introductory courses as first-year college students were more likely to enroll in these introductory courses.

A total of 1242 students voluntarily filled out the survey during the 2008 fall semester. The return rate of the paper-pencil survey administered in class was 100% (1070 out of 1070). The return rate of the online survey administered through WebCT was unable to be determined as students voluntarily returned a total of 172 completed surveys and they did not need to download my survey from the WebCT if they did
not want to fill it out. Among these 1242 students returning the survey, a total of 340 students were freshmen. However, due to the nature of the study for examining the psychological effects of using Facebook, 118 students who did not use Facebook were excluded from the study and 222 students who used Facebook were selected to be the final sample. Among the 222 students, 181 (82%) students were from University of Houston and 41 (18%) students were from Houston Community College.

Joreskog and Sorbom (2002) recommended that the minimum sample size acceptable for SEM analysis be at the very least 5:1, preferably at least 10:1, relative to the number of parameters to be estimated. In my study, the first hypothesized model had 24 parameters, the second hypothesized models had 23 parameters, and the third hypothesized model covered 28 parameters. As the third hypothesized model had the largest number of parameters, a total sample size of at least 140 and preferably 280 would be adequate for the present analysis. Hence, the final sample size of 222 satisfied Joreskog and Sorbom’s recommendations.

Table 1 summarized the demographic information of the 222 participants. Among these 222 students, the gender distribution was 67% female and 33% male, and 90% (200 out of 222) of the participants were 18- or 19-years-old. The student ethnicity distribution was diverse. It was composed of 23% African American, 34% Asian American, 20% Hispanic, 21% White, and 2% other racial/ethnic background. As shown in Table 1, a large number of students used at least one social network site with 58% of the students using MySpace and 100% of the students using Facebook.
Table 1

*Gender, Age, Ethnicity, Type of Internet Use of the Students who Used Facebook (N = 222) and the Students who did not Use Facebook (N = 118)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facebook</td>
<td>Non-Facebook</td>
</tr>
<tr>
<td></td>
<td>users</td>
<td>users</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>148</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>67%</td>
<td>61%</td>
</tr>
<tr>
<td>Male</td>
<td>74</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>33%</td>
<td>39%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>153</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>69%</td>
<td>49%</td>
</tr>
<tr>
<td>19</td>
<td>47</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>21%</td>
<td>20%</td>
</tr>
<tr>
<td>20</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>22 or above</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>7%</td>
<td>25%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African</td>
<td>50</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>23%</td>
<td>25%</td>
</tr>
<tr>
<td>American</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>75</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>34%</td>
<td>22%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>46</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>21%</td>
<td>5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>45</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>47%</td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Type of Internet use (for students)</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

27
There are at least two issues concerning the representativeness of the final sample: (1) the similarities and differences between the 222 students who used Facebook and the 118 students who did not use Facebook (2) the similarities and differences between the 222 students and the general first year college students.

First, as show in Table 1, these two groups did not differ much in the frequency of gender and age, but did differ in ethnicity. Among the 222 Facebook user students, 67% were female and 33% were male while among the 118 non-Facebook users, 61% were female and 39% were male. The number of female was more than the number of male in these two groups. Majority of the Freshmen were 18- or 19-year-old; 90% were 18- or 19-year-old Facebook users while 69% were non-Facebook users. Regarding the ethnicity, African American and Others were more or less the same among these two groups, 34% of Asian American used
Facebook while 22% of them did not use Facebook. 21% of Caucasian used Facebook while only 5% of them did not use Facebook. 20% of Hispanic used Facebook while 47% of them did not use Facebook.

Second, as showed in Table 2, the 222 students and the freshmen of University of Houston did not differ much in the frequency of ethnicity, but differed in gender distribution. The ethnicity at University of Houston was nearly evenly distributed, from 20% African American, 24% Asian American and Hispanic each, to 26% Caucasian while the ethnicity of 222 Facebook users consisted of 23% African American, 34% Asian American, 21% Caucasian and 20% Hispanic. Only the proportion of Asian American (34%) was slightly higher in regard to Facebook use. In general, both groups had higher female distribution; University of Houston had 52% of female while 222 students consisted of 67% female.

Table 2

*Comparison of Gender and Ethnicity between the 222 Facebook Users and Freshmen of University of Houston (UH) Enrolled in 2006-2007*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Final sample</td>
<td>UH freshmen</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>148</td>
<td>1,793</td>
</tr>
<tr>
<td>Male</td>
<td>74</td>
<td>1,642</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>50</td>
<td>687</td>
</tr>
</tbody>
</table>
Due to the simplicity of the HCC website, no HCC students’ demographic information can be found.

In general, the final 222 students could represent the general freshmen population in the University of Houston with regard to their gender and ethnicity. Although the proportion of female gender was higher than the general freshmen population, the proportion of male gender might be affected by the devastating Hurricane Ike on September 4, 2008. After the Hurricane Ike, thousands of people lost their home and a lot of infrastructures were destroyed. Many people were needed to rebuild the city, and male students might quit the schools due to family and financial issues. In fact, many instructors told me that some of the students never attended school anymore.

**Instrument**

The instrument used in the present study included six components: demographic information, the UCLA Loneliness Scale, Facebook Intensity Scale, Motive for using Facebook Scale, Offline Friendship Scale, and the Rosenberg Self-Esteem Scale. The UCLA Loneliness Scale and the Rosenberg Self-Esteem Scale were published instruments that had widely been used and were free to be used. The other four components were constructed by the author. Together, the entire six-
section instrument was named as the College Student Facebook Use Questionnaire (see Appendix B).

**Demographic Information**

This section was used to acquire the general demographic information and the habits of Internet usage of the participants. There were seven questions related to gender, age, ethnicity, education level, hours of Internet use in the past six months, type of Internet use to communicate, and usage of Facebook.

**Loneliness**

The 20-item UCLA Loneliness Scale (Russell, 1996) was used to measure students’ level of loneliness. Russell (1996) used four samples; college students, teachers, nurses, and the elderly to establish the reliability, validity, and factor structures of his Scale. His results indicated that (a) the UCLA Loneliness Scale was highly reliable, both in terms of internal consistency (Cronbach’s alpha ranging from .89 to .94) and test-retest reliability over a one-year period ($r = .73$); and (b) confirmatory factor analyses indicated that a model incorporating a global bipolar loneliness factor provided a very good fit for the data across the four samples.

Principal component extraction with the rotation of varimax was utilized to validate the measurement variable of loneliness. Exploratory factor analysis was used to reduce data and analyze all the variance, while varimax was to minimize factor covariation to produce factors which were uncorrelated (Tabachnick & Fidell, 2001). Using .40 as a cutting point, the result indicated that seven items (items 3, 4, 7, 11, 14, 16 & 19) had cross-loadings and these seven items were removed from the study. Table 3 showed the factor loadings for 20 items of the loneliness scale.
Table 3

*Factor Loadings for 20 Items of the Loneliness Scale*

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO10</td>
<td>.76</td>
<td>.16</td>
<td>.24</td>
<td>.19</td>
</tr>
<tr>
<td>LO6</td>
<td>.75</td>
<td>.33</td>
<td>.07</td>
<td>.03</td>
</tr>
<tr>
<td>LO9</td>
<td>.72</td>
<td>-.08</td>
<td>.20</td>
<td>.28</td>
</tr>
<tr>
<td>LO1</td>
<td>.65</td>
<td>.09</td>
<td>.19</td>
<td>.12</td>
</tr>
<tr>
<td>LO5</td>
<td>.62</td>
<td>.26</td>
<td>.19</td>
<td>.15</td>
</tr>
<tr>
<td>LO13</td>
<td>.18</td>
<td>.77</td>
<td>.22</td>
<td>.14</td>
</tr>
<tr>
<td>LO12</td>
<td>.11</td>
<td>.71</td>
<td>.12</td>
<td>.13</td>
</tr>
<tr>
<td>LO18</td>
<td>.17</td>
<td>.66</td>
<td>.06</td>
<td>.34</td>
</tr>
<tr>
<td>LO14</td>
<td>.14</td>
<td>.56</td>
<td>.30</td>
<td>.48</td>
</tr>
<tr>
<td>LO8</td>
<td>.26</td>
<td>.47</td>
<td>.19</td>
<td>.35</td>
</tr>
<tr>
<td>LO19</td>
<td>.41</td>
<td>.23</td>
<td>.77</td>
<td>.05</td>
</tr>
<tr>
<td>LO20</td>
<td>.34</td>
<td>.25</td>
<td>.74</td>
<td>.09</td>
</tr>
<tr>
<td>LO3</td>
<td>-.04</td>
<td>.34</td>
<td>.57</td>
<td>.48</td>
</tr>
<tr>
<td>LO15</td>
<td>.29</td>
<td>-.04</td>
<td>.57</td>
<td>.25</td>
</tr>
<tr>
<td>LO16</td>
<td>.48</td>
<td>.32</td>
<td>.54</td>
<td>-.06</td>
</tr>
<tr>
<td>LO17</td>
<td>.26</td>
<td>.08</td>
<td>-.07</td>
<td>.72</td>
</tr>
<tr>
<td>LO2</td>
<td>.15</td>
<td>.29</td>
<td>.16</td>
<td>.69</td>
</tr>
<tr>
<td>LO4</td>
<td>.02</td>
<td>.32</td>
<td>.57</td>
<td>.58</td>
</tr>
<tr>
<td>LO11</td>
<td>.18</td>
<td>.43</td>
<td>.27</td>
<td>.58</td>
</tr>
<tr>
<td>LO7</td>
<td>.17</td>
<td>.42</td>
<td>.36</td>
<td>.49</td>
</tr>
</tbody>
</table>
After removing the seven items, principal component analysis with the varimax rotation was run again with the remaining 13 items. Two factors were extracted and the results were shown in Table 4. The first factor was positive items of loneliness and the second factor was negative items of loneliness. These 13 items were reviewed and found that the items in the first factor were better measuring loneliness than those in the second factor. Hence, items 1, 5, 6, 9, 10, 15 & 20 in the first factor were retained and run through the same factor analysis. Using the Kaiser eigenvalues criterion, these seven items explained 52.59% of the variance, with factor loadings ranging from .51 to .82 (see Table 5). The rule of thumbs for good factor loadings were (1) the factor loading value was .50 or greater, and (2) the factors explained 50% or above variance (Tabachnick & Fidell, 2001). Reliability (coefficient alpha) of these seven items was .84. In the scale, responses could range from 1 as “strongly disagree” to 7 as “strongly agree,” a higher score indicating students suffered less from loneliness while a lower score indicating students had loneliness.

Table 4

*Factor Loadings for 13 Items of the Loneliness Scale*

<table>
<thead>
<tr>
<th>Items/Factors</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO10</td>
<td>.78</td>
<td>.26</td>
</tr>
<tr>
<td>LO9</td>
<td>.76</td>
<td>.09</td>
</tr>
<tr>
<td>LO1</td>
<td>.72</td>
<td>.08</td>
</tr>
<tr>
<td>LO6</td>
<td>.71</td>
<td>.23</td>
</tr>
<tr>
<td>Items</td>
<td>Factor loadings of Loneliness</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>LO10</td>
<td>.82</td>
<td></td>
</tr>
<tr>
<td>LO6</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>LO5</td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>LO1</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>LO20</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>LO9</td>
<td>.69</td>
<td></td>
</tr>
<tr>
<td>LO15</td>
<td>.51</td>
<td></td>
</tr>
</tbody>
</table>
Facebook Intensity

This Scale of Facebook Intensity was created to measure the number of Facebook "friends" and the amount of time spent on Facebook on a typical day, the extent to which the participants were actively engaged in Facebook activities, and their attitudes towards Facebook (Ellison et al., 2007). Seven questions were asked and the reliability of the scale was .85 based on the sample size of 222 students who used Facebook. Exploratory factor analysis was performed to reduce the factors and the results were presented in Table 6. All 7 items were loaded in one factor, with factor loadings ranging from .59 to .87. All items explained 53.37% of the variance.

Response options ranged from 1 as strongly disagree to 7 as strongly agree, a higher score indicating students had a favorable attitude towards Facebook and Facebook usage, and a lower score indicating students had a less favorable attitude towards Facebook and Facebook usage.

Table 6

Factor Loadings for the Facebook Intensity Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA1</td>
<td>.87</td>
</tr>
<tr>
<td>FA2</td>
<td>.67</td>
</tr>
<tr>
<td>FA3</td>
<td>.76</td>
</tr>
<tr>
<td>FA4</td>
<td>.77</td>
</tr>
<tr>
<td>FA5</td>
<td>.78</td>
</tr>
<tr>
<td>FA6</td>
<td>.59</td>
</tr>
<tr>
<td>FA7</td>
<td>.64</td>
</tr>
</tbody>
</table>
Motive for using Facebook

As there was not any instrument located about Motive for using Facebook, only a general discussion available (Dwyer et al., 2007), a pilot study was conducted to attempt to understand why people used Facebook. The researcher asked 8 of her friends who frequently used social networking websites, especially Facebook, to communicate with their friends to brainstorm a list of reasons why they used Facebook. A list of reasons for using Facebook was sketched out to develop the Motive for Using Facebook instrument.

This scale was to measure the participants’ motive for using Facebook. Eight questions were asked about the motive for using Facebook. For example, “I use Facebook to keep contact with friends,” and “I use Facebook to share my ups and downs with other friends.” The answers ranged from 1 as strongly disagree to 7 as strongly agree, a higher score indicating students had higher motive for using Facebook whereas a lower score indicating students had lower motive for using Facebook to communicate with friends. The Cronbach’s alpha was .83 based on the 222 sample size. For data reduction purpose, exploratory factor analysis was used and the results indicated that all 8 items were loaded on one factor which explained 75.24% of the variance. The results were presented in Table 7. As shown in Table 7, the factor loadings ranged from .83 to .89.
### Table 7

**Factor Loadings for the Motive for Using Facebook Scale**

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO1</td>
<td>.88</td>
</tr>
<tr>
<td>MO2</td>
<td>.89</td>
</tr>
<tr>
<td>MO3</td>
<td>.86</td>
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<tr>
<td>MO4</td>
<td>.89</td>
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<td>MO5</td>
<td>.85</td>
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<td>MO6</td>
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</tr>
<tr>
<td>MO7</td>
<td>.87</td>
</tr>
<tr>
<td>MO8</td>
<td>.87</td>
</tr>
</tbody>
</table>

### Offline Friendship

This scale was developed to measure how much time the participants communicated with their friends and acquaintances offline. Four questions were asked about how often the participants spent time with their friends. First the participants were asked to think about friends who were in their social network site in Facebook. Then the participants were asked to respond to the following questions: (a) “How often do you meet one or more of these friends offline?” (b) ”How often do you and these friends go to one place and do things together?” (c) ”How often do you hang out and have fun with one or more of these friends?” and (d) “How often do you contact one or more these friends via telephone?” Response options ranged from 1 (never) to 7 (daily). A higher score meant that students tended to contact their friends
in a daily basis while a lower score meant that students seldom contacted their friends.

The reliability alpha of the final study was .89. Exploratory factor analysis was
performed to reduce the data and the results were presented in Table 8. As shown in
Table 8, the factor loadings ranged from .82 to .91 and all 4 items explained 75.44% of
the variance.

Table 8

*Factor Loadings for the Offline Friendship Scale*

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>OF1</td>
<td>.87</td>
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<tr>
<td>OF2</td>
<td>.91</td>
</tr>
<tr>
<td>OF3</td>
<td>.87</td>
</tr>
<tr>
<td>OF4</td>
<td>.82</td>
</tr>
</tbody>
</table>

**Psychosocial Self-esteem**

The scale was used to measure psychosocial self-esteem. It was measured by
the seven-item Rosenberg Self-Esteem Scale (RSES: 1989). The Rosenberg Self-
Esteem Scale has been used widely since its inception in 1965. The validity of the
measure was well established (Gray-Little, Williams, & Hancock, 1997). Many
studies demonstrated its good reliability (Ellison et al., 2007; Schmitt & Allik, 2005).
For example, the Cronbach’s alpha reported in Ellison et al. (2007) was 0.87.
Cronbach’s alpha ranged from .80 to .90 and split-half measures ranged from .79
to .85 in 53 western English-speaking countries according to Schmitt and Allik
(2005).
Responses ranged from 1 as *strongly disagree* to 7 as *strongly agree*, a higher score meant that students had higher self-esteem whereas a lower score indicated that students had lower self-esteem. Reliability of this scale was .88. For data reduction purposes, exploratory factor analysis was used and the result indicated that all 7 items loaded in one factor, with factor loadings ranging from .64 to .84. These items explained 58.4% of the variance. The results were presented in Table 9.

Table 9

*Factor Loadings for the Psychosocial Self-Esteem Scale*

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1</td>
<td>.76</td>
</tr>
<tr>
<td>PS2</td>
<td>.81</td>
</tr>
<tr>
<td>PS3</td>
<td>.69</td>
</tr>
<tr>
<td>PS4</td>
<td>.65</td>
</tr>
<tr>
<td>PS5</td>
<td>.76</td>
</tr>
<tr>
<td>PS6</td>
<td>.84</td>
</tr>
<tr>
<td>PS7</td>
<td>.82</td>
</tr>
</tbody>
</table>

**Procedure**

An Institutional Review Board (IRB) protocol of this study was submitted to the University at Albany in the 2008 spring semester, and it was reviewed and approved by the IRB within two weeks. In order to recruit the subjects, I first searched universities close to my home in the Houston metropolitan area in Texas,
USA. Five universities and one community college which were less than 30 miles from my residence and had undergraduate programs were found and selected.

In the beginning of the 2008 fall semester, I sent an email to 45 instructors who taught undergraduate introductory courses (e.g. Introduction to Psychology, Introduction to Politics) in these universities or colleges to ask for their permission to administer the College Student Facebook Use Questionnaire in their respective class. One instructor from one large public university and two instructors from the community college consented. Then an IRB protocol of my study was subsequently filed with the public university and it was approved shortly. The community college did not have Institutional Review Boards, but the community college instructors accepted the University at Albany IRB. One instructor from the community college forwarded my email request to other instructors who taught undergraduate classes; five more instructors contacted me directly and allowed me to collect data in their classes.

From October 14 to November 20 of 2008, I went to 18 classes at the university and community college to collect data. The instructors briefly introduced me to their students and told them that they would get a credit for their participation in my study. Then the instructors left the classroom. I introduced myself to the students and read my recruitment script (see Appendix C for the detail of my recruitment script) before I distributed the College Student Facebook Use Questionnaire to each class. Students took 10-20 minutes to finish the questionnaire and returned it to me during each class. The return rate of the in-class administrated survey was 100% (Jaeger, 1984). Additionally, three instructors in the community
college who taught seven online courses posted my questionnaire and recruitment script in their WebCT and their students emailed the completed questionnaires to me. As students voluntarily downloaded the survey from their WebCT, no return rate was counted.

**Data Analysis**

The software of Analysis of Moment Structures (AMOS 7.0; Arbuckle, 2006) was used to run structural equation modeling (Bollen & Long, 1993). Specifically, three models were used to address the three research questions. The first and second hypothesized models were to explain the college students’ loneliness, Facebook intensity and their motive for using Facebook, and the third hypothesized model was to describe how Facebook intensity and their motive for using Facebook associated with their offline friendship, both with strong and weak ties, then to relate to their psychosocial self-esteem.

**Research Questions 1 & 2**

The hypothesized structural models were developed to answer the research question 1 “Were there any impacts of loneliness on Facebook intensity and motive for using Facebook?” and 2 “Were there any impacts of Facebook intensity and motive for using Facebook on loneliness?”

**The hypothesized measurement models of research question 1 & 2.** There were three measurement models: Loneliness (see Figure 4), Facebook Intensity (see Figure 5), and Motive for Using Facebook (see Figure 6). The measurement model of Loneliness contained seven items which were extracted from the exploratory factor analysis in the Instrument section. The measurement model of Facebook Intensity
consisted of seven elements. The measurement model of Motive for Using Facebook had 8 items which were obtained from the exploratory factor analysis in the Instrument section.

Figure 4. The hypothesized measurement model of loneliness
Figure 5. The hypothesized measurement model of Facebook intensity
The models were assessed with SEM analysis to determine how well they fit the data collected. When assessing a model’s overall goodness-of-fit, it is usually recommended to use several fit indices (Hu & Bentler, 1999; Tabachnick & Fidell, 2001). For the current study, six goodness-fit-indices were employed, including the
chi-square test statistics ($\chi^2$), the normed chi-square test statistic ($\chi^2$/df), the comparative fit index (CFI, Bentler, 1990), the Tucker-Lewis index (TLI, Bollen, 1989), the goodness of fit index (GFI, Joreskog & Sorbom, 1989), and the root mean squared error of approximation (RMSEA, Steiger, 1990).

The chi-square test statistics tested a null hypothesis whether there was perfect model fit in the population. A statistically non-significant $\chi^2$ value meant to have a perfect model fit. However, the chi-square might be proved to be contradictory compared to other goodness of fit indices if a large sample size was used because the chi-square value usually would be large with a large sample size and hence the null hypothesis would be rejected (Bentler & Bonnett, 1980). Hence, chi-square tests were examined in combination with other goodness of fit measures in order to gain a true assessment of the fit of the model. The normed chi-square test statistic was an alternative to the $\chi^2$ because it was less sensitive to sample size. It has been suggested that the normed chi-square test statistic values below 5 are considered acceptable (Bollen, 1989).

The comparative fit index (CFI) was directly based on the non-centrality measure (Bentler, 1990). CFI ranged from 0 to 1; values above .90 suggested an adequate model fit, and values exceeding .95 were considered a good fit (Hu & Bentler, 1999).

The Tucker-Lewis index (TLI) was also known as the Bentler-Bonett non-normed fix index (NNFI). The typical range for TLI lied between zero and one, but it was not limited to that range. TLI values close to 1 indicated a very good fit.
The goodness of fit index (GFI) equaled to 1 - (chi-square for the default model/chi-square for the null model) (Joreskog & Sorbom, 1989). GFI was the percent of observed covariances explained by the covariances implied by the model. GFI ranged from 0 to 1, with values between .80 and .89 considered a reasonable fit, and values above .90 considered a good fit.

The root mean square error of approximation (RMSEA) was based on the non-centrality parameter (Bollen and Long, 1993). Good model fits had an RMSEA of .05 or less, values of .06 - .08 indicated a reasonable fit, values greater than .10 indicated a poor fit (Hu & Bentler, 1999).

The hypothesized structural model of research question 1. When assessing a model’s overall goodness-of-fit, it was usually recommended to use several fit indices (Tabachnick & Fidell, 2001). The same fit indices used in the measurement models, including the chi-square test statistics ($\chi^2$), the normed chi-square test statistic ($\chi^2$/df), the comparative fit index (CFI, Bentler, 1990), the Tucker-Lewis index (TLI, Bollen, 1989), the goodness of fit index (GFI, Joreskog & Sorbom, 1989), and the root mean squared error of approximation (RMSEA, Steiger, 1990) would be applied in the structural models. In the present model, Facebook Intensity and Motive for Using Facebook could not be correlated due to SEM’s identification problem. An underidentified model would be obtained if a curved two-headed arrow was added. An underidentified model was one in which the number of parameters to be estimated exceeds the number of variances and covariances. As such, the model contained insufficient information for the purpose of attaining a determinate solution of parameter estimation; that was, an infinite number of solutions were possible for an
underidentified model (Bryne, 2001). Hence, a curved two-headed arrow signifying unanalyzed association between Facebook Intensity and Motive for using Facebook was not applied in this model (Bollen, 1989, p.33).

In addition, the standardized path coefficients from Loneliness to Motive for Using Facebook and from Loneliness to Facebook Intensity were examined. A statistically significant path coefficient meant that loneliness could be associated with Facebook intensity and/or motive for using Facebook. A statistically non-significant path coefficient meant that the path was not supported in the hypothesized model.
Figure 7. The hypothesized structural model to assess the impacts of loneliness on Facebook intensity and motive for using Facebook

The hypothesized structural model of research question 2. In order to answer the reverse effect of the first research question, “Are there any impacts of Facebook intensity and motive for using Facebook on loneliness?”, the hypothesized
structural model (Figure 8) was built. Its elements were the same as the above model. The same fit indices mentioned in the first hypothesized structural model were utilized to assess the second hypothesized structural model fit. Facebook Intensity and Motive for Using Facebook were correlated based on previous theory (Gardner & Lambert, 1959). The curved two-headed arrow between Facebook Intensity and Motive for using Facebook signified unanalyzed association between these two variables (for a specific illustration, see Table 2.6, p.33, Bollen, 1989).
Figure 8. The hypothesized structural model to assess the impacts of Facebook intensity and motive for using Facebook on loneliness
**Research Question 3**

The hypothesized structural model was constructed to answer the third research question: Can Facebook intensity and motive for using Facebook enhance individuals' psychosocial self-esteem, with the mediation of offline friendship?

The hypothesized measurement models of research question 3. Facebook Intensity and Motive for Using Facebook measurement models were the same as above and thus they were not repeated here. The measurement model of Offline Friendship (see Figure 9) contained four items and the measurement model of Psychosocial Self-Esteem (see Figure 10) consisted of seven items. The same fit indices mentioned in research question 1 were used to assess these two measurement models fit.

*Figure 9. The hypothesized measurement model of offline friendship*
The hypothesized structural model of research question 3. SEM analysis was used to answer the second research question “Can Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem, with the mediation of offline friendship?” (see Figure 11), the same six fit indices mentioned above were applied to the present question to estimate the parameters of the psychosocial well-being from motive for using Facebook and Facebook intensity, with the mediation of offline friendship. Facebook Intensity and Motive for Using Facebook were associated with each other and hence a curved two-headed arrow was applied between them. Path coefficients from Facebook Intensity to Offline Friendship, from Motive for Using Facebook to Offline Friendship, and from Offline Friendship to Psychosocial Self-Esteem were examined to see whether the paths were significant at the level of .05.
Figure 11. The hypothesized structural model to assess the relationships among Facebook intensity, motive for using Facebook, offline friendship, and psychosocial self-esteem.
CHAPTER 4: RESULTS

In this chapter, preliminary data analysis is first displayed. Then the results of the structural equation modeling are presented to address the three research questions.

**Preliminary Data Analysis**

**Data Screening**

A check on accuracy of data entry and missing data for the data set was done through SPSS FREQUENCIES. There were no missing cases and skewness and kurtosis were well within expected values of all variables. There was no single missing value perhaps because students were all motivated to receive the credit. The minimum and maximum values, means, and standard deviations of each of the variables were inspected for plausibility. All the variables were within their range of values.

Z-score of each variable was used to detect univariate outliers through SPSS DESCRIPTIVES and FREQUENCIES. Univariate outliers are cases with an extreme value on one variable, and cases with Z-scores larger than 3.29 \((p < .001, \text{two-tailed test})\) are potential outliers (Tabachnick & Fidell, 2001). Thirteen cases in PS1, PS2, PS3 & PS4 were found to have large Z-scores, however, further inspection indicated that none of them was out of the range of values, so these cases were retained.

Multivariate outliers are cases with an unusual combination of scores on two or more variables (Tabachnick & Fidell, 2001). The data were screened for multivariate outliers through SPSS REGRESSION. None of the cases was found to be multivariate outliers.
Descriptive Statistics

Descriptive statistics of the measures are presented in Tables 10. As shown in Table 10, students who used Facebook were lonely, with $M = 5.6$ ($SD = 0.65$) on a seven-point Likert scale of Loneliness and they were generally high in psychosocial self-esteem, with $M = 5.84$ ($SD = 1.03$) on a seven-point Likert scale of Psychosocial Self-Esteem. Students who used Facebook had favorable feelings on Facebook, with $M = 4.16$ ($SD = 1.46$) on a seven-point Likert scale of Facebook Intensity. On average, students had moderately high in Motive for Using Facebook, with $M = 3.87$ ($SD = 1.27$) on a seven-point Likert scale of Motive for Using Facebook. And students who used Facebook generally met their friends once per week or several times per week, with $M = 4.96$ ($SD = 1.56$) on a seven-point Likert scale of Offline Friendship.

Table 10

Means, Standard Deviations of Loneliness, Psychosocial Self-Esteem, Facebook Intensity, Motive for Using Facebook, and Offline Friendship ($N = 222$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>$SD$</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Loneliness</td>
<td>5.60</td>
<td>0.65</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2. Psychosocial Self-Esteem</td>
<td>5.84</td>
<td>1.03</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>3. Facebook Intensity</td>
<td>4.16</td>
<td>1.46</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>4. Motive for using Facebook</td>
<td>3.87</td>
<td>1.27</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>5. Offline Friendship</td>
<td>4.96</td>
<td>1.56</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>
Correlations

Pearson correlation coefficients were calculated to examine the intercorrelations among Loneliness, Psychosocial Self-Esteem, Facebook Intensity, Motive for using Facebook, and Offline Friendship respectively. As shown in Table 11, Loneliness was negatively correlated with other variables except Motive of Using Facebook; the correlation coefficient between Loneliness and Psychosocial Self-Esteem ($r = -.59$, $p < .01$) was negative and moderately high. The correlation coefficient between Loneliness and Facebook Intensity ($r = -.15$, $p < .05$), between Loneliness and Motive of Using Facebook ($r = -.09$, $p > .05$), and between Loneliness and Offline Friendship ($r = -.18$, $p < .01$) were negative and slightly strong. The correlation coefficient between Facebook Intensity and Motive of Using Facebook ($r = .50$, $p < .01$), between Facebook Intensity and Offline Friendship ($r = .25$, $p < .01$), between Motive of Using Facebook and Offline Friendship ($r = .15$, $p < .01$) were positive. Psychosocial Self-Esteem did not correlate with other variables.

Table 11

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
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<td>1. Loneliness</td>
<td>1.00</td>
<td>-.59**</td>
<td>-.15*</td>
<td>-.09</td>
<td>-.18**</td>
</tr>
<tr>
<td>2. Psychosocial Self-Esteem</td>
<td>1.00</td>
<td>.13</td>
<td>-.02</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>3. Facebook Intensity</td>
<td>1.00</td>
<td>.50**</td>
<td>.25**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Motive for using Facebook</td>
<td>1.00</td>
<td>.15*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Offline Friendship</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*p<.05. **p<.01.

Structural Equation Modeling Analysis

Research Question 1 and 2

Prior to estimating the first and second hypothesized models of research question 1 and 2 (see Figures 6 & 7 in Chapter 3), normality of the data was examined by checking univariate skewness and kurtosis. As shown in Table 12, the skewness values and kurtosis values were normally distributed. The distributions of observed indicators were also checked according to Curran, West, and Finch (1996) and found to be normal.

Table 12

Skewness and Kurtosis of the Variables in the Hypothesized Model of Research Question 1 and 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO1</td>
<td>.57</td>
<td>.27</td>
</tr>
<tr>
<td>LO5</td>
<td>.70</td>
<td>-.42</td>
</tr>
<tr>
<td>LO6</td>
<td>.66</td>
<td>-.24</td>
</tr>
<tr>
<td>LO9</td>
<td>.76</td>
<td>-.09</td>
</tr>
<tr>
<td>LO10</td>
<td>.51</td>
<td>-.27</td>
</tr>
<tr>
<td>LO15</td>
<td>.77</td>
<td>-.35</td>
</tr>
<tr>
<td>LO20</td>
<td>.92</td>
<td>-.09</td>
</tr>
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<td>FA1</td>
<td>-.67</td>
<td>-.77</td>
</tr>
<tr>
<td>FA2</td>
<td>.71</td>
<td>-.92</td>
</tr>
</tbody>
</table>
Fitting the measurement models of research question 1 & 2. The measurement model of loneliness (see Figure 12) represented a goodness of fit to the data, $\chi^2 (14, N = 222) = 30.72, p < .01$, the normed chi-squared test statistic ($\chi^2/df$) = 2.19, CFI = 0.97, TLI = 0.95, GFI = 0.96, and RMSEA = 0.07. All indices were desirable in values, except for the chi-square test statistic, for which it was common to be significant to the relatively large sample sizes (Bollen, 1989; Nickerson & Martens, 2008).

Standardized factor loadings reflect unique relationships between each observed indicator (i.e., each survey item) and its corresponding latent variables.
(Arbuckle & Wothke, 1999). All standardized factor loadings were satisfactory, ranging from .43 to .79, and all were significant at the level of .001.

![Diagram of the fitted measurement model of Loneliness with standardized factor loadings](image)

Figure 12. The fitted measurement model of Loneliness with standardized factor loadings

The measurement model of Facebook Intensity (see Figure 13) represented a goodness of fit to the data, $\chi^2 (12, N = 222) = 37.76, p < .05$, the normed chi-squared test statistic ($\chi^2/df$) = 3.15, CFI = 0.96, TLI = 0.93, GFI = 0.96 and RMSEA = 0.09. All indices were desirable in values, except for the chi-square test statistic, for which it was common to be significant to the relatively large sample sizes. All standardized factor loadings were excellent, ranging from .47 to .83, and all were significant at the level of .001.
Figure 13. The fitted measurement model of Facebook intensity with standardized factor loadings

The measurement model of Motive for using Facebook (see Figure 14) represented a goodness of fit to the data with $\chi^2 (15, N = 222) = 15.70, p > .05$, the normed chi-squared test statistic ($\chi^2/df$) = 1.05, CFI = 0.99, TLI = 0.99, GFI = 0.98, and RMSEA = 0.01. All fit indices were desirable. Additionally, all standardized factor loadings were satisfactory, ranging from .41 to .83, and all were significant at the level of .001.
Fitting the structural model of research question 1. After the measurement models were found to be acceptable to measure all the three latent constructs, the hypothesized structural model of research question 1a was estimated (Figure 15). Most of the indices were not satisfactory. The chi-square test of model fit was statistically significant ($\chi^2(200, N = 222) = 404.05, p < .001$), normed chi-square test statistic was 2.02, CFI was 0.89, TLI was 0.87, GFI was 0.87, and RMSEA was 0.07. Hence, the hypothesized structural model of research question 1a did not fit the data well.
Following Byrne’s (2001) suggestions, the bootstrap procedure was used to validate the model fit and parameter estimation of the data with moderate sample size.

* *p < .05*

Figure 15. The fitted structural model of research question 1
Bootstrapping is a resampling procedure by which the original sample is considered to represent the population (Byrne, 2001). The results of using model of research question 1 to fit 1000 bootstrap samples indicated that all of the fit indices and parameter estimates with the 1000 bootstrap samples matched well those with the original sample using model of research question 1, confirming the robustness of the model fit and parameter estimation in model of research question 1a. Thus, this model was used to generate the results in Figure 15.

**Were there any impacts of loneliness on Facebook intensity and motive for using Facebook?** As the hypothesized structural models did not fit the data well, it suggested that loneliness neither predicted the first-year college students’ Facebook use nor their increased motive for using Facebook. Hence, the results suggested that this model should not be used to estimate impacts of loneliness on Facebook intensity and motive for using Facebook.

**Fitting the structural model of research question 2.** The hypothesized structural model of research question 2 represented a good fit to the data, The chi-square test of model fit was statistically significant $\chi^2 (199, N = 222) = 343.63, p < .001$, normed chi-square statistic ($\chi^2$/df) was 1.73, CFI was 0.92, TLI was 0.91, GFI was 0.88, and RMSEA was 0.06. Figure 15 shows the fitted model with estimated path coefficients.

Following Byrne’s (2001) suggestions, the bootstrap procedure was used to validate the model fit and parameter estimation of the data with moderate sample size. The results of using model of research question 2 to fit 1000 bootstrap samples indicated that all of the fit indices and parameter estimates with the 1000 bootstrap
samples matched well those with the original sample using model of research question 2, confirming the robustness of the model fit and parameter estimation in model of research question 1b. Thus, this model was used to generate the results in Figure 16.

Were there impacts of motive for using Facebook and Facebook intensity on loneliness? The hypothesized structural model fit the data well, there was a significant path from Facebook intensity to Loneliness ($\beta = -.21, p < .05$) whereas there was no any significant path from Motive for using Facebook to Loneliness ($\beta = .02, p > .05$). For the purpose of presentation, my final model included the insignificant path. The result indicated that every one standardized unit increase in Facebook intensity was associated with .21 standardized unit of decrease in students’ loneliness. Results suggested that Facebook intensity reduced students’ loneliness but the motive for using Facebook did not significantly increase students’ loneliness.
Figure 16. The fitted structural model of research question 2

*p < .05, ***p < .001
Research Question 3

Prior to estimating the hypothesized model, normality of the data was examined. Univariate indices of skewness and kurtosis were conducted and revealed that skewness and kurtosis values were normally distributed (see Table 13).

Table 13

Skewness and Kurtosis of the Variables in the Hypothesized Model of Research Question 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA1</td>
<td>-.67</td>
<td>-.77</td>
</tr>
<tr>
<td>FA2</td>
<td>.71</td>
<td>-.92</td>
</tr>
<tr>
<td>FA3</td>
<td>-.05</td>
<td>-1.19</td>
</tr>
<tr>
<td>FA4</td>
<td>-.87</td>
<td>-.30</td>
</tr>
<tr>
<td>FA5</td>
<td>-.30</td>
<td>-1.32</td>
</tr>
<tr>
<td>FA6</td>
<td>.36</td>
<td>-.60</td>
</tr>
<tr>
<td>FA7</td>
<td>-.23</td>
<td>-1.05</td>
</tr>
<tr>
<td>MO1</td>
<td>-1.69</td>
<td>2.94</td>
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<tr>
<td>MO2</td>
<td>.33</td>
<td>-.92</td>
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<td>.99</td>
<td>-.08</td>
</tr>
<tr>
<td>MO6</td>
<td>.05</td>
<td>-1.37</td>
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<td>MO7</td>
<td>-.50</td>
<td>-.90</td>
</tr>
<tr>
<td>MO8</td>
<td>.01</td>
<td>-1.26</td>
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</tbody>
</table>
Fitting the measurement models of research question 3. The measurement models of Facebook Intensity and Motive for using Facebook were the same as research question 1 (see Figures 13 & 14). A variety of indices of model fits were evaluated in the measurement models of the Offline Friendship and the Psychosocial Self-Esteem (see Figures 17 & 18). For the measurement model of the Offline Friendship (see Figure 17), the chi-square test of model fit was statistically significant ($\chi^2(1, N = 222) = 1.6, p > .05$), normed chi-square test statistic was 1.6, CFI was 0.99, TLI was 0.99; GFI was 0.99, and RMSEA was 0.05. All fit indices were desirable. Figure 17 shows the standardized factor loadings of the Offline Friendship measurement model. All factor loadings were satisfactory to estimate their corresponding latent variables, with factor loadings ranging from .69 to .93.
For the measurement model of the Psychosocial Self-Esteem (see Figure 18), the chi-square test of model fit was statistically significant ($\chi^2(11, N = 222) = 19.41$, $p > .05$), normed chi-square test statistic was 1.76, CFI was 0.99, TLI was 0.98, GFI was 0.97, and RMSEA was 0.06. All the fit indices indicated goodness-of-fit to the data. Figure 18 shows the standardized factor loadings of the Psychosocial Self-Esteem measurement model. All factor loadings were satisfactory to estimate their corresponding latent variables, with factor loadings ranging from .51 to .89.

![Figure 17. The fitted measurement model of offline friendship with standardized factor loadings]
Fitting the structural model of research question 3. After assessing the appropriateness of the measurement models, the hypothesized model research question 3 was estimated (see Figure 19). The chi-square test of model fit was statistically significant ($\chi^2(284, N = 222) = 458.64, p < .001$), normed chi-square test statistic was 2.66, CFI was 0.93, TLI was 0.92, GFI was 0.86, and RMSEA was 0.05. The model indicated a goodness of fit to the data, with the exception of chi-square statistic.

Following Byrne’s (2001) suggestions, the bootstrap procedure was used to validate the model fit and parameter estimation of the data with moderate sample size. The results of using model of research question 3 to fit 1000 bootstrap samples
indicated that all of the fit indices and parameter estimates with the 1000 bootstrap samples matched well those with the original sample using model of research question 3, confirming the robustness of the model fit and parameter estimation in model of research question 3. Thus, this model was used to generate the results in Figure 19.

**Could Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem, with the mediation of offline friendship?**

There was a significant path from Facebook Intensity to Offline Friendship (\(\beta = .24, p = .01\)). However, the paths from Motive for Using Facebook to Offline Friendship (\(\beta = -.01, p > .05\)) and from Offline Friendship to Psychosocial Self-Esteem (\(\beta = .02, p > .05\)) were not significant. For the purpose of presentation, my final model included the insignificant paths. The result indicated that every one standardized unit increase in Facebook intensity was associated with .24 standardized unit of increase in students’ offline friendship. Motive for using Facebook did not have any significant association with offline friendship. Moreover, offline friendship did not have any significant association with psychosocial self-esteem. In other words, Facebook intensity enhanced individuals’ offline friendship, however, motive for using Facebook did not enhance individuals’ offline friendship, and offline friendship was not a mediator between Facebook intensity, motive for using Facebook, and psychosocial self-esteem.
**Figure 18.** The fitted structural model of research question 3

**p = .01, ***p < .001**
CHAPTER 5: DISCUSSION

This chapter first summarizes findings of the study by discussing each research question. Then the limitations of this study are discussed, followed by the educational implications. Finally, the directions of future research are recommended.

Research Question 1: Were there any impacts of loneliness on Facebook intensity and motive for using Facebook?

This is one of the earliest dissertations empirically examining the relationship between first-year college students’ Facebook use and their psychological well-being using the SEM analysis method. SEM analysis indicates that Loneliness does not influence first-year college students’ Facebook Intensity and their Motive for using Facebook. The data poorly fit the first hypothesized model. Most of the fit indices were not within the satisfactory value range, indicating no major impacts of Loneliness on Facebook Intensity and Motive for using Facebook.

This result is in disparity with the claims of McKenna and her colleagues (2000, 2002) that lonely people have a propensity to use social network sites to make friends with strangers. This disagreement can be explained by the differences between using chatrooms and using Facebook. McKenna and her colleagues (2000, 2002) use lonely subjects whose motives are to find strangers on a chatroom and ultimately make new friends, while Facebook users generally deal with their acquaintances to maintain an established relationship. Lonely users found their subjects on chatrooms that provide an instant platform for lonely people to socialize with each other. Facebook gives its users power to communicate at their own available time but not
necessarily simultaneously and thus might not be the first place for lonely students to look for friends and relatives.

**Research Question 2: Were there any impacts of Facebook intensity and motive for using Facebook on loneliness?**

SEM analysis indicates that Facebook Intensity has a positive impact on Loneliness whereas Motive for using Facebook does not have any significant effect on Loneliness. Facebook users’ favorable attitude towards Facebook and more time spent on Facebook (that is, Facebook Intensity) help reduce their perceived level of loneliness.

This finding is consistent with the existing optimistic views of Internet use and loneliness (Katz & Aspden, 1997; Robinson et al., 2000). These researchers claim that more time spent on the internet as a communication tool finally augments one’s familial activities and social lives. Similarly, the more time Facebook users spend on Facebook as a communication tool increases their social networks of relatives and friends offline and reduces their loneliness.

From the perspective of Communication and Information Technology theory, social network sites are the latest computer-mediated-communication (CMC) environments that comprise two functions (Antheunis et al., 2009). First, social network sites are cue-richer applications in that they not only provide visual and auditory cues, but also audiovisual cues. Second, CMC environments vary in their openness. For example, Instant Messaging is predominantly used for dyadic, one-to-one communication, whereas social network sites encourage more open, one-to-many communication. Cue-rich and open CMC environments attract college students to use
social network sites like Facebook. Thus lonely college students have more favorable attitude towards Facebook and spend more time on it (i.e. Facebook Intensity), thus reducing their perceived level of loneliness.

On the other hand, Motive for using Facebook, referring to one’s intention of using Facebook to communicate with friends with strong ties (e.g., high school best friends) and with weak ties (e.g., friends newly known in a class) does not have a significant effect on loneliness. To explain this finding, I further examined each intention of using Facebook on the Motive for using Facebook Scale. In responding to 5 specific intentions, 87% of the first-year college students agreed that they kept contact with friends who used Facebook, and 54% of them agreed that Facebook brought all of their friends in one spot. In contrast, 72% of the students disagreed to seek further help and comfort for life problems from friends by using Facebook, 66% of them did not reveal their feelings on their profiles, and 50% of them disagreed with sharing their ups and downs with friends by using Facebook. Thus, Facebook seems to serve as a surface structure (Hartup & Stevens, 1997) platform to simply keep contact with friends, as opposed to being used to primarily develop a deep structure of friendship in which people offer one another emotional support (Hartup & Stevens, 1997). This is understandable because of the limited features of Facebook.

Yan (2006) found that people who spend more time on the Internet have significant social understanding of the Internet. People who spend more time on the Internet are more aware of online security. People who are aware of online security usually do not reveal their feelings, nor do they share their ups and downs on Facebook as it could be viewed by anybody. This was especially true when Facebook
launched its ‘News Feeds’ function on September 5, 2006 and was opposed by many users (Boyd, 2008). News Feeds, as a start page of Facebook, displays every act undertaken by their friends within the system in a reverse chronological order, for example, who befriended whom, who commented on whose Wall, who joined what group, etc. Over 700,000 people joined ‘Students Against Facebook News Feeds’ group to protest against the feature because users thought that their privacy was invaded by this feature. But the Facebook founder Mark Zuckerberg responded that News Feeds helped people keep contact with their friends as all these information were already public. Consequently, some of first-year college students’ friends are probably new and the students might feel uncomfortable revealing their true selves to these weak ties friends (Baumeister & Leary, 1995). In addition, not everyone always wants to reveal their weaknesses (e.g., missing their parents, failing a class, and having no intimate relationship, to name a few) among members of the general public they only recently befriended. Hence, one possible interpretation is that their motive for using Facebook has no significant association with Loneliness.

**Research Question 3: Could Facebook intensity and motive for using Facebook enhance individuals’ psychosocial self-esteem, with the mediation of offline friendship?**

According to the results of the structural equation modeling, there is a significant path from Facebook intensity to Offline Friendship. However, the paths from Motive for using Facebook to Offline Friendship and from Offline Friendship to Psychosocial Self-Esteem are not significant.
The present study supports a positive outcome of using Facebook as Facebook Intensity has a significant effect on Offline Friendship. First-year college students may use Facebook to keep contact with their offline friends, meeting them occasionally or not. Facebook provides a platform for students to keep contact with each other and brings all their friends in one spot, especially their mutual friends (Subrahmanyam et al., 2008). As all these activities happen in Facebook, it leads them to keep contact with their offline friends, regardless of physical distance (e.g. studying abroad, attending college far from home). Meanwhile, they can get in touch with their present school mates and other people known in a new place. Facebook can help them get acquainted with their new friends in an inexpensive way (Donath & Boyd, 2004).

Motive for using Facebook, however, varies for each user. Most of them do not agree to share their ups and downs with friends and do not seek help and comfort for life problems from friends via Facebook due to privacy and security concern (Boyd, 2008; Yan, 2006). Consequently, motive for using Facebook does not have a significant effect on Offline Friendship.

Offline Friendship, on the other hand, has little effect on Psychosocial Self-Esteem. This result contradicts the existing literature (Hartup, 1996; Reis et al., 2000). The existing literature indicates that friendship is a strong predictor of self-esteem. There are three possible explanations on this inconsistency. First, from the perspective of Erikson’s psychosocial theory (1968), first-year college students have an established identity and friendship in their adolescence, hence the level of their self-esteem is generally high. The results indicate that psychosocial self-esteem is
generally high in first-year college students. Friendship is a strong predictor of self-esteem in young adolescence (Hartup, 1996) but might not be a good predictor of self-esteem in late adolescence or young adulthood. Second, first-year college students are still establishing new friendships in college. These friendships are not always reciprocated (Vaquera & Kao, 2008) and hence they are not strong enough to enhance students’ psychosocial self-esteem (Wissink, Dekovi, & Meijer, 2009). My data were collected at the beginning of the first semester, so first-year college students’ friendships were still emerging and developing and hence these friendships may not have been strong enough and not reciprocated to boost students’ psychosocial self-esteem. Third, first-year college students might have both new friends and old friends when they enter colleges, However, the Offline Friendship Scale used in the study does not ask students to distinguish the offline old friends and offline new friends. Hence, it might confuse the participants when students responded the Scale.

Limitations of this Study

Several limitations should be noted. First, the research instrument is a self-report questionnaire. Using self-report questions present a potential issue of response bias arising from respondent subjectivity, social desirability, and misunderstanding (Buckingham, 2004; Fowler, 2008). In future studies, more objective measures based on secondary evidence, such as analyzing students’ Facebook profiles, may be included as complementary information.

Secondly, generalizability of the findings is another limitation in the present study. Due to time constraints and research interest in a particular group (first-year
college students), sampling procedures involve convenience samples rather than randomized, representative samples of the population of university students. Participants were selected based on the consent of the instructors. As such, the results and conclusions are limited to the samples that participated in the study and may not represent the first-year college student population. Generalization of the current study’s findings is, however, supported by the extremely high rate of return within classes.

Thirdly, this empirical study does not provide indisputable evidence of causation. The study did not use experimental design, quasi-experimental design, or randomized experiments (Shadish, Cook, & Campbell, 2002) to generalize causal inference. Moreover, the causality of SEM method has to satisfy three conditions: isolation, association, and direction of causation (Bollen, 1989). Thus it was neither my original intention nor my actual findings to suggest strong causation.

**Educational Implications**

This study is one of the earliest dissertations focusing on the association of the use of social network sites and their psychological well-being among college students. The study is based on a strong theoretical context of psychological science and communication science, and examines several theoretical models that are supported by the survey’s data. Hence, there are two major educational implications; (1) educational policy makers can provide a guideline of using social network sites for universities; (2) educators and school administrative staff can provide students with academic and emotional support after class by using social networking sites.
First, one of the findings of the study indicates that students who used Facebook reduce their loneliness and increase their offline friendships. Based on this finding, education policy makers can implement a guideline of using social network sites for their own universities. For example, universities will provide professional development to their administrative staff, faculty, and students about how to use social network sites creatively, effectively, and safely as an advantageous tool to improve students’ offline friendship.

Second, educators and school administrative staff can provide students with academic and emotional support after class by using social network sites. For example, under new education policy guidelines, teachers can recruit students from different classes to form a study group or an interest group like the Structural Equation Modeling Study Group and the Monthly Story Sharing Group in a social network site. Teachers can upload some humorous cartoons in their profiles that can reduce students’ stress and anxiety levels (McMorris, Boothroyd, & Pietrangelo, 1997). Through sharing common interest students can know each other better and engage in expanded social networks with their friends. School counselors can also establish a Companion Group in Facebook or Myspace and invite students to participate. This will be a strong attraction to students with loneliness since this group of students tends to use online communication rather than face-to-face communication. By reading students’ Facebook pages and looking at their networking friends, habits, and groups, counselors can develop in-depth understanding of students’ psychosocial needs and provide specific one-to-one service to their student clients. Counselors can also advise students how to use their
online profile safely and wisely. Additionally, Pempek and her colleagues (2009) suggest that the popularity of social networking applications could make them a powerful cognitive tool if adapted for academic pursuits and career goals. In conjunction with their findings, this study supports using social network sites as an effective way to reduce college students’ loneliness and enhance their offline friendship.

**Directions for Future Research**

First, a researcher could recruit university students rather than the first-year college students as a sample. Not only first-year college students suffer loneliness, but different age groups as well (Russell, 1996). In order to generalize the present findings to the university student population, future research should focus on the whole university students in general, so that research findings will be more useful for education policy makers.

Second, mixed methods integrating qualitative and quantitative research methods and longitudinal research methods can be adopted. Qualitative methods can provide more insights on why and how individuals use social networking and quantitative methods can capture individuals’ psychological well-being and their association with social networking quantitatively. Meanwhile, longitudinal research can examine the impacts of social networking on individuals’ long-term psychological well-being.

Third, future studies should consider how demographic factors (e.g., gender, ethnicity, and age) relate to students’ loneliness, Facebook intensity and psychosocial self-esteem. For example, it would be interesting to see whether a specific
demographic factor predetermines students’ Facebook use and their psychological well-being.

In summary, the present study supports the impact of Internet use on loneliness but does not support loneliness’ influence on Internet use due to specific features of Facebook. Therefore, Facebook intensity can reasonably be a predictor of individuals’ loneliness and offline friendship. Facebook intensity is negatively associated with loneliness and positively related to offline friendship. Motive for using Facebook has a significant effect on neither loneliness nor offline friendship. Further studies need to include other years of college students to generalize these results to the college student population rather than just first-year college students.
References


Psychological Association.


http://www.newscientist.com/channel/tech/mg19125691.700-living-online-the-end-of-privacy.html


http://jcmc.indiana.edu/vol12/issue4/valkenburg.html


Appendix A: A brief introduction to Facebook

From Invention to Present

Facebook was the fastest growing social network site among all, jumping 270 percent to 52.2 millions visitors from June 2006 to June 2007 (comScore, 2007). Mark Zuckerberg, a computer-savvy Harvard sophomore, started a site called thefacebook.com in February 2004 (Levy, 2007). The name referred to the yearbook-style booklets of photos and vital statistics that incoming freshmen received at Harvard. Zuckerberg’s site was an instant success. Within two weeks after its release, The Harvard Crimson reported the site had already attracted 4,300 students, faculty and alumni. Soon, students at other schools were clamoring for their own versions of the site, and by the end of March it was at Stanford, Columbia, and Yale, on its way to capturing the entire college market. Students even used its messaging function instead of e-mail.

That spring Zuckerberg quit school, and he and his partners moved to Silicon Valley, where they met with their investor (Levy, 2007). Later Facebook received $12.7 million in venture-capital money. Facebook began its march beyond colleges, adding high schools in 2005 (no one under 13 is permitted to register) and then corporations in early 2006. By September 2006, anyone could register, and memberships started climbing.

Another important feature added to Facebook was to fill it with all sorts of applications people could use without leaving the site (Levy, 2007). Thousands of developers, from big companies to kids in dorm rooms, instantly began creating applications that backed up Facebook’s infrastructure. The new applications could get
instant viral distribution, since News Feed blasted a report to friends every time someone installed a new application. It was a free promotion. Developers could make money from Facebook-embedded applications by taking ads or selling things without sharing a cent of the proceeds with Facebook. For example, a 22-year-old college student stayed up all night to hack a free version of Facebook’s $1 graphic gifts, and five million people downloaded his application.

Why did Facebook do this and what did it get from those applications? According to Zuckerberg, he wanted to keep the user – student, graduate, or adult – logged on to Facebook, organizing virtually everything via the social graph. If all went well, much of what people did on the Internet would be accomplished within Facebook (Levy, 2007).

Zuckerberg believed that this was what made Facebook so compelling: more and more friends joined Facebook, and could communicate with each other via Internet and expanded connections within Facebook (Levy, 2007). Unlike MySpace, Facebook was not intended as a venue to seek out new people, though certainly it was possible to locate promising strangers whose relationship status was “anything I can get.” The Facebook experience was built around people one knew, and the center of the page was a News Feed where the stories largely consisted of the activities, brief status reports, photo and video postings, and comments from those one had marked as friends. Lashingsky (2005) estimated that there were approximately 8 million students from over 2,000 colleges and 22,000 high schools using Facebook to post personal information such as pictures, hobbies, and messages to communicate with fellow students and instructors as well as friends and family.
A college student loved using Facebook for the following reasons (Levy, 2007);

“Facebook is my personal assistant, allowing me to catch up on my social life without telephone tag, awkward lunches and five-, 10-, 15-year reunions. We write on each other’s Wall, a message board, when we want to say happy birthday without singing into an answering machine. When I’m having a hectic week at my internship, I can change my status so that people know why I haven’t returned their telephone calls—much better than wasting time calling people to tell them you’re too busy to talk (p.44).”

Special Features (as of January 25, 2008)

Facebook’s profile was called a ‘wall’, where people could see one’s full profile. Users could leave messages to their friends’ wall, which could be seen by everyone. More private discourse was saved for messages and was sent to one’s inbox, which could be seen by the sender and recipient of the message, like an email.

Facebook had a poke feature, which was intended to attract the attention of the other user. Facebook events were like MySpace’s bulletin board, which was used to notify friends about upcoming events in their community and to organize social gatherings.

In February 2007, Facebook added a new gift feature. Each user was given one free gift to give upon account signup. Each additional gift cost the sender USD$1.00. The sender could send a small icon (a gift) to his/her friend’s gift box. The small icon would be marked by the first name of the sender or ‘private’, depending upon the sender’s wish to make it public or private.

Facebook updated its new hug feature in early 2008. Users could send any hug picture to their friends freely. FunWall was run by slide.com, as advertised in Facebook.com. Users could send video, photo, graffiti, and greeting cards to their friends without any cost. For example, before Valentine’s day, there were several
Valentine’s cards to be selected from the FunWall function. Users could choose any greeting cards to send to their friends.

Procedures of Registering Facebook (as of February 1, 2008)

Many of the social network sites were free to register and so was Facebook. The registration of Facebook was easy and simple and could be done at http://www.facebook.com. The green button of “sign up” on the right hand side was linked to a form which was needed to complete. Information about “Full name”, “I am” (in college, at a company, in high school, or none of above), “Date of birth”, “Email”, and “Password” was required for registration. After typing the security verification codes, checking the checkbox of user agreement, and clicking the “sign up” button, the user created his/her own account. The email address and password were used to log in the account. After registering the Facebook, the users could upload picture in their profiles, search for friends by using “Use the Friend Finder” feature, join a new group, and network with friends in other networks, to name a few, depending upon their interests and favorite. Whenever friends had sent a private message to the user, left a message on the wall, or left a message on the Fun wall, the user would be notified by an email. Likewise, whenever the user had sent a private message or left comments on his/her friend’s wall or Fun wall, he/she would receive a notified email.
Appendix B: College Student Facebook Use Questionnaire

Part I

Age: ___18 ___19 ___20 ___21 ____22 or above
Gender: ___Female ______Male
Education level: ___Freshman ___Sophomore ___Junior ___Senior
____Nonmatriculate ___Graduate
Ethnicity: ____African American ____Asian ____Caucasian ____Hispanic

In the past six months, on average, how many hours did you use the Internet per day?
______hours

In the past six months, on average, how did you use the following on the Internet and how much time did you use to communicate with your friends daily?

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<tr>
<th>Type of Internet use</th>
<th>Yes (check if you use)</th>
<th>Hours/minutes used</th>
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<tbody>
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<td>Blogging</td>
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<td>Chatroom</td>
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<td>Email</td>
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<td>Instant messaging</td>
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<td>listserv</td>
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<td>MySpace</td>
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<td>Other social networking site (Please specify:________)</td>
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Do you use Facebook? ____Yes  ____No

Part II

The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described by circling the number. 1 is strongly disagree and 7 is strongly agree.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>Disagree</th>
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<tbody>
<tr>
<td>Agree</td>
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</table>

1. Do you always feel that you are “in tune” with the people around you? 1 2 3 4 5 6 7
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<tr>
<th>Question</th>
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<td>2. Do you always feel that you lack companionship?</td>
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<td>3. Do you always feel that there is no one you can turn to?</td>
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<td>4. Do you always feel alone?</td>
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<td>5. Do you always feel part of a group of friends?</td>
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<td>6. Do you always feel that you have a lot in common with the people around you?</td>
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<td>7. Do you always feel that you are no longer close to anyone?</td>
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<td>8. Do you always feel that your interests and ideas are not shared by those around you?</td>
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<td>9. Do you always feel outgoing and friendly?</td>
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<td>10. Do you always feel close to people?</td>
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<td>11. Do you always feel left out?</td>
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<td>12. Do you always feel that your relationships with others are not meaningful?</td>
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<td>13. Do you always feel that no one really knows you well?</td>
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<td>14. Do you always feel isolated from others?</td>
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<td>15. Do you always feel that you can find companionship when you want it?</td>
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<td>16. Do you always feel that there are people who really understand you?</td>
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<td>17. Do you always feel shy?</td>
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<td>18. Do you always feel that people are around you but not with you?</td>
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<td>19. Do you always feel that there are people you can talk to?</td>
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<td>20. Do you always feel that there are people you can turn to?</td>
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Part III

The following section describes how people feel about themselves. Please circle the following statements which best suit you.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>1. I feel that I’m a person of worth, at least on an equal plane with others.</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>2. I feel that I have a number of good qualities.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>3. All in all, I am inclined to feel that I am a failure.</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>4. I am able to do things as well as most other people.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>5. I feel I do not have much to be proud of.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>6. I take a positive attitude toward myself.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>7. On the whole, I am satisfied with myself.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

Part IV (Please do not fill in this part if you don’t use Facebook)

The following statements ask your opinions about using Facebook. Please circle the answer that best suits you. For items 3 to 7 below, 1 indicates strongly disagree and 7 is strongly agree.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How many Facebook friends do you have?</td>
<td>____________</td>
</tr>
<tr>
<td>2. In the past week, on average, how many minutes per day did you spend on Facebook?</td>
<td>_______ minutes/day</td>
</tr>
<tr>
<td>3. Facebook has become part of my daily activity.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>4. I feel uncomfortable when I haven’t logged onto Facebook for a while.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>5. I feel I belong to part of the Facebook community.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>6. I like to communicate with my friends via Facebook.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>7. Facebook is one of the main communication tools for me and my friends.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>
Part V (Please do not fill in this part if you don’t use Facebook)

Please circle the response which best suits you.

I use Facebook because I want to….

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. keep contact with friends who use Facebook.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>2. share my ups and downs with friends.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>3. reveal my feelings on my profile.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>4. express my interests and hobbies on my profile.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>5. seek help and comfort for life problems from friends.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>6. meet new friends with similar interests.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>7. bring all the friends to one spot.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>8. share my friends’ ups and downs.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

Part VI (Please do not fill in this part if you don’t use Facebook)

This section asks how often you hang out with your friends. Please think about one or some of your good friends on your Facebook. Then answer the following questions.

1=never  2=once per year  3=several times per year  4=once per month  5=once per week  6=several times per week  7=daily

<table>
<thead>
<tr>
<th>Question</th>
<th>1 2 3 4 5 6 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often do you meet one or more of these friends offline?</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>2. How often do you and these friends go somewhere and do things together?</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>3. How often do you hang out and have fun with one or more of these friends?</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>4. How often do you contact one or more these friends via telephone?</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>
Appendix C: Recruitment script

Dear students:

You are asked to participate in a research study that has been approved by an Institutional Review Board. The purpose of the study is to examine college students’ Internet use, especially Facebook usage.

You should know that participation in research is entirely voluntary. Even after you agree to participate in the research, you may decide to leave the study at any time without penalty or loss of benefits to which you may otherwise have been entitled.

All information obtained in this study is strictly confidential unless disclosure is required by law. In addition, the Institutional Review Board and University or government officials responsible for monitoring this study may inspect these records.

If at any time you have questions regarding this research or your participation in it, you should contact the investigator Lai-Lei Lou (siulou@gmail.com) at 281-506-2036, or faculty advisor Dr. Zheng Yan (zyan@uamail.albany.edu) at 518-442-5060 who will answer your questions.

If you have any questions concerning your rights as a research participant that have not been answered by the investigator or if you wish to report any concerns about the study, you may contact the Office of Research Compliance at 518-437-4569 or orc@uamail.albany.edu.

You will be given a copy of this consent form to keep. Thank you very much for your participation.