EXPLORING CRITICAL FACTORS IN PREDICTING POST-ADOPTIVE USE OF FACEBOOK

Michael J. Magro, B.S., M.S.

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

May 2011

APPROVED:

Sherry Ryan, Major Professor
Victor Prybutok, Major Professor
Anna Sidorova, Committee Member
Yu "Andy" Wu, Committee Member
Audhesh Paswan, Committee Member
Finley Graves, Dean of the College of Business
James D. Meernik, Acting Dean of the
Toulouse Graduate School

Magro, Michael J. Exploring Critical Factors in Predicting Post-Adoptive Use of Facebook. Doctor of Philosophy (Business Computer Information Systems), May 2011, 95 pp., 18 tables, 15 figures, references, 149 titles.

Social networking applications (SNAs) have experienced a boom in popularity in recent years. Sites like Facebook and MySpace continuously draw new users, and are successful in organizing groups of users around topics of common interest. Among SNAs, Facebook has demonstrably outgrown its rivals growing an estimated 157% from 2008 to 2009. Facebook is now estimated to be the fourth largest Internet site in the world, trailing only Google, Microsoft and Yahoo (Schonfeld 2009).

This dissertation posits and tests a theoretical model composed of key factors that contribute to post-adoptive use of social networking applications and the relationship of those factors to one another. This study also identifies and clarifies new constructs that were not previously used to measure usage, and further refines the constructs that were previously used so that they better fit social networking applications.

The results of this dissertation show that the critical factors of social capital, hedonic enjoyment, perceived usefulness, social influence, satisfaction and attitude have a positive influence on a post-adoptive user's intention to continue using Facebook. The results of this study yielded a structural model for predicting the post-adoptive use of Facebook. This work also developed an instrument for measuring constructs relevant to social networking applications.

ACKNOWLEDGEMENTS

First and foremost I want to thank my wife Karen, without whose unwavering support I would not have started this program, and without whose superhuman effort to keep everything else in our lives together I would not have finished. I also want to thank my two boys, Cade and Drew, for constantly reminding me there is more to life than academia.

I especially thank my dissertation chair Sherry Ryan for her guidance and generosity to me and my family while I labored through the program and my dissertation. She gave me more of her time than I deserved, and continues to do so.

I also especially thank my dissertation co-chair Victor Prybutok for his creative and relentless support of my publishing activity. Victor is the best example of an engaged faculty member that I know of.

I thank my committee members, Anna Sidorova, Andy Wu, and Audhesh Paswan. Each contributed significantly to the final form of my dissertation, and all were fun to work with.

I thank Tom McGinnis, my colleague in the Ph.D. program, who had to serve as my sounding board, conference companion, fellow sorrow-drowner, and co-author. He made the tough parts of the program tolerable, and the pleasant parts of the program more enjoyable.

Last, but certainly not least, I thank my mother and father for encouraging me to pursue my dreams all my life.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

Background

Social networking applications (SNAs) have experienced a boom in popularity in recent years. Sites like Facebook and MySpace continuously draw new users, and have been successful in organizing groups of users around topics of common interest. Recent data suggests that 65% of U.S. teens use a social networking application, and up to 35% of Internet users age 55 and older make use of SNAs (Lenhart 2009). In 2008, nine SNAs reported registered users of over 50 million each (Cardon 2008). Four of those nine are estimated to have received over 100 million unique visitors, and two of the nine reported over 200 million unique visitors (Schonfeld 2008). While current usage is significant, it is estimated that the percentage of Internet users age 55 or older with a profile on an online social network has quadrupled from 2005 to 2008 (Lenhart 2009). Facebook experienced a 116% increase in unique visitors from September 2007 through November 2008, and Blogger.com experienced a 44% increase over the same period of time to reach an estimated 222 million unique visitors (Schonfeld 2008). SNAs are an important technological phenomenon both because of their high current usage and their trend of usage growth.

Among SNAs, Facebook has demonstrably outgrown its rivals growing an estimated 157% from 2008 to 2009. As of August 2009 it is estimated that Facebook has generated 340 million unique visitors worldwide, and claims 250 million active registered users (Schonfeld 2009). Facebook has grown so large that it is now estimated to be the fourth largest Internet site in the world, trailing only Google, Microsoft and Yahoo (Schonfeld 2009). The widespread use of Facebook makes it a good choice for research on social networking applications. In a pilot

study prior to this dissertation, Facebook was the overwhelming choice for SNA use by the users surveyed.

Research Objectives

The question of why individuals use social networking applications has not yet been answered. The answer to this question affects many things. From a practitioner perspective, it affects how businesses should approach leveraging SNAs to relate to their customers, whether or not a firm's offerings are suited for involvement in a SNA, and how SNA design can be improved upon. Industry advisors assert that successful corporate entry into the online social networking community is not as simple as establishing a profile on a SNA and waiting for users to flock to the company's online presence (Warr 2008). Some companies have been successful utilizing SNAs, and some are still waiting for success. Addressing SNA usage in a satisfactory way will benefit both businesses and customers through knowledge that contributes to productive online communities that meet the needs of both entities. From an academic perspective, researchers will benefit from knowledge of what specific aspects of SNAs contribute most to continued use, and access to an established instrument for measuring post-adoptive SNA use.

Technology adoption studies have traditionally examined user acceptance of a technology through theoretical variations of the technology acceptance model (Davis, 1986), employing measures of usefulness, ease of use, satisfaction, and other measures thought to be relevant influences on the use of the technology, and comparing user responses with self-reported or statically measured system use. Oftentimes this occurs with a new technology, and users are studied either at the beginning of the technology's introduction (Davis 1989; Davis & Venkatesh 2004, etc.), after a short introduction or brief period of training (Venkatesh & Davis 2000), or after having used the technology for an undetermined period of time (van der Heijden 2004), or

even a combination of all three (Venkatesh, Morris, Davis & Davis 2003). In this dissertation, the technology being studied is not new to the study population, and the respondents were limited to only those who can be considered to have adopted the technology. In other words, the respondents studied all had experience with the technology and had passed beyond a typical period of introductory use. The most distinctive difference between post-adoptive and pre-adoptive use in a technology acceptance/adoption study is that a pre-adoptive user may use the technology for a period of time and then choose not to adopt the technology (assuming it is not mandated by authority or the only means of achieving an end). Therefore, in the absence of a longitudinal study that tracks a users' decision to adopt over time, study investigators may not be able to distinguish between influential factors that promote short-term use and those that result in long-term adoption. In this manner this study differentiates itself from many technology acceptance studies through the choice of post-adoptive system use as its dependent variable rather than pre-adoptive or other unclassified measures of system use. More details regarding the measure of post-adoptive use are given later.

In summary, the research objectives are as follows:

1. To examine past and present research into technology adoption, post-adoptive use, and SNA technology, and determine a set of key constructs applicable to the measurement of post-adoptive SNA use
2. To develop and test a theoretical model that is effective in predicting the post-adoptive use of SNA technology
3. To establish an instrument of measurement that is effective for constructs pertaining to SNA use

Purpose and Contribution

This study attempts to develop and test a theoretical model representing key factors that contribute to post-adoptive use of social networking applications and the relationship of those factors to one another. This study also attempts to identify and clarify new constructs that have not been used to measure usage before, as well as refine constructs used in previous studies to better fit social networking applications.

This dissertation contributes to academic research in the following ways: (1) It reviews previous literature on the adoption and post-adoptive usage of technology and theorizes its application to a new context: the realm of social networking computing applications;(2) it develops and empirically tests a theoretically grounded model that can be used and extended in future research on social networking, online communities, and social software; (3) it defines new constructs (included in the model) that affect SNAs and that may prove valuable for further research on social media; (4) it introduces an validated instrument for measurement of SNA usage factors to the field.

This dissertation contributes to industry practice in the following ways: (1) It provides a model which is a first step toward understanding the relationships between the factors that influence post-adoptive usage of SNAs, which may be important for organizations who are pursuing commercial utilization of online social networking with their customers and within their organization; (2) it identifies and provides an assessment of critical factors affecting post-adoptive usage of SNAs that will be valuable for those designing or configuring SNAs.

Theoretical Basis

This study employs a broad theoretical lens encompassing both post-adoption models, and technology acceptance models such as TAM, its predecessors such as TRA and the theory of

planned behavior (TPB), and subsequent models such as the unified theory of acceptance and usage of technology (UTAUT). Each research stream is examined for its relevance and applicability to the post-adoptive usage of social networking computing applications. In addition, literature on SNA usage has suggested the presence of social capital as a concept related to usage. Therefore some aspects of social capital theory are incorporated to improve the explanatory power of the model.

The phrase *post-adoptive use* in this study simply refers to continued active use of the technology beyond the point where the technology was first adopted. This research is not a post-adoption study where changes in usage patterns are examined from a baseline taken at adoption. The goal in looking at post-adoptive use is to overcome the situation of individuals adopting a technology based on their perceptions of it, then abandoning it because the perception of the benefits were different than the reality of their experiences. Individuals that continuously and actively use SNAs after initial adoption are the targets of this research, and the goal is to identify the critical factors that affect their decision to continue to use SNAs as well as the relationships among those factors.

A study about post-adoptive use of technology must address in some manner the initial adoption of technology, because the road to post-adoption passes through adoption. Technology users cannot adopt a technology if they are unwilling to use it for any length of time. Information systems literature on technology adoption is centered around the technology acceptance model (TAM) by Davis (1989). The TAM model posits that a technology's perceived usefulness and perceived ease of use affect the user's intention to use the technology, which in turn results in a degree of usage. TAM in turn was adopted from the theory of reasoned action (TRA) which theorized that the user's attitude toward an action and the social influences

on the user regarding the action contributed toward the user's intention to perform that action. Over time extensions and modifications of both theories have emerged, introducing new constructs such as behavioral control, technology performance, and system output. The amount of extensions and variations of TAM have prompted a few recent articles on the state of usage research with at least one call to step back and examine the process of adoption research to ensure the progress reported is not simply illusionary (Benbasat and Barki 2007). The constructs used to measure key factors in acceptance/adoption studies can often be found in post-adoption studies as well. This is understandable, since technology acceptance models have been shown to have some predictive power of continue usage (Bhattacherjee 2001).

Research Design

The primary data collection method was through the use of a quantitative survey of users of Facebook. To help clarify new constructs and relationships, focus groups were held in which users of Facebook were asked questions and encouraged to speak freely and interact with each other about various aspects of Facebook usage. The results of the input from the focus groups did not affect theorized relationships, but did help the investigator's understanding of construct relevance and the user's perception of Facebook use. Additionally, a pilot study was performed prior to the focus groups to test the formation of constructs from existing literature and also to test validity and reliability. Survey data from the primary survey was analyzed using structural equation modeling.

Organization of this Dissertation

The subsequent sections of this dissertation are organized as follows: Chapter 2 is a review of the relevant literature pertaining to online social networking, online communities, and the theories and constructs used in this study. Chapter 3 contains a discussion and defense of the

research methods utilized for this study, and outlines the methods of conduct for the data collection.

CHAPTER 2

LITERATURE REVIEW

Research Questions

Formally stated, the primary research question this study seeks to answer is "what critical factors are effective in predicting post-adoptive use of Facebook?"

The answer to this question begins with a review of literature. The organization of this section is as follows: Social networking applications are defined and the relevant extant literature presented. Particular attention is paid to Facebook since it is the primary SNA used in this study. Next, applicable literature about adoption and acceptance of technology is presented and discussed. Following that is a review of the extant user acceptance models from literature and their fitness to measure the SNA phenomenon. Next, literature on the key usage construct is reviewed and discussed, and finally literature regarding the definition and understanding of social capital and how it relates to the use of social networking applications is presented and discussed.

Social Networking Applications

The term "social network" usually refers to a social structure consisting of interconnected nodes of individuals or groups of individuals drawn together by relational ties. The fundamental concepts of social networks have been undergoing scientific examination since the mid-19th century (Freeman 2004). In the Internet-powered age of the present, social networks play a significant part in the lives of individuals through the trend of social networking applications.

SNAs have been referred to by various names, such as social networking sites (Enders, Hungenberg, Denker and Mauch 2008, Dwyer, Hiltz and Passerini 2007), social networking websites (Agarwal and Mital 2009, Hargittai 2008), social networking applications (Lucas and

Borisov 2008, DiMicco and Millen 2007), and other variations of these common component terms.

While there have been individual efforts to define specific groups of terms (boyd and Ellison 2008), a consensus has not emerged. This research utilizes the term social networking computing application, or social networking application (SNA) for convenience. The term SNA is less platform-specific and more inclusive of mobile devices and other potential means of accessing social networking computing offerings.

In this dissertation, SNA is defined as a computing application that supports and encourages online social networking. Users of SNAs participate in a kind of online community that simulates, after a fashion, the offline social interactions of individuals. SNAs are usually accessed through a web browser from a website, although they can also be accessed through mobile phones or other electronic means. SNAs typically share a common set of features which include:

> a profile (representation and/or description) for each user, the means to build and manage a personal relational network (i.e., friends, family, acquaintances, etc.), and access to creative methods to communicate with members of their relational network and the online community (Magro, Ryan, Sharp and Ryan 2008).

Facebook, the SNA studied in this dissertation, is the most popular SNA in the world at this time based on unique visitors (340 million) and registered members (250 million) (Schonfeld 2009). Facebook offers all of the most common features expected in a SNA . It is also easily integrated with other services such as Twitter, and has been moving steadily toward integration on a larger scale with application and website developers (Morin 2008). Much of the literature on SNAs to this point has involved Facebook.

Academic literature on SNAs has begun to proliferate over the last few years but there is still a limited amount of knowledge on the phenomenon. An analysis of the available academic

literature on SNAs for the last six years reveals a collection of five themes or areas of interest that are representative of the kinds of research being conducted on SNAs. The five themes are:

- Privacy, trust, security, & ethics
- Use and motivations for use
- SNA suitability as tools for a discipline, field of study, or division of industry
- SNAs as artifacts; design, improvement, assessment
- General analysis of the SNA phenomenon (including history, growth, classification, and general user behavior)

Additionally a sixth category exists and consists of a growing collection of individual case studies that look at a specific SNA or a specific user group for a purpose other than that listed above, and key articles from each of these themes are listed in Table 1.

Table 1. Themes of Research in SNA Literature

Theme	Description	Examples
PRIVACY/TRUST	Privacy, trust, security, or ethics	Dwyer et al. 2007; Fogel and Nehmad 2009; Hinduja and Patchin 2008; Acquisti and Gross 2006.
USE	Use and motivations for usage	Bolar 2009; Bruque, Moyano and Eisenberg 2008; Ellison, Steinfield and Lampe 2007; Hargittai 2008; Ross, Orr, Sisic, Arseneault, Simmering, and Orr 2009.
TOOL	Suitability as a tool for use by a discipline, field of study, or division of industry	Bailey and Zanders 2008; Baker-Eveleth, Eveleth and Sarker 2005; Connell 2009; Pasfield-Neofitou 2008; Lockyer and Patterson 2008.
ARTIFACT	Analysis of the design, improvement, or assessment of SNAs as artifacts	Bouman, Hoogenboom, Jansen, Schoondorp, de Bruin and Huizing 2007.
GENERAL	General Analysis of the SNA Phenomenon (including history, growth, classification, and general user behavior)	boyd and Ellison 2007; Brown, Broderick and Lee 2007; Snyder, Carpenter and Slauson 2007; Thelwall 2008A; Richter and Koch 2008; Beer 2008.
CASE STUDIES	Individual case studies looking at a specific SNA or user group for a purpose other than the above themes	DeKay 2009; Hogg, Wilkinson, Szabo and Brzozowski 2008; Lange 2008; Mislove, Koppula, Gummadi, Druschel and Bhattacharjee 2008; Tan 2008; Thelwall 2009; Walther, Van Der Heide, Hamel and Shulman 2009; Williams and Merten 2008; Zhao, Grasmuck and Martin 2008.

Of the six categories of SNA literature given above, the research question suggests that primary attention be focused on SNA studies which examine use and motivations for usage. To that end, the literature on SNA usage was analyzed and found to fall into the following three groups: Motivations (reasons for use), Activities (what people use SNAs for), and Associations (factors associated with use or adoption which are not necessarily motivational). Examples of articles in each category are shown in Table 2.

Table 2. Categories of Usage Studies in SNA Literature

Category	Description	Examples
MOTIVATION	Reasons individuals use SNAs	Agarwal and Mital 2009 Arthur, Sherman, Appel and Moore 2006 Bolar 2009 Bumgarner 2007 DiMicco, Millen, Geyer, Dugan, Brownholtz and Muller 2008 Dwyer, Hiltz and Widmeyer 2008* Lampe, Ellison and Steinfield 2008a Pempek, Yermolayeva and Calvert 2009 Subrahmanyam, Reich, Waechter and Espinoza 2008*
ACTIVITIES	What people use SNAs to do	Dwyer, Hiltz and Widmeyer 2008* Ellison 2007 Ellison, Steinfield and Lampe 2006 Ellison, Steinfield and Lampe 2007 Subrahmanyam, Reich, Waechter and Espinoza 2008*
ASSOCIATIONS	Factors associated with the use or adoption of SNAs that don't fit the above two categories	Hargittai 2008 Pfeil, Arjan and Zaphiris 2008 Ross, Orr, Sisic, Arseneault, Simmering and Orr 2009

* Article fits in two categories

The extant literature on SNA usage provides examples of multiple approaches and methods used by various researchers to try to answer questions about how and why people use SNAs. The literature on motivations for using SNAs discusses factors including hedonic pleasure, self-presentation, social connection, utility, and peer-pressure (Bumgarner 2007), career advancement, project support (DiMicco, Millen, Geyer, Dugan, Brownholts and Muller 2008), relationship maintenance, new relationship discovery (Dwyer, Hiltz and Widmeyer 2008), to strengthen weak ties in existing relationships (Lampe, Ellison and Steinfield 2008), rich communication, and engaging in interesting activities (Pempek, Yermolayeva and Calvert 2009).

The literature on activities describes many granular activities people use SNAs to do including resurrecting past relationships (Ellison 2007) and engaging in activities that generate social capital (Elllison, Steinfield and Lampe 2006, 2007). There is also a stream of literature on associations that suggests association between the use of SNAs and factors not directly thought to be motivating, such as gender, race, ethnicity, parental education, experience, autonomy (Hargittai 2008), age (Pfeil, Arjan and Zaphiris 2008), and personality (Ross, Orr, Sisic, Arseneault, Simmering and Orr 2009).

Post-Adoptive Use

As mentioned previously, the phrase *post-adoptive use* in this study refers to continued active use of the technology beyond the point where the technology was first adopted; adoption in this case referring to the point after the technology has been introduced, has been made accessible to the user, and has been applied by the user in accomplishing his/her desired activities. This definition is consistent with the concept of post-adoptive usage behavior used in contemporary information technology studies (Hsieh & Zmud 2006, Kim et al. 2005, Ahuja & Thatcher 2005, Jasperson et al. 2005)

While no post-adoptive studies have been published on SNA usage to date, post-adoptive literature in information systems is an emerging research stream. Recent publications have advocated further and more focused research on this phenomena (Kim et al. 2005), and have encouraged organizations to capture relevant post-adoption data (Jasperson et al. 2005) in order to further the field knowledge in this area.

An examination of published studies on post-adoptive use of information technology reveals several different research interests. There are many studies on post-adoptive user behavior (Hseih & Zmud 2006, Jasperson et al. 2005, Kim et al. 2005, Karahanna et al. 1999,

Bhattacherjee & Premkumar 2004, Kim & Son 2009), where the focus is on categorizing and examining specific actions, behaviors, or perspectives users develop after initial technology adoption. There are also studies that attempt to predict or model continued usage beyond adoption (Wang et al. 2009, Bhattacherjee 2001, Saeed & Abdinnour-Helm 2008), such as Bhattacherjee's (2001) use of expectation confirmation theory (and *perceived usefulness* from technology acceptance literature) to model continued usage (Figure 1). Finally, there are studies examining specific aspects of post-adoptive use (besides user behavior) that make them difficult to group together (Ahuja & Thatcher 2005, Mangalaraj et al. 2009, Al-Natour & Benbasat 2009). A table summarizing post-adoptive literature appears below (Table 3).

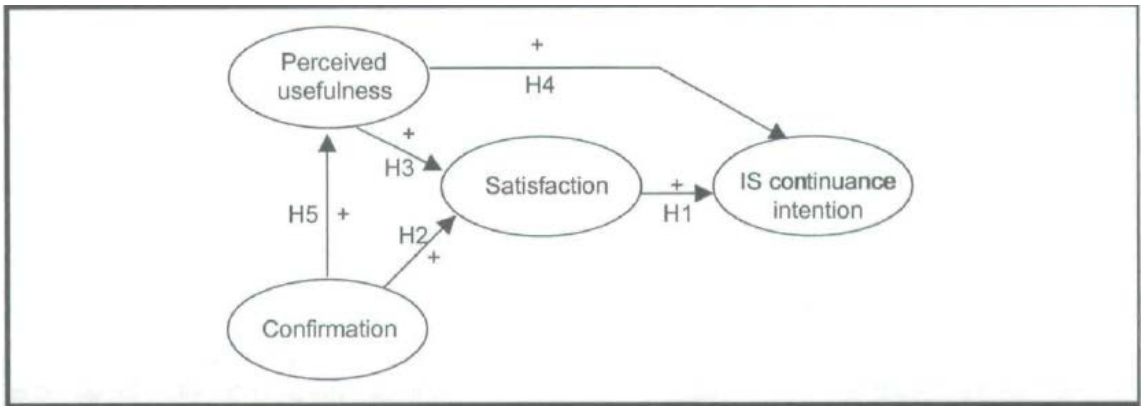

Figure 1. Expectation confirmation model (Bhattacherjee 2001).

Table 3. Categories of Post-Adoption Usage Studies in SNA Literature

Category	Description	Examples
USER BEHAVIOR	Categorizing and examining specific actions, behaviors, or perspectives users develop after initial technology adoption	Hseih & Zmud 2006 Jasperson et al. 2005 Kim et al. 2005 Karahanna et al. 1999 Bhattacherjee & Premkumar 2004 Kim & Son 2009
PREDICTION & MODELING	Studies that attempt to predict or model continued usage beyond adoption	Wang et al. 2009 Bhattacherjee 2001 Saeed & Abdinnour-Helm 2008
MISCELLANEOUS	Studies examining specific aspects of post-adoptive use (besides user behavior) that make them difficult to group together	Ahuja & Thatcher 2005 Mangalaraj et al 2009 Al-Natour & Benbasat 2009

Predicting post-adoptive use differs from predicting initial or pre-adoptive use. During the pre-adoptive stage, users likely engage in active cognitive processing in the determination of adoption and continued use (Jasperson et al. 2005). This cognitive processing includes the user's evaluation and experiential assessment of the various technology acceptance constructs, and the user's reaction to factors such as organizational mandates or pressures to use. Once the decision has been made to adopt and continue to use the technology, system use becomes more familiar and task behavior is repeated (Leonard-Barton & Deschamps 1988). Repetitive behavior is expected to result in reduced cognitive processing over time leading to utilization by habit and routine (Logan 1989, Ouellette and Wood 1998). The various facets of system usage after adoption may be different for the same user than the system usage before adoption, as that user becomes more familiar with the technology and learns how to best use the technology to suit their goals (Cooper & Zmud 1990; Goodhue & Thompson 1995; Kwon & Zmud 1987). Therefore, while the specific measures of system use need not be different between pre-adoption and post-adoption, there is reason to assume that post-adoptive measures might change for the same user over the time period spanning pre-adoption and passing through post-adoption.

Bhattacherjee's (2001) examination of the post-adoptive use of an online banking application using a combination of expectation confirmation theory and perceived usefulness from technology acceptance literature, and resulted in a model shown to predict user's intention to continue using an information system.

The model proposed by Bhattacherjee used confirmation of user's expectations and perceived usefulness as predictors of user satisfaction, but only 33% of the satisfaction variance was explained. Therefore, it is reasonable to assume there are additional salient predictors not accounted for in that study.

In the search for other predictors, it is reasonable to consider established pre-adoptive models, since technology acceptance models have been shown to explain some variance (Bhattacherjee 2001). Many post-adoptive studies are tied to pre-adoptive studies in that they use some of the same constructs and the models can look similar (Figure 1). Therefore, an examination of pre-adoptive literature has been undertaken.

Technology Acceptance Models

In the past, information systems literature has addressed technology adoption and usage through models that measure behavioral, perceptional, and attitudinal factors. There is a rich tradition of models following that approach.

Technology acceptance models are relevant to a study on post-adoptive technology use for several reasons. First, evidence supports the consistent stability of key pre-adoption constructs (perceived usefulness, behavioral intention, etc.) through continued system use after adoption (Davis & Venkatesh 2004, Taylor & Strutton 2009). Second, empirical studies suggest that past use is the primary predictor of future use (Davis & Venkatesh 2004, Kim et al. 2005, Venkatesh et al. 2000). Adoption and acceptance studies have been shown to be consistent predictors of continued use. Third, post-adoption studies have used established TAM constructs successfully in their predictive models (Bhattacherjee 2001, Wang et al. 2009).

The concept of technology acceptance of computer information systems has been a topic of study for about as long as there have been information systems. Initial research related to this area focused on successful development and implementation of information systems (Alavi and Henderson 1981; Ives, Olson and Baroudi 1983), and transitioned to the success of information systems (Bailey and Pearson 1983, DeLone and McLean 1992). In 1986, Fred Davis wrote his doctoral thesis on technology acceptance, delivering the first version of the technology

acceptance model (TAM) which has proven to be one of the most influential and commonly employed theories in the field of information systems (Lee, Kozar and Larsen 2003).

The TAM model (Figure 2) is an extension of the theory of reasoned action (TRA) made relevant to the information systems field through the development and incorporation of the constructs perceived usefulness (PU) and perceived ease of use (PEOU) (Davis 1986). Over 20 years later, these two constructs are still considered influential and important in the study of technology acceptance (Benbasat and Barki 2007). The dependent variable actual system use was measured as self-reported use in the original TAM instruments. For the purposes of this dissertation, the first TAM model is referred to as TAM alpha.

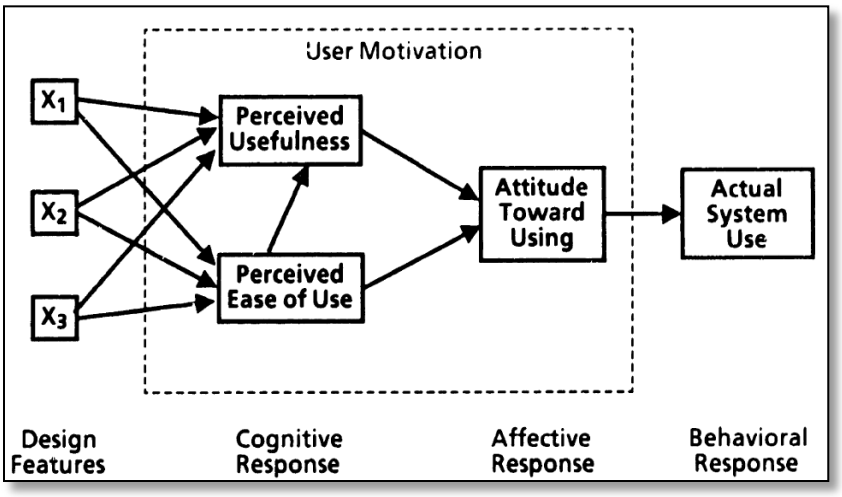

Figure 2. The first TAM model (TAM Alpha) (Davis 1986).

The TAM model introduced in Davis' thesis was followed soon after by two journal articles. The first focused on developing valid measures for the two main constructs, PU and PEOU (Davis 1989). The second included the first publication in a journal of a version of TAM (Figure 3) (Davis et al. 1989). This model was similar to TAM alpha, but acknowledged the influence of external variables on the PU and PEOU constructs. It also marked a return to the theory of reasoned action to add the behavioral intention to use (BI) construct as an intermediate

between attitude and actual system use (Davis et al. 1989). This model was first used to measure user acceptance of computers, and is referred to in this dissertation as TAM 1.

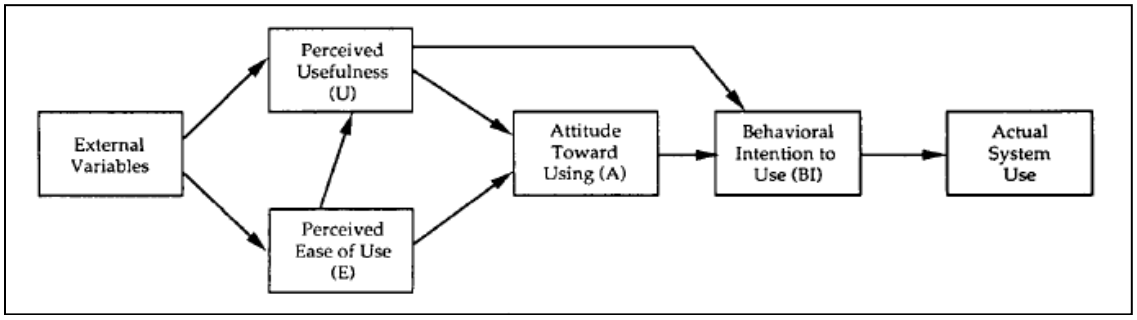

Figure 3. Technology acceptance model (TAM 1) (Davis et al., 1989).

Remarks made in the conclusion of the TAM 1 study revealed that the PU and PEOU constructs accounted for up to 57% of the variance in BI (Davis et al. 1989). This observation led to a popular version of TAM that is often referred to as parsimonious TAM (Cheng, Yang, Han & Song 2008, p. 284; Sharp 2006). This model (Figure 4) contains only the three most important constructs of TAM while still providing significant prediction power.

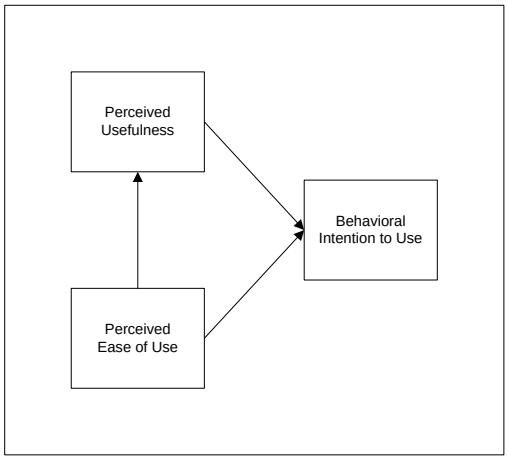

Figure 4. Parsimonious TAM (Davis et al., 1989).

After TAM had been in use for some years and had been applied to various problems and extended in various specific ways, a major extension of TAM was conducted to identify the determinants of PU and PEOU. The resulting model was labeled TAM 2 (Figure 5).

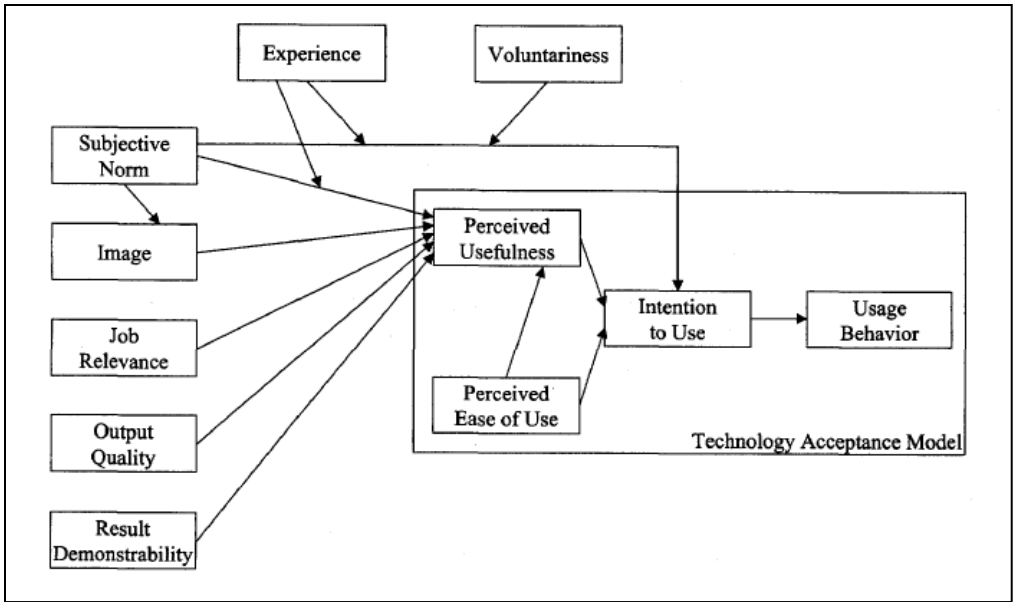

Figure 5. TAM 2 (Venkatesh & Davis 2000).

The success of TAM 2 led to further diversification in user acceptance models. In the years following, many versions of TAM were offered which included additional constructs such as "trust, cognitive absorption, self-efficacy, job relevance, image, result demonstrability, disconfirmation, information satisfaction, top management commitment, personal innovativeness, information quality, system quality, computer anxiety, computer playfulness, and perceptions of external control" (Benbasat & Barki 2007, p. 213). TAM's widespread customized use in all manner of technology acceptance research eventually led to confusion and criticism regarding the sheer breadth of models available, to the degree that several different models could be used which "routinely explain over 40% of the variance in individual intention to use technology" (Venkatesh, Morris, Davis & Davis 2003). An effort to create a unified model out of the eight most prominent extant user acceptance models resulted in the unified theory of acceptance and use of technology (UTAUT) (Figure 6).

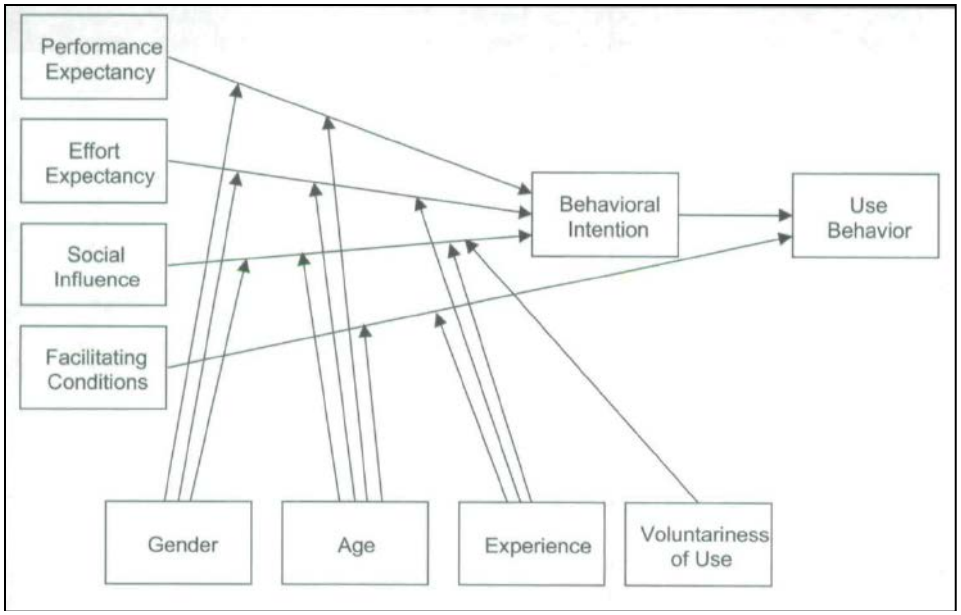

Figure 6. UTAUT model (Venkatesh & Davis 2003).

The most recent mainstream modification to the models for technology acceptance is the extension of the UTAUT model with an expanded system use construct and the addition of behavioral expectation (BE) as an antecedent to system use. This model is referred to in this dissertation as UTAUT 2 (Figure 7).

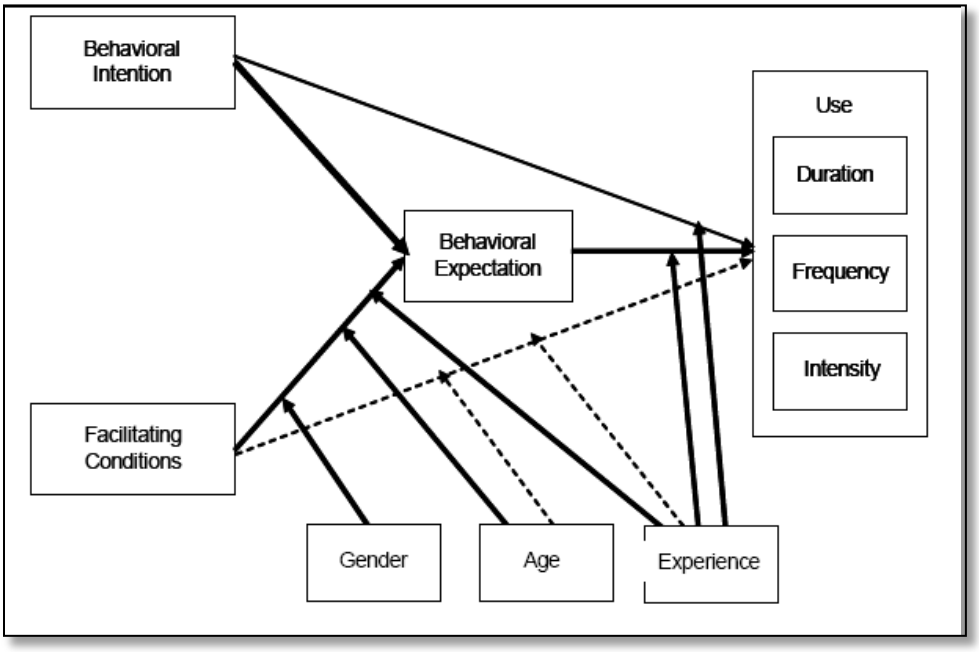

Figure 7. UTAUT 2 (Venkatesh et al. 2008)

A recent model has been presented, built on the research done with TAM and UTAUT, but focused on post adoption behavior. Saeed & Abdinnour-Helm (2008) suggest that the usefulness of an information system is affected by system integration and information quality, and usefulness in turn affects extended and exploratory usage which are characteristics of post adoption of a technology (Figure 8).

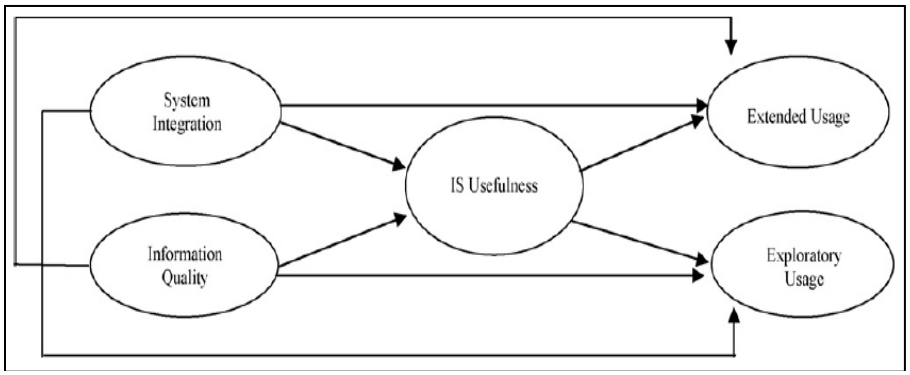

Figure 8. Saeed & Abdinnour-Helm (2008) model of post-adoption usage of IS.

Another recent addition is the model of acceptance with peer support (MAPS), which posits that an individual's embeddedness in the social network of an organizational unit increases the likelihood that the individual will accept a new technology offered for use within that organization (Figure 9).

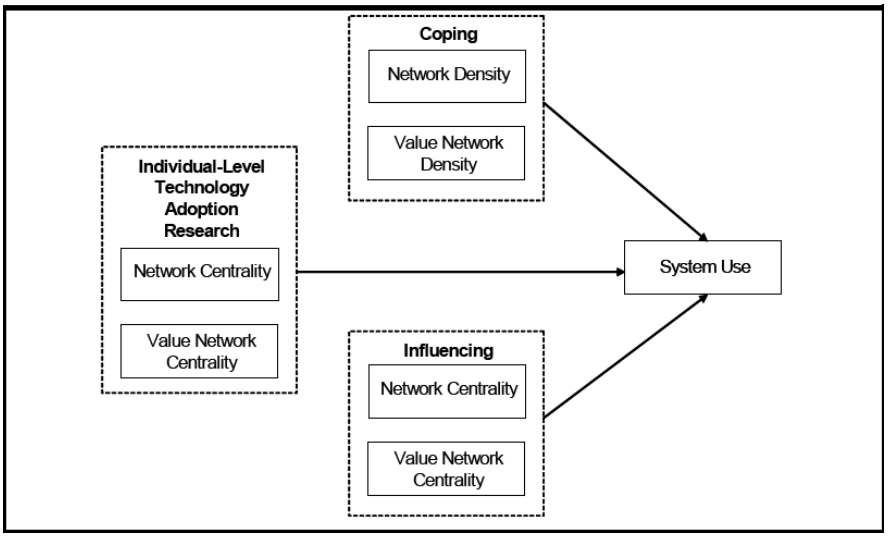

Figure 9. Model of acceptance with peer support (MAPS) (Sykes et al. 2009).

There have also been many models derived from or related to those listed above that were designed to examine specific types of technology, or specific research questions that were not limited to simply technology acceptance. Wixom & Todd's (2005) model combined technology acceptance with system success. Van der Heijden's (2004) modification of TAM for hedonic information systems included a new construct, perceived enjoyment. Preece (2001) authored a framework for determining and measuring success in online communities. Yet there has not been a model specifically designed to identify or predict the motivating factors that affect why people use SNAs.

The extensions and manifestations of TAM have all represented an evolution in the research of technology acceptance. Each new model has either provided expanded explanatory power, or uncovered more knowledge about the factors involved in user acceptance of technology. The TAM literature has also been particularly thorough in documenting and operationalizing many important constructs that may be important in predicting post-adoptive use of information systems in general, and SNAs in particular.

Technology Acceptance and Post-Adoption Model Fit to SNAs

There are two common themes with virtually all technology acceptance and IS post-adoption models. The first is the context of system use within organizational settings, such as the workplace. The second is the purpose of the system, which is almost always for utility or productivity. As an example of the underlying organizational context, here is the original TAM alpha model's primary research question:

> (1) What are the major motivational variables that mediate between system characteristics and actual use of computer-based systems by end-users in organizational settings? (Davis 1986)

Subsequent mainstream versions and extensions of TAM have continued to investigate phenomenon within the context of the organization. Few studies, in comparison, have looked at technology acceptance outside the organizational setting

A significant question therefore is whether a SNA, which is generally utilized outside an organizational context, is accepted in the same manner and for the same reasons as technology within an organizational setting? To begin answering that question, it is fruitful to examine SNAs for similarities to organizational computer information systems. First, SNAs are similar in that they can be considered information systems, which are "combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data" (Jessup & Valacich 2006, p. 5). Second, in the area of functionality, SNAs enable communication with individuals or groups of individuals that are members of the SNA. In a similar manner, organizational information systems facilitate communication with members of the organization.

However, SNAs also enable personal expression of identity and creative representation of the individual, while most organizational information systems do not. SNAs are often utilized by individuals for diversion or entertainment (Bumgarner 2007) or when they have time to waste (Pempek et al. 2009), while organizational information systems typically are not. Additionally, SNA use is typically considered a social activity (boyd 2008; DiMicco and Millen 2007), while organizational information systems use is characterized by utility or productivity (Huber 1982; Hewitt 1986).

These differences raise the question as to whether it is reasonable to assume that TAM models should be used to assess technology that is outside of an organizational setting. However, a closer inspection of the origins of TAM reveals that the underlying theories (TRA,

TPB) have no assumption of organizational context. There is also no compelling reason to believe that the usefulness aspect of two main constructs (PU and PEOU) must only refer to usefulness that is specific to job performance or another organization-specific or employment-specific idea. Therefore it is reasonable to assume that the TAM models should not be prohibited from measuring technology in a non-organizational setting simply because of their theoretical background and development. The only real barrier might be that the majority of research using the TAM models has been on technology within organizations.

Fortunately, various versions of the TAM model have been used in non-organizational settings, even though the volume of non-organizational research is low compared to the volume of organizational research. A typical non-organizational study starts with a version of TAM and adds one or more antecedents to key variables, then tests the model for fit (e.g., Vijayasarathy 2003; Pikkarainen, Pikkarainen, Karjaluoto and Pahnila 2004; Kwon and Chidambaram 2000; Gefen, Karahanna and Straub 2003; Hsu and Lin 2008). Various new antecedents are added to each model, usually in the form of salient beliefs theorized to affect the intention to use the application. The results of these studies of TAM in non-organizational settings are similar to the TAM studies done in organizational settings. There is usually a good model fit, and a reasonable amount of variance explained. Therefore, several successful studies of TAM use in non-organizational settings have been published. Because of this, there is essentially no barrier to fitting the various TAM models to the use of SNA technology.

Research Model and Constructs

To study the post-adoptive use of SNAs, a model was formed from a set of constructs taken from post-adoption literature, technology acceptance literature, and social capital theory. This particular set was chosen to account for the motivational factors expected to be present in

post-adoptive (continued) use. These constructs are present in the proposed research model presented below (Figure 10). Post-adoptive use is expected to be influenced by the user's continuance intention (the intention to continue using the application) and the limitations of the facilitating conditions in effect for that user. The user's continuance intention is expected to be influenced by the user's satisfaction with using the system, facilitating conditions, social influence, and attitude toward using. In turn, attitude toward using is expected to be influenced by perceived usefulness and social influence. Satisfaction is expected to be influenced by perceived ease of use, hedonic enjoyment, and perceived usefulness. Social capital is expected to influence hedonic enjoyment, experienced usefulness, and social influence.

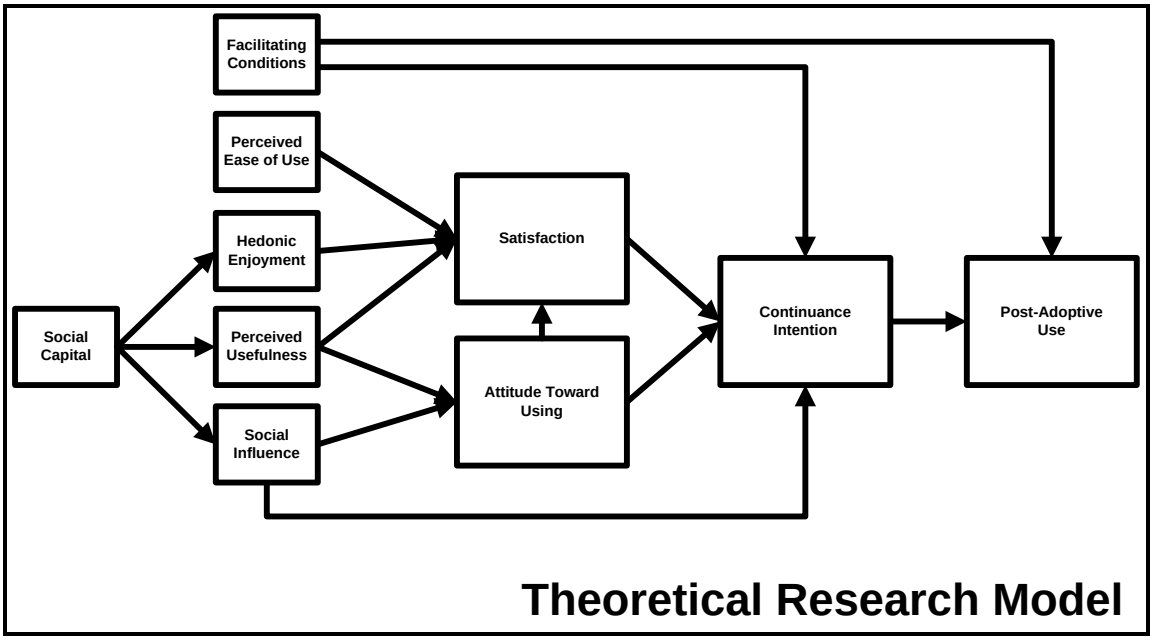

Figure 10. Research model

This model reflects the belief that some constructs commonly used in organizational technology acceptance studies may be irrelevant outside of an organization, which is the typical setting of SNA use. This section of the paper examines key constructs found in technology acceptance literature that are hypothesized to be either be important or irrelevant to the study of

SNA usage. These key constructs are as follows: continuance intention, satisfaction, perceived ease of use, social influence, attitude, hedonic enjoyment, perceived usefulness, social capital, facilitating conditions, age, gender, experience, and system usage. Each is discussed in more detail below.

Continuance intention is derived from Bhattacherjee's (2001) post-adoptive model of IS continuance. Just as behavioral intention to use was established as an antecedent to system usage in IT pre-adoption literature, continuance intention has been used as an antecedent to post-adoptive IT usage (Bhattacherjee 2001). Continuance intention in this study is the measure of a user's intention to continue using Facebook, and this intention should be positively associated with the measure of post-adoptive system use in the same way behavioral intention to use was found to be positively associated with pre-adoptive system use in many TAM studies. Thus:

H1: Continuance intention will have a positive effect on post-adoptive use.

The satisfaction construct also comes from the expectation-confirmation model established by Bhattacherjee for post-adoptive IS use. User satisfaction is a transient measure of cumulative experience expressed in either the positive, indifferent, or negative, and has been theorized and validated as an important predictor of use intention (Bhattacherjee 2001; Oliver 1980; 1981). In Bhattacherjee's model, perceived usefulness and confirmation of user expectations were found to influence user satisfaction, which in turn influenced the user's intention to continue to use the information system. It is hypothesized here that user satisfaction plays a similar role in post-adoptive SNA use, and that satisfied users will be more favorably disposed to continue to use Facebook.

H2: User satisfaction will have a positive effect on the user's continuance intention.

The attitude toward using construct, or how people feel about a system was present in

TAM Alpha and TAM 1, but removed in TAM 2 never to return (Davis 1986, 1989; Venkatesh & Davis 2000). Recently a call was made for its return (Benbasat & Barki 2007) based on a recommendation for future TAM studies to look more toward the theory of planned behavior. Attitude is a relatively enduring affect that transcends experiences alone, and reflects the emotional disposition of the user toward the technology (Hunt 1977; Oliver 1980; 1981). The attitude construct is a valuable measure that potentially accounts for salient beliefs other than those specifically measured in most acceptance instruments. Attitude has been theorized and validated in TAM-based studies as a significant predictor of intention to use (Davis et al. 1989; Karahanna et al. 1999; Taylor & Todd 1995; etc.). In this study, it is positioned as an antecedent to continuance intention, with two antecedents of its own (perceived usefulness and social influence). This structure is consistent with the positioning of attitude in TAM Alpha, TAM 1, and the theory of planned behavior. Additionally, attitude toward using is expected to influence satisfaction, as an evaluation of that emotion (i.e., whether the cumulative experiences are as emotionally favorable as expected) (Hunt 1977; Bhattacherjee 2001). Literature is divided on whether attitude is an antecedent to satisfaction (Linder-Pelz 1982; Moutinho & Smith 2000), or whether satisfaction is an antecedent to attitude (Taylor & Hunter 2003; Oliver 1980; Sivadas & Baker-Prewitt 2000). In developing SERVQUAL, Parasuraman et al. (1988) defined perceived quality as "a form of attitude, related but not equivalent to satisfaction," and "a form of overall evaluation of a product, similar in many ways to attitude." In the SERVQUAL model, these quality measures that are similar to attitude are antecedents to satisfaction. Attitude in this study is positioned as the antecedent to satisfaction because attitude toward using SNAs is suspected to be related to the expectations people have about use of the SNA. The relationship between expectations and satisfaction is that expectations generally affect satisfaction. Therefore:

H3a: Attitude toward using will have a positive effect on the user's continuance intention.

H3b: Attitude toward using will have a positive effect on the user's satisfaction.

Perceived ease of use has been present in technology acceptance research since TAM Alpha. It has proved to be a very useful measure of capturing relevant beliefs in the context of information technology usage (Benbasat & Barki 2007). It was originally defined by Davis over 20 years ago as "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis 1986), and that definition is still reasonably applicable to systems today. UTAUT's construct effort expectancy is defined as "the degree of ease associated with the use of the system" (Venkatesh et al. 2003), but its similarity to perceived ease of use illustrates that there has not been much movement from the original concept. Users who have progressed past their initial acceptance of a technology and have graduated to post-adoptive usage have accumulated substantial use experience (Saeed & Abdinnour-Helm 2008) which may affect the perception of the system's ease of use. Perceived ease of use has been well-established as an antecedent to behavioral intention to use in pre-adoption studies. In post-adoption, it is theoretically possible for users to experience difficulty using a system and yet continue to use it due to other motivating factors that outweigh their difficulties with its use. Thus, perceived ease of use is expected to have an effect on how satisfied the user is with using the SNA:

H4: Perceived ease of use will have a positive effect on user satisfaction.

Many studies of SNA usage point to the concept of entertainment or enjoyment as a benefit of using SNAs, and conversely a motivational factor for continued use (Agarwal and Mital 2009; Bolar 2009; Bumgarner 2007; DiMicco et al. 2008; Pempek et al. 2009; Subrahmanyam et al. 2008). This aspect of SNAs makes them at least in part a hedonic

information system. Hedonic information systems are designed to provide enjoyment to the user, while utilitarian systems (of which organizational information systems are a part) are designed to provide instrumental value to the user (van der Heijden 2004). A version of TAM developed for hedonic information systems includes the construct perceived enjoyment. Perceived enjoyment in the van der Heijden (2004) study was measured to have more predictive value than perceived usefulness, which typically has the high predictive value. Perceived enjoyment (or hedonic enjoyment as it is called in this study) appears to be highly applicable to SNAs, and is expected to influence the user's satisfaction with using the system. Therefore:

H5: Hedonic enjoyment will have a positive effect on user satisfaction.

Perceived usefulness has been present in technology acceptance literature since TAM Alpha, and has persisted through many technology adoption studies of various and diverse technologies. It is widely understood to be a very influential belief (Benbasat & Barki 2007), and appears in post-adoption studies (Bhattacherjee 2001, Wang et al. 2009, Al-Natour & Benbasat 2009). In Bhattacherjee's expectation-confirmation model, it is supported as an antecedent to user satisfaction and it is expected to do the same in this study. Additionally, the early TAM models containing attitude toward using found support for perceived usefulness influencing the attitude construct, and that is also hypothesized here.

H6a: Perceived usefulness will have a positive effect on user satisfaction.

H6b: Perceived usefulness will have a positive effect on attitude toward using.

Social influence was introduced into the TAM sequence in TAM 2 as three separate constructs, subjective norm, and image. Subjective norm was investigated for inclusion in TAM 1 but found to have no significant effect beyond perceived usefulness and perceived ease of use (Venkatesh & Davis 2000). In the studies that followed TAM 1 but preceded TAM 2, it was

found to have a significant effect on behavioral intention to use in some studies and found to have an insignificant effect in others (Venkatesh & Davis 2000). It is also present in UTAUT, defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al. 2003). In UTAUT it represents a combination of three factors: subjective norm, image, and social factors. However, the social factors concept in UTAUT is highly organizational and job-related, making it largely irrelevant to SNA use. In this study, the social influence construct is represented by the two dimensions of subjective norm and image. SNA use is considered to be a highly social activity. Therefore social influence is expected to play an influential part in system use through its affect on both the user's continuance intention the SNA, and the user's attitude toward using.

H7a: Social influence will have a positive effect on a user's continuance intention.

H7b: Social influence will have a positive effect on a user's attitude toward using.

Online communities and SNAs have a social aspect not found in many other types of information systems or online applications. One manifestation of the social facet of these applications is the presence of social capital. Social capital has been defined as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal 1998, p. 243). Another way to understand social capital is as the benefits realized through the relationships in which the individual participates. Social capital has been found in online communities (Drentea and Moren-Cross 2005; Chiu, Hsu and Wang 2006; Ryan 2010), digitally enabled teams (Robert, Dennis and Ahuja 2008), and in SNAs (Ellison et al. 2007; Joinson 2008; Pfeil et al. 2008; Steinfield et al. 2008). Social capital's close association with networked relationships makes it a likely candidate for inclusion as a motivational factor for continued SNA usage. On the

individual level, social capital has been modeled as an antecedent of knowledge integration (Robert et al. 2008), and as an antecedent of affective feelings toward SNAs (Wu, Ryan & Windsor 2009). Certain aspects of social capital have also been postulated to be gained through using SNAs (Ellison et al. 2007).

It is worth noting that there is no consensus definition of social capital (Adler and Kwon 2002). It has been conceptualized as both a cause (Resnick 2001) and an effect (Williams 2006), and while generally considered to be beneficial (Nahapiet and Ghoshal 1998), has been theorized to have a negative manifestation as well (Portes 1998; Kostova and Roth 2003).

Social capital has been operationalized in information systems literature in a number of studies. It has been found as a benefit to project teams (Newell, Tansley and Huang 2004), as a benefit to individuals in knowledge communities (Widen-Wulff and Ginman 2004), and as benefits to membership in online communities (Yuan, Gay and Hembrooke 2006; Drentea and Moren-Cross 2005; Preece 2002).

Social capital has been examined in a few SNA studies. Ellison, Steinfield and Lampe (2007) found "bridging," "bonding," and "maintained" social capital among users of Facebook. Joinson (2008) found social capital manifested in maintained relationships on Facebook. Pfeil et al. (2008) found differences in social capital derived from SNAs between age groups. Donath and boyd (2004) found that SNA use supports the formation and maintenance of weak relational ties, which is considered "bridging" social capital.

Recently, social capital was operationalized in a study of digitally enabled teams as a construct with three dimensions (structural, relational, and cognitive) (Robert et al. 2008). These dimensions follow the conceptualization of social capital by Nahapiet and Ghoshal (1998), which holds that social capital is derived through the network of relationships possessed by the

individual (Nehapiet and Ghoshal 1998). The items and scale for this measure of social capital are conducive to measurement of SNA users.

The elastic nature of social capital makes it a complex construct. As previously mentioned, it has been studied as both a cause and an effect. In the case of SNA usage it is suggested that social capital will likely be manifest as both a cause and an effect. For initial adoption and use of SNA technology, actual social capital will likely have little influence (but perceived social capital might). However, after continued use, literature suggests that aspects of social capital will be experienced as a benefit by the user, which will serve as additional motivation for continued use.

In this study social capital is hypothesized to affect perceived usefulness, social influence and hedonic enjoyment. The relationship between social capital and social influence is suggested by the correlation between the nature of social capital as being benefits derived from networked relationships with friends and relatives, and social influence which is concerned with what others think of Facebook and those who use it. Social influence in this study includes the user's image of Facebook users, and peer/society pressure to use Facebook. It is proposed that the more the user experiences benefits from their relationships with friends and relatives, the more influence the opinions about Facebook from those people will have on the user. The relationship between social capital and hedonic enjoyment is suggested by the idea of social capital as a benefit, making it reasonable to assume that experiencing benefits would contribute to the enjoyment of the individual. The relationship between social capital and perceived usefulness is also suggested by the idea of social capital as a benefit. One of the benefits expected to be realized is the utility of tapping into social networks. Therefore:

H8a: Social capital will have a positive effect on a user's hedonic enjoyment.

H8b: Social capital will have a positive effect on the perceived usefulness of the SNA.

H8c: Social capital will have a positive effect on the social influence a user experiences.

The facilitating conditions construct used in the theoretical model comes from UTAUT and was in turn derived from a combination of constructs (perceived behavioral control, facilitating conditions, and compatibility) from several authors, and was defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al. 2003, p. 453). The broad concept of facilitating conditions is relevant for social networking systems, but the particular conditions will be different. For example, as previously mentioned, SNAs are generally used outside of an organizational structure. Therefore the typical user has no need for an organization infrastructure to support their use of their SNA. Also, the concept of compatibility with other systems used for work is not applicable to social networking systems which are not work systems. Still, facilitating conditions are obviously present for users of technology outside the organization. Available time to use the system, access to application-enabling devices and the Internet, the means to get help if needed, are all aspects that allow the smooth and unobstructed use of a SNA. Facilitating conditions in this study is defined as "the degree to which an individual believes that conditions are in place to facilitate their ready, easy, and effective use of the system".

The UTAUT model supports the direct influence of facilitating conditions on system usage based on other studies in the field. In other models, such as the theory of planned behavior, the perceived behavioral control aspect of facilitating conditions has been shown to be a predictor of attitude, behavioral intention, and behavior. However, the presence or lack of perceived ease of use seems to make a difference how the facilitating conditions construct behaves in a model (Venkatesh et al. 2003). That is to say, it changes its relationship as an

antecedent to several constructs or system usage alone depending on whether ease of use measures are also present. Since ease of use measures are present in the theoretical model, facilitating conditions should have a direct affect on system usage, and an insignificant effect on behavioral intention to use if this were a pre-adoption model according to UTAUT (Venkatesh et al. 2003). However, the re-introduction of the attitude construct as an antecedent to intention to continue using is a wrinkle not accounted for in UTAUT. Facilitating conditions includes physical, time-based, and technology-based limitations on the user's ability to use the technology. These limitations are known to the user and should be reflected both in their intention to use and in their actual system use. Because of this, it is hypothesized that facilitating conditions influence both continuance intention and actual post-adoptive use thus:

H9a: Facilitating conditions will have a positive effect on a user's continuance intention.

H9b: Facilitating conditions will have a positive effect on a user's post-adoptive use.

There were a number of moderating factors introduced by the UTAUT model which were shown to influence various relationships in that model. Age, gender and experience were hypothesized to affect the influence of several variables on others in the UTAUT model, including performance expectancy (perceived usefulness with a job-related context) on behavioral intention to use, effort expectancy (derived from perceived ease of use) on behavioral intention to use, and social influence on behavioral intention to use. Gender and age hypotheses were supported primarily by studies on working women, and worker age (Venkatesh et al. 2003). The extant literature on Facebook and gender is sparse. Ellison et al. (2007) tested the relationship between gender and intensity of use in Facebook and found no significant interaction. Outside of a job-related context, there is a lack of evidence at this time that gender significantly affects SNA post-adoption usage. Therefore gender is not included as a moderator

in the theoretical model. Experience is also not anticipated to be a significant modifier because of the context of post-adoption which entails that all users have significant experience using the system due to their system use beyond initial acceptance. In the UTAUT model, age was shown to be a modifier of several construct relationships through its influence on behavioral intention to use. While these moderating relationships may hold for SNA usage, the expected sample population of students is not expected to have enough variance in age ranges to make it a significant measure. Therefore, age is not included as a moderator.

The Usage Construct

System usage has been a part of user acceptance since the first TAM model. Yet recently a call has been made to refine what is meant by system usage as well as what is actually being measured. Traditional IS studies have measured system use as an amount or frequency, which is a simplistic view of usage and one that has important shortcomings (Benbasat and Barki 2007). System usage can be seen as a much more complex factor, and is able to be measured more precisely if the researchers desire (Burton-Jones and Straub 2006; Jasperson, Carter and Zmud 2005).

TAM Alpha, TAM 1 and TAM 2 all measured self-reported use on a limited scale of frequency (Davis 1986; Davis et al. 1989, Venkatesh and Davis 2000). UTAUT measured actual system use using undisclosed system metrics (but there is no mention of time, frequency, intensity, features, etc.) (Venkatesh et al. 2003). UTAUT 2 measured system usage through self-reported measures of intensity, frequency, and duration (Venkatesh et al. 2008). It can be seen that the various TAM models have over time developed a more complex measure of system usage, albeit very slowly.

Burton-Jones and Straub (2006) delivered a reconceptualization of the system usage construct, identifying six types of richness for system usage measures. The first type, characterized as very lean, measures only use or non-use of the system. The second type, characterized as lean, measures duration and/or extent of use. The TAM models from Alpha to UTAUT models fall into this second category. The third type is characterized as somewhat rich, and measures the breadth of use by the number of features used. The fourth type, characterized as rich, measures the extent to which the user employs the system, or intensity of use. The fifth type, also characterized as rich, measures the extent to which the system is used to carry out tasks, or the variety of use. The sixth type, characterized as very rich, measures the extent to which the user employs the system to carry out the task. The UTAUT 2 usage measure covers three aspects of system use: frequency, duration, and intensity, which encompasses parts of types 1, 2, and 4. and therefore can be classified between somewhat rich and rich, according to the Burton-Jones and Straub richness of measures scale.

The importance of the system use construct cannot be overstated. It has been the dependent variable for a steady stream of technology acceptance studies for many years. The technology acceptance studies have generally suffered from an underdeveloped system usage construct (Benbasat and Barki 2007, Straub and Burton-Jones 2007). In this study I expand on the system usage construct used in UTAUT 2 by adding items designed to measure the breadth of usage in addition to frequency, duration and intensity, thus clearly moving the measurement of usage toward the rich category.

CHAPTER 3

RESEARCH METHOD

This chapter describes the research methodology used to test the hypotheses set forth in the previous chapter. Data collection and sample size are discussed. Data analysis methods are explained and supported. The development and testing of the research instrument is detailed.

Research Population and Sample

Users of Facebook come from many walks of life and many different age ranges. There is no organizational tie common to Facebook users as the application is free to use for any Internet user. Students in particular have been shown to be heavy Facebook users as evidenced by their inclusion as sample populations in many studies (Hewitt 2006; Lampe et al. 2006; Mazer 2007; Mitchell 2007; Pempek 2009; etc.). Students are also the target of organizations who join Facebook specifically to reach them (Anonymous 2008). As of 2009, Facebook had a greater than 85% market share among students of four-year universities in the United States (Wandel 2008). Therefore, a significant sample of the population studied was students. The sample surveyed consisted of undergraduate and Master's students taking courses in the College of Business at a large midwestern university.

A priori power analysis suggests that a sample size of 454 is necessary to achieve a power of .95 with a 0.05% alpha using structural equation modeling, targeting a 0.90 goodness of fit indicator (GFI) (MacCallum & Hong 1997). This guideline was met.

Research Design

The primary research strategy used in this study is a field study. Field studies are non-experimental scientific investigations that seek to discover the relations and interactions among psychological, sociological, and educational variables that take place in real social settings.

Field studies are appropriate for examining relationships and testing hypotheses in life situations (Kerlinger & Lee 2000, p. 585). The research method used for the field study is a survey questionnaire. Surveys have been used extensively in both post-adoptive and technology acceptance research, and in all of the technology acceptance models referenced in this dissertation.

Pilot Study

The survey instrument used in this dissertation was developed through a series of steps. First, a pilot survey was developed incorporating constructs and items from previously established instruments as well as modified constructs and items from established instruments and literature. The pilot survey was examined for content validity by two other researchers who have published research on the subjects of social networking applications and system usage. The pilot survey was tested by administration of a "pre-pilot" among undergraduate students of a business course at a large Midwestern university. The pre-pilot respondents took the survey, commented on its clarity, and checked it for errors. Changes were made to the pilot survey based on comments and suggestions from the pre-pilot sample population.

The pilot study was then administered to a selection of four classes in the College of Business of a large Midwestern university in the United States with the permission of the instructors of the classes. Out of a total of 232 possible respondents, 118 participated in the pilot for a response rate of 51%. The sample was too small to use with structural equation modeling, but the constructs were examined using exploratory factor analysis for validity and Cronbach's alpha for reliability.

The exploratory factor analysis revealed that some measuring items for the attitude construct cross-loaded with the measuring items for the hedonic enjoyment construct. Closer

inspection revealed that the attitude construct adapted from early TAM instruments contained several measurement items similar to the hedonic enjoyment measure, such as "working with the system is fun," and "I like working with the system." Furthermore, the EFA revealed poor factor loading for "using my SNA is a bad idea," even though a similar measure "using my SNA is a good idea" loaded strongly. The solution was to look for a better measure of the attitude construct that did not incorporate aspects of hedonic enjoyment. The solution was found in four measurement elements from a TAM study done by Malhotra & Galletta (1999) in which they ask users to rate their feelings about the technology on a negative/positive continuum with statements such as "using the system is a good/bad idea," using the system yields positive/negative results," "using the system is harmful/beneficial," and "using the system is a wise/foolish idea." A fifth measure was added from similar study by Nysveen, Pederson and Thorbjornsen (2005) which states "using the system delivers a(n) favorable/unfavorable experience.

Focus Groups

Additional research was done on construct formation in the form of focus groups made up of Facebook users. Focus groups are a kind of group interview that takes advantage of communication between research participants in order to produce data (Kitzinger 1995). Focus groups emphasize group interaction as part of the method, which means that participants are encouraged to talk to one another and exchange information and ask questions about one another's experiences and points of view. This method is particularly helpful for understanding participants' knowledge, feelings, and also how and why they think the way they do (Kitzinger 1994).

The focus groups consisted of groups of 4 to 8 Facebook users who engaged in a semi-structured interview format with the primary investigator. Initial questions were asked, such as "why do they use Facebook?" and "what do they use Facebook to do?" Focus group respondents were encouraged to expand on any answer of interest, and to freely discuss any topics related to the one under discussion. The knowledge gained from the focus groups did not impact theorized relationships, but it was used to help determine which established scale of social capital was appropriate for social network application use, and how long after initial Facebook use it took for a user to consider themselves an adopter of Facebook. The initial questions asked of all participants in the focus groups are listed in Figure 11.

1. Why do you use Facebook?
2. What do you use Facebook to do?
3. What social benefits do you feel you receive from using Facebook?
4. Is Facebook important to your current lifestyle? How?
5. Would you say Facebook is useful to you, and if so in what ways?
6. Describe your usage of Facebook in terms of when you use it, where you use it, how long you use it, how frequently you use it, how involved you are when using it, and how many features you would say you use?

Figure 11. Focus group questions.

The interaction among participants in the focus groups revealed that the average time it took for a user to consider themselves a Facebook user was very short, usually within two weeks of continuous use. Another notable observation was the kinds of social capital experienced by Facebook users, which included bridging, bonding (Williams 2006), maintained (Ellison et al. 2007), structural, relational (Robert et al. 2008), cognitive (Chiu 2006), emotional support, instrumental support, and community building (Drentea & Moren-Cross 2005). Participants also suggested that perceived usefulness is a strong motivational component for both adoption and continuous use, and that one of the most useful aspects of Facebook is its widespread adoption

which enables users to communicate with their family and friends who also use the application.

Cronbach's alpha analysis on all items for subjective norm yielded an overall alpha of 0.616, but exploratory factor analysis revealed that the original single construct intended for the measure of subjective norm and adapted from UTAUT's social influence construct and TAM 2's subjective norm construct exhibited two-dimensional behavior. Closer inspection revealed that the adapted UTAUT items which measure direct peer pressure (i.e., "people who have an influence on me think I should use Facebook" correlated strongly together, and the TAM 2 items which measure indirect peer pressure or system popularity (i.e., "many of my friends use a social networking application") correlated strongly together. The solution was to treat subjective norm as a two-dimensional construct, and split the two scales into subjective norm – influence and subjective norm – conformity, where the direct peer pressure measures were collected in subject norm – influence, and the measures of indirect peer pressure and/or system proliferation among contacts were collected in subjective norm – conformity.

The pilot study also revealed a small number of typographical errors in the study questions, and an error in the seven-point demographic scale for age where a person who was 20 years old had no available choice to record their age.

Primary Survey Instrument

The primary survey instrument is based on the theoretical research model, and reflects the knowledge gained through administration and analysis of the pre-pilot study, the pilot study, and the focus groups. The survey instrument is provided in the appendix. The instrument measures ten constructs and each is detailed below.

Measurement Constructs

Facilitating Conditions

This scale comes from UTAUT, but was built using items from other established constructs including behavioral control. Items used to measure this construct were taken directly from UTAUT, and additional items were formulated to match Facebook use according to the definition of the UTAUT construct. Six total items are used to measure this construct.

Perceived Ease of Use

Perceived ease of use was present in UTAUT (under the name effort expectancy) and all of the TAM-related models. It is defined in UTAUT and here as "the degree of ease associated with the use of the system" (Venkatesh et al. 2003). Most of the items used to measure it were very similar. Three items were taken from UTAUT and one new item was created to match Facebook use according to the spirit of the construct. Four total items are used to measure this construct.

Perceived Usefulness

This is another construct present in virtually all the TAM-related models. It is defined as the degree to which a person believes that using the application will help them accomplish their goals effectively. The items used to measure it were very similar to other instances of the construct in related models. Three items were taken from the TAM 1 model and two new items were created to match Facebook use according to the definition of the construct. Five total items are used to measure this construct.

Satisfaction

The satisfaction construct comes from Bhattacherjee's post-adoptive IS use model. It asks the users to disclose their level of satisfaction/dissatisfaction, pleasure/displeasure,

contentment/frustration, and delight/non-delight with their overall experience using their current SNA. Four total items are used to measure this construct.

Social Influence

Social influence was formulated in UTAUT as a combination of subjective norm, image, and social factors, the latter of which was a very job-related measure and did not fit the context of Facebook users. It is defined as the degree to which an individual perceives than other people important to them believe he or she should use the application. In this dissertation, items from image and subjective norm derived from UTAUT and TAM 2 were combined to form this construct. Seven total items are used to measure this construct.

Hedonic Enjoyment

Hedonic enjoyment is defined as the degree to which an individual experiences enjoyment while using the application. This instance of the construct was derived from two constructs used in prior studies, one called hedonic enjoyment (Waterman, Schwartz and Conti 2006) and the other perceived enjoyment (van der Heijden 2004). One item was taken from Waterman et al. 2006, one item was taken from van der Heijden (2004), and two new items were created to match Facebook use according to the definition of the construct. Four total items are used to measure this construct.

Attitude Toward Using

Attitude toward using is defined as the degree to which an individual has a favorable or unfavorable evaluation or appraisal of using the application. The attitude construct was measured in UTAUT but theorized not to be a predictor of intention to use within the context of that study. The items used to measure attitude in UTAUT were a combination of attitude, affect, and intrinsic motivation. It included some items similar to those used to measure hedonic enjoyment.

The attitude construct initially intended to be used in this study mirrored the measures used in TAM 1 and the theory of reasoned action. Two items were taken from UTAUT's description of TAM 1's instrument, and four new items were created to match Facebook use according to the spirit of the construct definition. Six total items were used to measure this construct during the pilot study.

Continuance Intention

Continuance intention is defined as the degree of an individual's intent or plan to continue to use the application after initial adoption or acceptance. This measure was taken from Bhattacherjee's ECM model. Three total items are used to measure this construct.

Social Capital

Social capital is defined in this study as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998, p. 243). The social capital construct does not necessarily have a single established instrument. Many different measurement instruments have been used in recent studies, including but not limited to: Inkpen & Tsang 2005; Kuo, Lai & Wang 2008; Lee & Sukoco 2007; Luk, Yau, Sin, Tse, Chow & Lee 2008; Wah, Menkhoff, Loh, & Evers 2007; Chiu, Hsu & Wang 2006; Drentea & Moren-Cross 2005; Ellison et al. 2007; Robert et al. 2008. For this study, the social capital measurement instrument was adapted from Ellison et al. (2007), which draws on Putnam (2000)'s distinction between bridging and bonding. Some items were changed to reflect SNA usage and structure. The social capital construct as operationalized in this study consists of three dimensions: bridging, bonding, and maintained. The bridging dimension contains 4 measurement items, the bonding dimension contains 4 measurement items, and the maintained dimension contains 5 measurement items.

Post-Adoptive Use

Post-Adoptive Use in this study was initially adapted from UTAUT 2's version of system usage, which measures three aspects of usage (with a single item each): Duration, frequency, and intensity of use, which are cited as the three most common conceptualizations of system use (Venkatesh et al. 2008). The intensity of use measure was discovered to be confusing when applied to SNAs in a pilot study, and thought to be problematically vague when checked for content validity by other researchers in the context of SNA use. The concept of intensity was operationalized for system usage in the UTAUT 2 model (Venkatesh et al. 2008) and said to be synonymous with extent of use. In this study, intensity and extent of use are considered to be different measures of two separate usage aspects. The first aspect is operationalized as the concept of involvement or immersion in the use of the SNA, which is supported as an aspect of SNA usage by literature (Warr 2008, Horowitz 2009). The second usage aspect, extent, represents the concept of breadth of use, or how much of the system is actually used, and is operationalized as a measurement of the degree of feature-usage by the individual, as suggested for richer usage measures by Burton-Jones & Straub (2006). Seven measurement items are used; one each for duration, frequency, three for involvement, and two for extent. This measure follows the lead of the UTAUT (Venkatesh et al. 2003) measure of system usage, which measured duration, frequency, and intensity. This construct constitutes the first instance of this combination of system use measures that the author is aware of.

To differentiate between pre-adoptive system usage and post-adoptive use, an effort was made to determine the length of continuous system usage required to transform a user from someone learning or trying out the product to an accomplished dedicated adopter. During the focus groups conducted prior to the main study, each participant was asked for their opinion

regarding how long it took from their first use of Facebook for them to adopt it as an application they regularly used, and how long it took from their first use of Facebook before they would have called themselves a Facebook user. The answers to both questions were largely identical, and averaged from 1 to 2 weeks, with no respondent naming a time longer than 3 weeks. For this study, the determination was made to require at least 30 days of regular Facebook use by each user surveyed in order to consider their use post-adoptive.

Survey Administration

A sample survey was used to collect data for this study. The target population is undergraduate and master's students taking courses in the College of Business at a large Midwestern university. The sample surveys were administered to individual students grouped by classes in cooperation with the instructor of each class. Four instructors were contacted near the end of the fall 2009 semester with the request to survey their students, and three agreed to allow their class to participate. The following spring semester eleven more instructors were contacted with the request to participate, and all agreed to allow their students to participate. The surveys were administered either using a paper survey instrument or an electronic survey instrument depending on the preference of the instructor. Some instructors chose to offer a negligible amount of extra credit to their students as incentive to participate (less than 1% of a students' grade in all cases). There were a total of 4 paper surveys taken and 10 electronic surveys taken. The paper surveys were announced by the instructor in the class periods preceding the event. They took place in a single span of about 25 minutes at the end of the announced class period. The electronic surveys were announced to the students and made available for a four-week period during which time the student could take the survey at any time by following a web

browser link provided. Announcements were made at least once per week, and the surveys were closed at the end of the four week period.

CHAPTER 4

DATA ANALYSIS AND RESULTS

This chapter describes the data analysis process and presents the results. This chapter is divided into two sections. The first section describes the data collection procedures and the demographic characteristics of the respondents. The second section presents the data analysis process and the results of the analysis.

Initial Response

Overall a total of 1691 students had the potential to be surveyed (based on class enrollment at the time of survey administration), and 1190 total responses were recorded (this total does not include blank responses or extremely incomplete responses likely to be disconnections from the electronic survey tool). The response total yields an aggregate response rate of 70.4%, which is favorable.

Non-response bias has been addressed in past survey research by comparing early responses with late responses to determine if there are any differences between the two groups of respondents (Karahanna, Straub, and Chervany 1999; Ryan, Harrison, and Schkade, 2002). This method was employed using the results from the electronically administered surveys which record the date and time of responses. Respondents were split into two groups, where the first group consisted of responses received during the first two weeks after the announcement that the electronic survey was available, and where the second group consisted of responses received during the last week the survey was active before it closed. The differences between the two groups were examined using t-tests on each group's responses to the independent and dependent variables. The results are displayed in Table 4, and show no significant differences between the groups, suggesting that non-response bias is not a significant influence in this study.

Table 4. T-Tests for Non-Response Bias		
VARIABLE	**T-VALUE**	**P-VALUE**
Social Influence	-0.963	0.336
Attitude	-0.629	0.530
Perceived Usefulness	-0.514	0.607
Perceived Ease of Use	0.056	0.955
Hedonic Enjoyment	-0.072	0.943
Continuance Intention	-0.88	0.930
Satisfaction	0.544	0.587
Social Capital	0.131	0.896
Post-Adoptive Use	-1.085	0.279

Demographics

A demographic profile of the respondents is shown in Table 5.

Table 5. Demographic Information		
	Criteria	**Percentage**
Age	20 or under	23.5%
	21-25	56.0%
	26-30	10.2%
	31-35	5.0%
	36-40	2.8%
	41-50	2.0%
	Over 50	0.5%
Gender	Male	56.2%
	Female	43.8%
Academic Level	Undergraduate	96.1%
	Masters	1.8%
	Doctoral	0.3%
	Other	1.8%
Academic Major	Accounting	24.4%
	Decision Science	3.0%
	Finance	11.2%
	Information Technology	8.5%
	Management	13.8%
	Marketing	18.6%
	Other	20.4%
Income	Less than $30,000/yr	19.6%
	$30k to less than $60k	25.4%
	$60k to less than $90k	18.2%
	$90k to less than $120k	17.9%
	$120k or more	18.8%

Approximately 80% of the respondents were under 25, which is consistent with the student population sampled. Slightly more males than females took the surveys, and over 96% were undergraduate students. The academic majors were primarily business majors, as expected from the environment. The income ratios were mixed.

The 1190 total responses were then pared down to make each response relevant to the study. A response was only kept if it met the following criteria: 1) the user expressed that they had used a social networking application before, and that they were currently using a social networking application now; 2) the user supplied the name of the SNA they used most often as Facebook (users were instructed in the survey to answer questions in the context of the use of the SNA they used most often); 3) the user indicated they had more than one month of experience using their SNA. The total number of responses left after this process totaled 783.

Data Analysis

The variables used in this study were measured using several items each in a survey instrument. The ability of the instrument to properly measure these variables is typically evaluated by assessing the construct validity of each variable (Hair et al. 1998; Kerlinger & Lee, 2000). Two common indicators of construct validity are dimensionality and reliability (Kerlinger & Lee, 2000), which can be evaluated using Cronbach's alpha and exploratory factor analysis (Beatty et al. 2001).

First, the dimensionality of the items was examined using principal component factor analysis with a Varimax rotation. A ratio of five samples for every variable examined in a single factor analysis is recommended for an accurate assessment (Hair et al. 1998). The largest single factor analysis includes 25 variables, and the sample size to be analyzed is 786, which is sufficient for such an analysis.

Exploratory factor analysis (EFA) was conducted with the number of factors extracted based on the eigenvalue being greater than one. The resulting factors extracted were examined and analyzed according to the following two criteria: First, items having factor loadings of more than 0.5 on the construct on which they are expected to load can be considered to be a satisfactory measure of that construct. Second, items having factor loadings of more than 0.45 on constructs other than the one they are expected to load on are considered cross-loading items and are not dependable measures of the expected construct (Hair et al., 1998). Separate factor analyses were conducted for the independent, mediating, and dependent variable groups respectively rather than a single factor analysis for all variables at once, which would result in a correlation matrix of over 1900 and be of little value (Jones and Beatty, 2001; Gefen and Straub, 2005).

The independent variables for this study are facilitating conditions (FC), perceived ease of use (PEOU), and social capital (SC) which is represented in three dimensions. In all, 23 items were expected to load on five factors, which it did (see Table 6). The results of the EFA show that each construct loaded on its own factor with the exception of two items from the facilitating conditions construct which loaded with perceived ease of use. Further examination of the items used to measure FC1 and FC2 suggested that they may not be appropriate measures of facilitating conditions for the population. FC1 ("I have the technology available to me to use my current SNA when I want to") and FC2 ("I have the knowledge and skills necessary to use my current SNA") were derived from instruments used to measure the facilitating conditions of pre-adoptive system use (Venkatesh et al., 2003), and may not be as effective for a situation where the system has already been adopted and is in current and continuous use. Therefore, the measurement items FC1 and FC2 were removed and the factor analysis re-run (see Table 7).

Table 6. First Run EFA on Independent Variables					
Items	**Components***				
	1	**2**	**3**	**4**	**5**
PEOU4	0.851				
PEOU3	0.844				
PEOU1	0.812				
FC2	0.738				
PEOU2	0.612				
FC1	0.511				
SCM3		0.803			
SCM5		0.803			
SCM2		0.752			
SCM4		0.749			
SCM1		0.677			
FC5			0.903		
FC4			0.865		
FC6			0.834		
FC3			0.530		
SCBR1				0.847	
SCBR2				0.814	
SCBR3				0.764	
SCBR4				0.683	
SCBO2					0.854
SCBO1					0.825
SCBO4					0.756
SCBO3					0.634

Table 7. Second EFA on Independent Variables					
Items	**Components***				
	1	**2**	**3**	**4**	**5**
SCM5	0.812				
SCM3	0.811				
SCM4	0.751				
SCM2	0.751				
SCM1	0.687				
PEOU4		0.854			
PEOU3		0.851			
PEOU1		0.841			
PEOU2		0.651			
FC5			0.914		
FC4			0.873		
FC6			0.851		
FC3			0.528		
SCBO2				0.868	
SCBO1				0.838	
SCBO4				0.763	
SCBO3				0.646	
SCBR1					0.855
SCBR2					0.819
SCBR3					0.759
SCBR4					0.681

* item loadings of less than 0.3 suppressed
PEOU: Perceived Ease of Use
FC: Facilitating Conditions
SCM: Social Capital – Maintained
SCM: Social Capital – Maintained
SCBR: Social Capital – Bridging
SCBO: Social Capital – Bonding

Next, each factor was examined for reliability using Cronbach's alpha. An acceptable Cronbach's alpha value is generally 0.7 or higher (Hair et al., 2006). Several items scored less than .7, and were dropped from the instrument to facilitate more parsimonious measurement. The lowest loading item was FC3 at 0.528. That item was dropped, and the EFA re-run to assess the effect on other variables. The single lowest loading factor in the next analysis was again dropped, with the process continuing until no single item loaded on a factor with a value less than .7. In this manner, the following items were dropped in sequence: FC3, then SCBO3, then PEOU2, then SCBR4, and finally SCM1. Each construct retained at least three items of measurement. The results are shown in Table 8. The Cronbach's alpha values for the component factors are all greater than .890, yielding acceptable results. The reliability results are displayed at the bottom of Table 8.

Table 8. Final EFA on Independent Variables

Items	**Components***				
	1	**2**	**3**	**4**	**5**
SCM5	0.838				
SCM3	0.827				
SCM4	0.747				
SCM2	0.747				
FC5		0.935			
FC6		0.885			
FC4		0.866			
PEOU4			0.872		
PEOU3			0.871		
PEOU1			0.848		
SCBO2				0.880	
SCBO1				0.844	
SCBO4				0.769	
SCBR1					0.894
SCBR2					0.857
SCBR3					0.773
Mean	5.265	4.974	5.701	4.973	5.043
Eigenvalues	2.968	2.722	2.681	2.535	2.523
Variance explained	18.55%	17.01%	16.76%	15.84%	15.77%
Cronbach's alpha	0.901	0.933	0.916	0.896	0.900

* item loadings of less than 0.3 suppressed
PEOU: Perceived Ease of Use
FC: Facilitating ConditionsSCM: Social Capital – Maintained
SCM: Social Capital – Maintained
SCBR: Social Capital – Bridging
SCBO: Social Capital – Bonding

Convergent and discriminant validity are commonly used assessments of construct validity (Huck, 2004). Multiple items purported to measure the same construct can be shown to have convergent validity if it can be demonstrated that they are highly correlated to each other (Campbell & Fiske, 1959). Convergent validity is evident for the independent variables through their factor loadings of greater than 0.5 on the same component. Discriminant validity ensures that a given construct is able to be empirically differentiated from another construct that may be similar (Kerlinger & Lee 2000, p. 672). Discriminant validity is evident for the independent variables through the absence of significant cross-loadings with other components.

The mediating variables for this study include hedonic enjoyment (HE), perceived usefulness (PU), satisfaction (SAT), attitude (ATT), continuance intention (CI), and social influence (SI) which is represented in three dimensions. In all, 34 items were expected to load on eight factors, which it did (see Table 9). The results of the EFA show that each construct loaded on its own factor with no significant cross-loadings.

Each factor was next examined for reliability using Cronbach's alpha. The Cronbach's alpha values for the component factors are all greater than .86, yielding acceptable results. The reliability results are displayed at the bottom of Table 8. Convergent and discriminant validity were assessed for the mediating variables. Convergent validity is evident for the mediating variables through their factor loadings of greater than 0.5 on the same component. Discriminant validity is evident for the mediating variables through the absence of significant cross-loadings with other components.

Table 9. First EFA on Mediating Variables

Items	Components*							
	1	2	3	4	5	6	7	8
SNC3	0.918							
SCN2	0.887							
SNC4	0.851							
SNC1	0.837							
ATT3		0.810						
ATT4		0.801						
ATT2		0.738						
ATT1		0.722						
ATT5		0.646						
SAT3			0.862					
SAT4			0.833					
SAT2			0.824					
SAT1			0.749					
SNI2				0.877				
SNI3				0.877				
SNI1				0.844				
SNI4				0.843				
PU3					0.839			
PU4					0.839			
PU5					0.734			
PU2					0.610			
PU1					0.541			
IMG3						0.858		
IMG4						0.842		
IMG2						0.821		
IMG1						0.808		
HE3							0.745	
HE2							0.717	
HE4							0.654	
HE1							0.628	
CI3								0.790
CI1								0.613
CI4								0.612
CI2								0.598

*** item loadings of less than 0.3 suppressed**

SNC: Social Influence (Subjective Norm – Conformity
SNI: Social Influence (Subjective Norm – Influence)
IMG: Social Influence (Image)
ATT: Attitude toward using
SAT: Satisfaction
PU: Perceived Usefulness
HE: Hedonic Enjoyment
CI: Continuance Intention

Table 10. Final EFA on Mediating Variables

Items	Components*							
	1	2	3	4	5	6	7	8
SNI3	0.884							
SNI2	0.883							
SNI4	0.850							
SNI1	0.848							
SNC3		0.918						
SNC2		0.881						
SNC4		0.855						
SNC1		0.831						
SAT3			0.865					
SAT4			0.837					
SAT2			0.820					
SAT1			0.740					
IMG3				0.861				
IMG4				0.849				
IMG2				0.825				
IMG1				0.813				
ATT3					0.812			
ATT4					0.796			
ATT2					0.754			
ATT1					0.741			
PU4						0.842		
PU3						0.835		
PU5						0.746		
CI1							0.771	
CI2							0.770	
CI4							0.745	
HE2								0.796
HE3								0.762
HE1								0.746
Mean	3.654	6.039	5.453	3.132	5.054	4.669	5.490	5.253
Eigenvalues	3.532	3.531	3.444	3.343	3.043	2.465	2.339	2.309
Variance expl'd	12.18%	12.18%	11.88%	11.53%	10.49%	8.5%	8.07%	7.96%
Cronbach's α	0.960	0.927	0.934	0.914	0.869	0.886	0.893	0.925

The dependent variable for this study is post-adoptive use (PAU). There are seven items that are expected to load on one factor. The results of the first run of exploratory factor analysis are shown in Table 11.

Table 11. Final EFA on Dependent Variable

Items	**Components**
	1
PAUI1	0.909
PAUI2	0.905
PAUI3	0.901
PAUFR2	0.854
PAUD	0.793
PAUFR1	0.756
PAUE	0.724
Mean	3.985
Eigenvalue	4.913
Variance explained	70.18%
Cronbach's alpha	0.928

PAUI: Post-Adoptive Use (Intensity)
PAUFR: Post-Adoptive Use (Frequency)
PAUD: Post-Adoptive Use (Duration)
PAUE: Post-Adoptive Use (Extent)

The EFA was expected to show loadings on one factor, which it did. The results of the EFA show that the single construct loaded adequately on own factor with no significant cross-loadings. Reliability of the dependent variable using Cronbach's alpha was acceptable, with an alpha value of over .9. Convergent validity is evident through the factor loading of greater than 0.5 on the single factor.

Structural Equation Modeling

The structural equation modeling tool LISREL was used to create measurement models for the confirmatory factor analysis (CFA) on the constructs, and for the model to test the proposed hypotheses. As a first step, the multi-dimensional variables for social capital, and social influence were reduced to a single measurement item for each second-order factor by averaging the values for each item into a composite score. Thus, the four items that measured bonding were averaged to form one value to serve as one of three measurements, along with

bridging and maintained, so that social capital is now measured by three items and acts as a first-order construct. The same process was performed for the social influence construct, so that it now is measured by three items made up of the composite scores of image, influence, and conformity respectively. Also, composite scores were created for two aspects of the dependent variable, post-adoptive use. Seven items were used to measure post-adoptive use, but one item measured feature use, one item measured duration of use, three items measured intensity of use, and two items measured frequency of use. The multi-item measures for intensity and frequency were averaged to form a composite individual item for each respective measurement, to avoid weighting post-adoptive use too heavily on either intensity or frequency. For the structural equation model, post-adoptive use is measured by four items with equal weight: features, intensity, frequency, and duration.

Measurement Models

Measurement models were created for the exogenous and endogenous variables. Each measurement model describes the relationship of observed variables to their corresponding latent variables. This is accomplished by assessing the reliability and validity of the measures (Komiak & Benbasat 2006; Tenenhaus, Vinzi, Chatelin, & Lauro 2005). Thus, CFA was conducted on the measurement models in order to assess the measures.

Two measurement models were created, one with all exogenous variables (X-model), and one with all endogenous variables (Y-model). The models are shown in Figure 12 and Figure 13. Convergent validity can be assessed by examining the composite reliability and the average variance extracted (AVE) of the constructs (Barclay et al. 1995; Hu, Lin, Whinston, & Zhang 2004; Komiak & Benbasat 2006). The AVE represents the amount of variance explained by the indicators of a construct relative to the amount of variance captured as a result of the

measurement error (Chin 1998; Hu et al. 2004; Komiak & Benbasat 2006). The results of the item loadings and the AVE values for each construct are shown in Table 12 and Table 13.

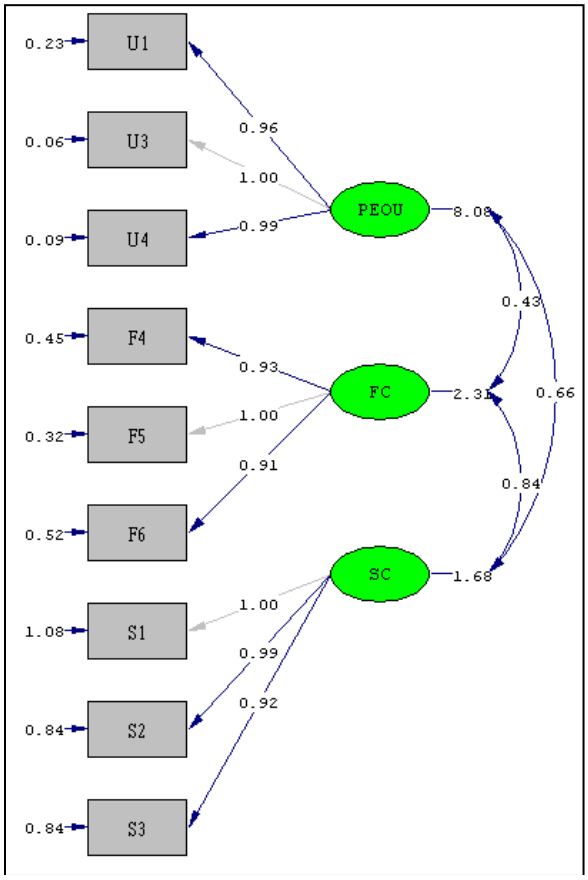

Figure 12. All X measurement model.

Table 12. CFA for All X Model

Constructs & Indicators	Completely Standardized Loading	t-statistics	Average Variance Extracted	Composite Reliability
PEOU			**0.983**	**0.994**
PEOU1	0.98	38.38		
PEOU3	1.00	39.26		
PEOU4	0.99	39.08		
FC			**0.830**	**0.936**
FC4	0.90	32.16		
FC5	0.94	34.14		
FC6	0.89	31.19		
SC			**0.634**	**0.839**
SC1	0.78	23.88		
SC2	0.82	25.28		
SC3	0.79	24.42		

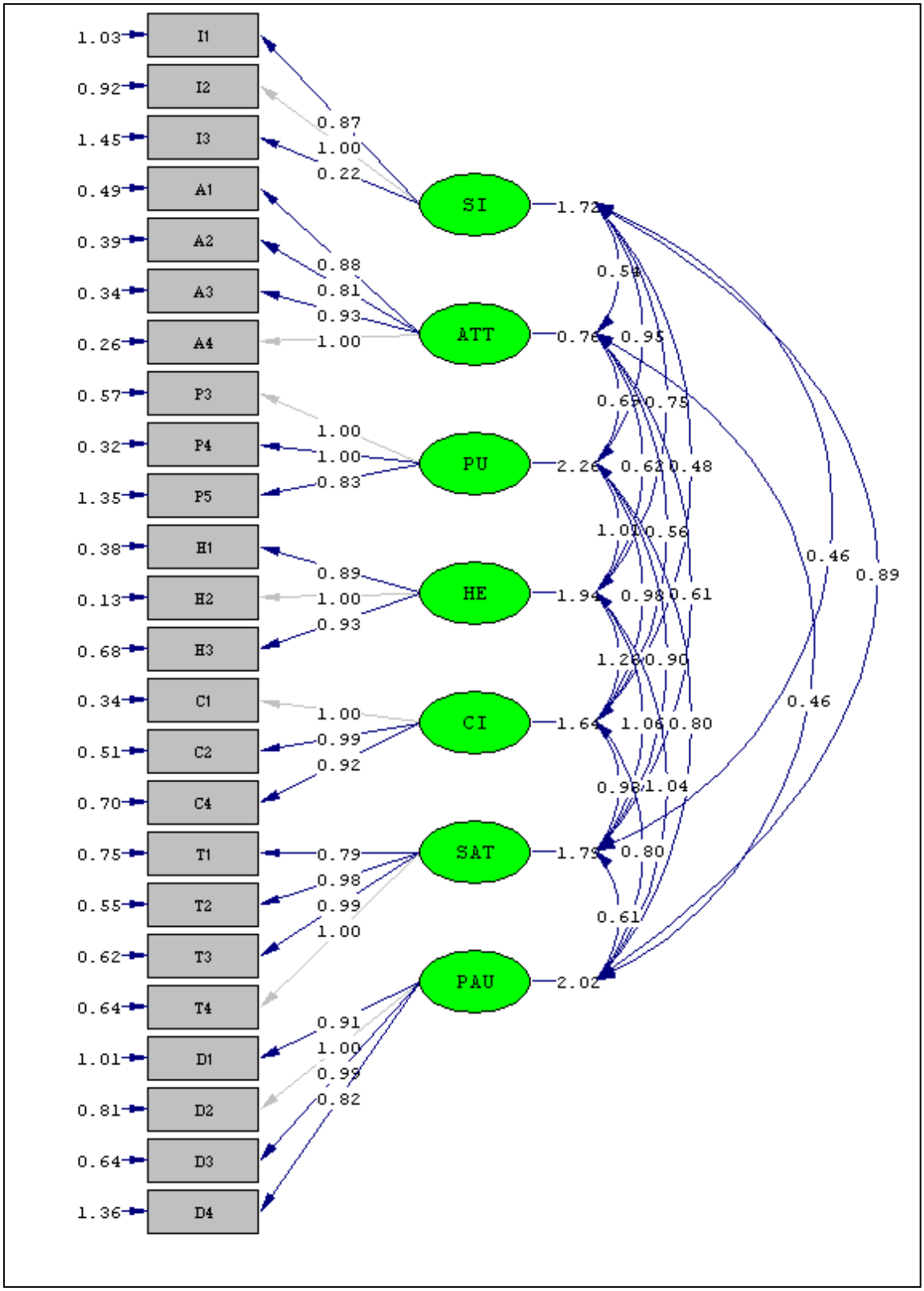

Figure 13. All Y measurement model.

Table 13. First CFA for All Y Model				
Constructs & Indicators	**Completely Standardized Loading**	**t-statistics**	**Average Variance Extracted**	**Composite Reliability**
SI			**0.422**	**0.648**
I1	0.75	20.16		
I2	0.81	21.75		
I3	0.23	5.86		
ATT			**0.629**	**0.871**
A1	0.74	23.14		
A2	0.75	23.47		
A3	0.81	26.55		
A4	0.86	29.00		
PU			**0.737**	**0.892**
P3	0.89	30.98		
P4	0.94	33.31		
P5	0.73	23.20		
HE			**0.817**	**0.930**
H1	0.90	31.86		
H2	0.97	36.49		
H3	0.84	28.98		
CI			**0.749**	**0.899**
C1	0.91	32.01		
C2	0.87	29.93		
C4	0.81	26.98		
SAT			**0.709**	**0.907**
T1	0.77	25.04		
T2	0.87	29.94		
T3	0.86	29.38		
T4	0.86	29.32		
PAU			**0.648**	**0.880**
D1	0.79	25.48		
D2	0.84	28.13		
D3	0.87	29.39		
D4	0.71	21.78		

Recommended AVE values should be greater than 0.5 for an adequate measurement model. The AVE value for the social influence construct falls below that threshold. The indicator with the least path weight (SI3) was removed to improve the AVE. The results of the

CFA after the removal of SI3 are shown in Table 14. All AVE scores now show as greater than 0.6 which is above the recommended value.

Table 14. Final CFA for All Y Model

Constructs & Indicators	Completely Standardized Loading	t-statistics	Average Variance Extracted	Composite Reliability
SI			**0.607**	**0.755**
I1	0.75	20.01		
I2	0.81	21.39		
ATT			**0.629**	**0.871**
A1	0.74	23.14		
A2	0.75	23.47		
A3	0.81	26.54		
A4	0.86	29.00		
PU			**0.737**	**0.892**
P3	0.89	30.97		
P4	0.94	33.31		
P5	0.73	23.20		
HE			**0.817**	**0.930**
H1	0.90	31.86		
H2	0.97	36.49		
H3	0.84	28.98		
CI			**0.749**	**0.899**
C1	0.91	32.01		
C2	0.87	29.93		
C4	0.81	26.99		
SAT			**0.709**	**0.907**
T1	0.77	25.04		
T2	0.87	29.94		
T3	0.86	29.38		
T4	0.86	29.31		
PAU			**0.648**	**0.880**
D1	0.79	25.47		
D2	0.84	28.11		
D3	0.87	29.41		
D4	0.71	21.79		

Composite reliability is a way to measure internal consistency of constructs. The recommended composite reliability value for an adequate model is 0.7 or higher per construct

(Barclay et al., 1995; Chin, 1998; Fornell & Larcker, 1981; Komiak & Benbasat, 2006). All composite reliability scores for all constructs are higher than 0.75.

Discriminant validity can be assessed by evaluating the relationship between the square root of the AVE for a construct and that construct's correlation with other latent variables (Chin, 1998; Fornell & Larcker, 1981; Gefen & Straub, 2005; Komiak & Benbasat, 2006). Adequate discriminant validity is achieved if the square root of the AVE for a construct is greater than the correlation of that construct with any other latent variable, giving evidence that the variance shared by the construct and its indicators is greater than the variance shared with other constructs (Fornell & Larcker, 1981; Komiak & Benbasat, 2006). The results of the discriminant validity assessments are shown in Table 15 and Table 16. The tables show that the square root of AVE for all constructs is greater than the correlations among the constructs (the square root of the AVEs is found on the diagonal line). Thus, adequate discriminant validity between constructs exists.

Table 15. Discriminant Validity for All X Model

	Composite Reliability	AVE	PEOU	FC	SC
PEOU	0.994	0.983	**0.992**		
FC	0.936	0.830	0.100	**0.911**	
SC	0.839	0.634	0.180	0.430	**0.796**

(Square root of AVE is on the diagonal)

Table 16. Discriminant Validity for All Y Model

	Composite Reliability	AVE	SI	ATT	PU	HE	CI	SAT	PAU
SI	0.755	0.607	**0.779**						
ATT	0.871	0.629	0.450	**0.793**					
PU	0.892	0.737	0.460	0.530	**0.858**				
HE	0.930	0.817	0.380	0.510	0.480	**0.904**			
CI	0.899	0.749	0.250	0.500	0.510	0.710	**0.866**		
SAT	0.907	0.709	0.240	0.520	0.450	0.570	0.570	**0.842**	
PAU	0.880	0.648	0.470	0.370	0.370	0.530	0.440	0.320	**0.805**

(Square root of AVE is on the diagonal)

Full Structural Model

With the measurement models completed, the highest coefficient of each construct was noted from the path diagram of both the X and Y models. A full structural model was run using the LISREL structural equation modeling tool, including both endogenous and exogenous variables, and the highest coefficient of each construct from the measurement models was set to 1 to establish the metric of each scale. To obtain a better fit with the data, it was necessary to allow the error variance between measurement items T4 and T3 (satisfaction) to freely correlate. These measures of satisfaction had similar lower bounds with extreme descriptions of "disgusted" and "frustrated," while the other measures were milder ("displeased" and "dissatisfied"), so the correlation makes sense (Diefendorff, Croyle and Gosserand 2005). The path diagram of the full model run is shown in Figure 14.

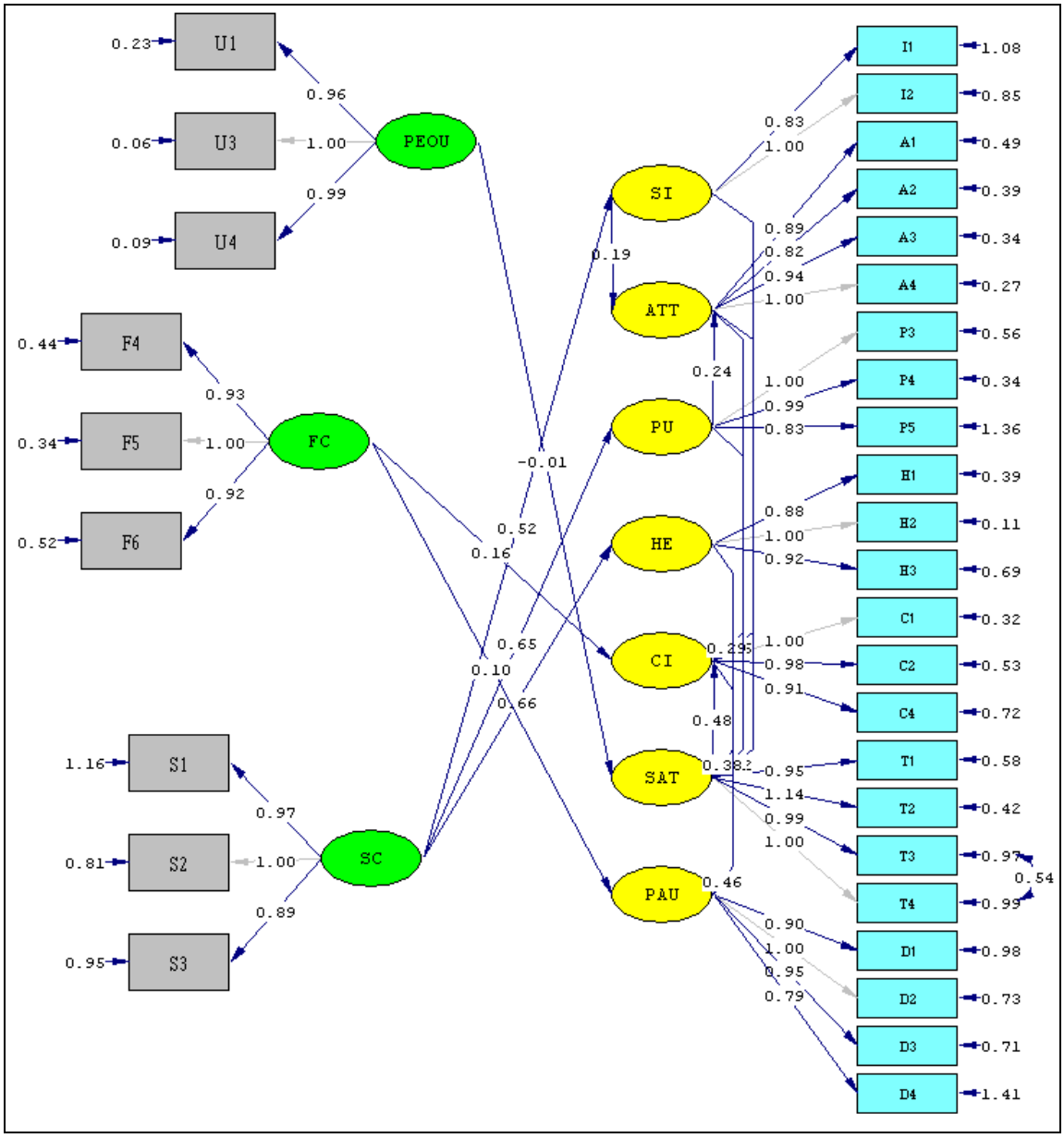

Figure 14. Path diagram of full structural model.

The fit indices and other relevant statistics regarding the model fit were examined. Table 17 shows the fit indices of the full structural model run as well as the recommended statistical values for good model fit established by published and cited works.

Table 17. Comparative Fit Indices for Initial Full Structural Model								
	$\chi 2/df$	RMSEA	GFI	AGFI	CFI	NFI	NNFI	PGFI
All X Model	2.093	0.034	0.99	0.97	1.00	0.99	0.99	0.53
All-Y Model	4.281	0.065	0.91	0.88	0.98	0.97	0.98	0.69
Full Model	**3.624**	**0.058**	**0.89**	**0.86**	**0.97**	**0.97**	**0.97**	**0.75**
Recommended Value	≤5.0	≤0.1	≥0.9	≥0.8	≥0.9	≥0.9	≥0.9	≥0.5
Recommended by Authors	Bollen 1989	Byrne 2001	Simon & Paper 2007	Simon & Paper 2007	Simon & Paper 2007	Simon & Paper 2007	Simon & Paper 2007	Chang et al (n.d.)

The table shows that most of the full structural model fit indices fall within the recommended values, indicating a good fit. The chi-square value for the full model is 1612.46 with 445 degrees of freedom. In many circumstances, the chi-square value divided by the degrees of freedom can serve as a fit indicator, with values less than or equal to 3 indicating adequate model fit (Simon & Paper, 2007). However, the chi-square statistic is very sensitive to sample size, in many situations making it unclear whether the statistical significance of the chi-square is due to poor fit or sample size (Stevens, 1996). Because of this, it has been recommended in situations where the sample size is large enough to falsely inflate the chi-square statistic that the chi-square be divided by the degrees of freedom, and if the result is less than 5, model fit can be considered acceptable (Bollen, 1989). Because the sample size in this study approaches 800, this approach was taken. The chi-square divided by the degrees of freedom is 3.624 in the full model, below the recommended threshold of 0.5, indicating adequate fit. The goodness of fit index (GFI) value is 0.89, which is slightly below the 0.9 recommended by literature. The GFI and adjusted goodness of fit (AGFI) indexes are designed to give an assessment of fit that is less sensitive to sample size than the chi-square statistic (Stapleton, 1997). However, there is still an indirect effect due to the effect of N on sampling distributions (Hair et al. 2006). While the GFI is slightly below the acceptable threshold, the AGFI is safely above, even though AGFI penalizes more complex models (Hair et al., 2006). The comparative fit index (CFI), non-normed fit index

(NNFI), and root mean square error of approximation (RMSEA) are also less sensitive to large sample sizes (Morris, Waldo, Rothblum, 2001), and all of those indices were well within acceptable levels. Overall, the model is considered a good fit.

An additional test of the fit of the hypothesized model was performed by comparing it against an alternate model (also known as a saturated model) in which paths from all latent variables were specified to all other latent variables, with the caveat that exogenous latent variables were not the recipients of any paths. If the paths specified in the hypothesized model are truly the better fit for the data, then the saturated model which includes all realistic paths should ***not*** have better fit indicators than the full structural model. The saturated model, however, would not converge without the removal of several important paths, indicating that the hypothesized model was a better fit.

Full Model Analysis

The full structural model with paths and standardized structure coefficients is shown in Figure 15.

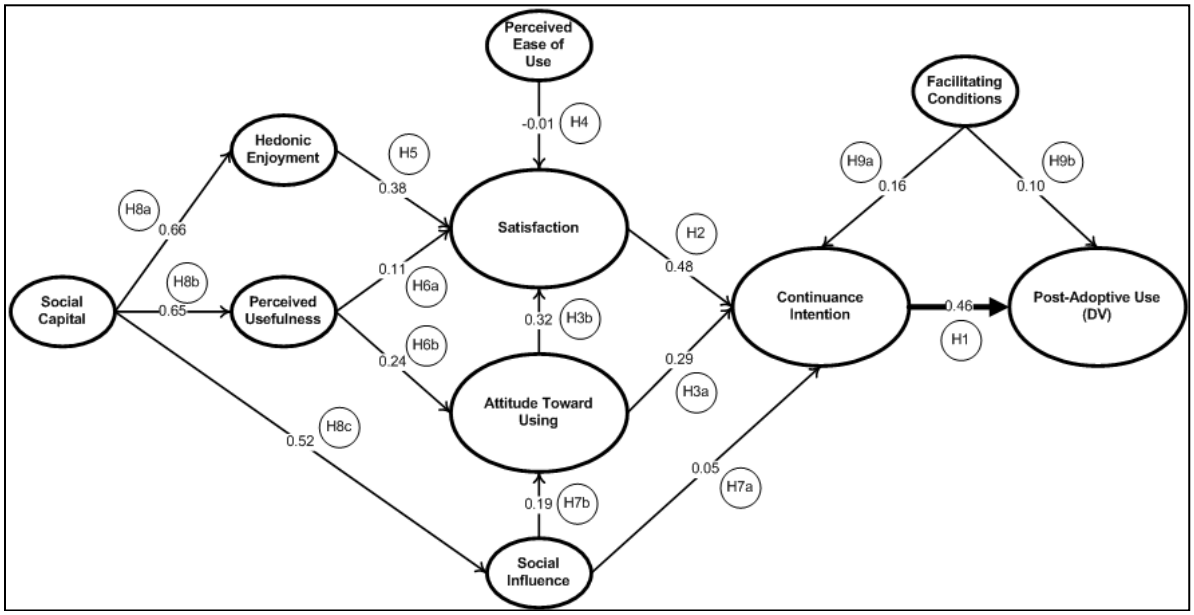

Figure 15. Full structural model with standardized coefficients.

The estimate weight is shown for each arrow connecting a latent construct with a corresponding latent construct it is hypothesized to affect. All paths were hypothesized to yield positive associations. Perceived ease of use had a negative and insignificant association with satisfaction ($\beta = -0.01$, $\tau = -0.79$, $p = 0.215$). Social influence had a positive but insignificant (at the 0.05 level) association with continuance intention ($\beta = 0.05$, $\tau = 1.37$, $p = 0.086$). The rest of the paths reflected positive and significant associations between latent constructs. Continuance intention was positively associated with the dependent variable of post-adoptive use ($\beta = 0.46$, $\tau = 9.99$, $p = 0.000$). Facilitating conditions was positively associated with post-adoptive use ($\beta = 0.10$, $\tau = 2.86$, $p = 0.002$) and continuance intention ($\beta = 0.16$, $\tau = 5.82$, $p = 0.000$). Satisfaction was positively associated with continuance intention ($\beta = 0.48$, $\tau = 11.36$, $p = 0.000$), as was attitude ($\beta = 0.29$, $\tau = 4.99$, $p = 0.000$). Hedonic enjoyment was positively associated with satisfaction ($\beta = 0.38$, $\tau = 12.41$, $p = 0.000$) as was perceived usefulness ($\beta = 0.11$, $\tau = -3.41$, $p = 0.001$). Perceived usefulness was positively associated with attitude ($\beta = 0.24$, $\tau = 11.38$, $p = 0.000$). Likewise, attitude was positively associated with satisfaction ($\beta = 0.32$, $\tau = 5.78$, $p = 0.000$). Social influence was positively associated with attitude ($\beta = 0.19$, $\tau = 6.90$, $p = 0.000$). Social capital was positively associated with hedonic enjoyment ($\beta = 0.66$, $\tau = 16.83$, $p = 0.000$), perceived usefulness ($\beta = 0.65$, $\tau = 14.31$, $p = 0.000$), and social influence ($\beta = 0.52$, $\tau = 11.33$, $p = 0.000$).

The relationships hypothesized in this study are illustrated in Table 18.

Table 18. Hypothesis Support		
H#	**Hypothesized Relationship**	**Supported**
H1	*Continuance intention* will have a positive effect on *post-adoptive use.*	Yes
H2	User *satisfaction* will have a positive effect on the user's *continuance intention.*	Yes
H3a	*Attitude toward using* will have a positive effect on the user's *continuance intention.*	Yes
H3b	*Attitude toward using* will have a positive effect on the user's *satisfaction.*	Yes
H4	*Perceived ease of use* will have a positive effect on user *satisfaction.*	No
H5	*Hedonic enjoyment* will have a positive effect on user *satisfaction.*	Yes
H6a	*Perceived usefulness* will have a positive effect on user *satisfaction.*	Yes
H6b	*Perceived usefulness* will have a positive effect on *attitude toward using.*	Yes
H7a	*Social influence* will have a positive effect on a user's *continuance intention.*	No*
H7b	*Social influence* will have a positive effect on a user's *attitude toward using.*	Yes
H8a	*Social capital* will have a positive effect on a user's *hedonic enjoyment.*	Yes
H8b	*Social capital* will have a positive effect on the *perceived usefulness* of the SNA	Yes
H8c	*Social capital* will have a positive effect on the *social influence* a user experiences	Yes
H9a	*Facilitating conditions* will have a positive effect on a user's *continuance intention.*	Yes
H9b	*Facilitating conditions* will have a positive effect on a user's *post-adoptive use.*	Yes

* significant at 0.1 (p = 0.086)

All hypothesized relationships were supported in the full structural model, with the exception of the relationship between perceived ease of use and user satisfaction, and the relationship between social influence and attitude toward using.

Common methods bias (CMB) is a possibility in this study due to the same method being used to collect data from the population. Published studies vary in their assessment of CMB as an issue (i.e. Podsakoff, MacKenzie, Lee & Podsakoff 2003; Crampton & Wagner 1994; Doty & Glick 1998; Spector 1987; 2006), but several researchers suggest the presence of common assessment methods does not necessarily result in large or problematic CMB (Meade, Watson & Kroustalis 2007), and even if CMB is present it does not necessarily jeopardize the validity of study conclusions (Meade et al. 2007; Doty & Glick 1998; Spector 2006). Common methods

bias was assessed through three methods: Harman's one-factor test (Podsakoff & Organ 1986), confirmatory factor analysis (Bock, Sabherwal & Qian 2008), and the common method factor test (Podsakoff et al. 2003). In Harman's one-factor test, all the measuring items were entered together into a principal components factor analysis and the results of the unrotated factor solution were examined. The presence of substantial common method variance should result in either a single factor emerging, or in one general factor accounting for most of the co-variance (Podsakoff & Organ 1986). The results yielded 11 factors, with the first factor explaining 36.1% of the variance. The remaining factors explained 43% of the variance. No general factor was apparent in the unrotated factor solution. In the second test, confirmatory factor analysis was performed in LISREL including all measuring items, with each latent construct linked to the items measuring it. The square root of the average variance extracted for each construct was found to exceed the correlation with other constructs. The final test was the common method factor test performed in LISREL. In this test, a single latent variable was added to the model, and all measurement items mapped as indicators of the added latent variable. If common method bias was significant, the fit indices of the model with the latent factor mapped to the measurement items should be comparable or better than the full structural model. The model with the common method factor would not converge without a reduction of paths, indicating that it was not a better fit than the full structural model. The results of all three tests suggest that common methods bias was not a significant problem in this study.

Alternate Model Analysis

Because of the disagreement in literature regarding whether attitude is an antecedent to satisfaction, or whether satisfaction is an antecedent to attitude, an alternate model was run to investigate the model with satisfaction being the antecedent to attitude and all other relationships the same.

The end result was a slightly better fit than the original model; the chi-square dropped from 1612.46 to 1585.89, the AGFI indicator increased by one-hundredth of a point (from 0.86 to 0.87), and the RMSEA decreased by one-thousandth of a point (from 0.058 to 0.057). Some relationships were slightly strengthened while others were slightly worsened, but all relationships were supported or not supported in the same manner as the original model.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

This dissertation explored the use of a social networking application called Facebook, with the object of testing a predictive model that would illustrate factors associated with post-adoptive usage. This chapter presents a discussion of the findings. It also identifies the study's limitations, and identifies contributions to research and application design. Finally, it offers suggestions regarding the direction of future research on social networking applications.

Discussion of Findings

A theoretical model for predicting post-adoptive use of social networking applications was proposed, and tested by a sample of Facebook users. The model consisted of 10 constructs. Two of those were second-order constructs, and each of those was made up of three first-order constructs respectively. Each construct and the findings relevant to it are discussed in this section.

Post-adoptive use was operationalized with measures of duration, frequency, intensity, and extent in an attempt to develop a more robust measure of system usage than TAM models have traditionally sought. The findings in this study showed that the ability and empowerment of users to utilize the application, as well as their intention to do so are key factors that may be used in predicting post-adoptive use.

Continuance intention is the immediate antecedent to post-adoptive use in the model. The findings show that the lack of perceived limitations (facilitating conditions) was a partial predictor for the user's intention to continue using their social networking application. This is an indication that the user's understanding of the limitations that would prevent them from using Facebook affects their intention to continue using it. These limitations include having the

available time to use Facebook, and the ability to get help from others when it is needed in order to effectively use or troubleshoot Facebook. Also, the user's satisfaction with their SNA and their attitude toward using their SNA were both found to have predictive power on the user's intention to continue using their SNA. The relationship between satisfaction and intention to continue is well established through expectation-confirmation theory (Bhattacherjee 2001), and simply reflects the understanding that people who are satisfied with something have generally had their expectations met and are likely to continue using it. Attitude toward using, as has been previously discussed, is related to satisfaction but encompasses the user's long-term feelings about the system beyond simply their experiences while using it. In a certain manner, it serves as a counter-balance to the measure of satisfaction as it relates to continuance intention. For example, a single bad experience might influence the measure of a user's satisfaction with Facebook, especially if it recently occurred and is fresh on their mind. However, that same experience may not affect the measure of a user's attitude toward using because the length and breadth of the user's feelings about Facebook transcend the history of their experiences, the totality of their feelings about Facebook may encourage them to overcome multiple bad experiences and continue using it.

Facilitating conditions served as an independent variable that positively affected both post-adoptive use and continuance intention. During the model's formation, the measuring items that dealt with technological availability and skill as facilitating conditions were not found to correlate with other conditions such as time availability, the availability of technological help, and the availability of other sources of help to assist the user in effectively operating their SNA. This is likely due to the respondents being post-adoptive users, and as such having less of a likelihood to be limited by technology or skill from an application they have already adopted and

continuously use.

User satisfaction was found to be a strong antecedent to continuance intention, reflecting the understanding that satisfied users are likely to continue using an application that works for them. Additionally, attitude, hedonic enjoyment, and perceived usefulness all were positive predictors of user satisfaction. It was theorized during the planning stage of this study that SNAs would act in some ways as hedonic information systems, and this prediction is supported through the relationship between hedonic enjoyment and user satisfaction. However, since a SNA also has utilitarian characteristics, it is not surprising that perceived usefulness also has predictive power, reflecting the idea that users are satisfied with an application that is useful to them and not just fun to use.

Perceived ease of use (PEOU) did not offer any significant correlation with user satisfaction. In previous technology use studies PEOU has had significant predictive power. The fact that it doesn't in this study may be due in part to the post-adoptive respondents and the nature of the Facebook application, since people who have adopted Facebook simply may not have much trouble using the application.

Attitude toward using served as a predictor of continuance intention and user satisfaction as expected from its past uses in studies.

Social influence was one of the multi-dimensional constructs, in this case being made up of three measures: image, social norm influence, and social norm conformity. In the structural model, social norm conformity ended up not correlating well with the other two measures. The items that measured social conformity asked the user to agree/disagree with the following statements: "Many of my friends use my SNA," "Many people I know use my SNA in some form or fashion," "A lot of people use my SNA," and "My SNA is very popular." In hindsight,

these questions suffer from a common problem in that they ask things the respondent may not know. A user may or may not know the extent of all their friends' use of the same SNA. The user may or may not know the extent of their SNA's popularity or usage by other people. Therefore, this construct may still be valid for future post-adoptive models, but the measure used in this study was incapable of measuring it. Social influence made up of the remaining two measures was not a significant predictor of intention to continue, but did show predictive power regarding the user's attitude toward using. It is interesting that social influence was not significant in predicting continuance intention. The remaining dimensions of social influence essentially measure the effect of peer pressure from influential peers, and the brand image of the SNA in question. The fact that these two aspects of social influence do not influence the intention to continue in this study may be somewhat reflective of the fact that SNA usage generally takes place in private, and that it requires a level of preparation (i.e., registering and activation), and thus is less likely to be an activity that a person can be easily coerced into because of the level of action involved. That being said, social influence did have predictive power on the user's attitude toward using. So while peer pressure and brand image may not directly result in intention to use, the results of this study suggest that these social influences do make the user more disposed toward using a SNA.

Hedonic enjoyment proved to be the strongest predictor of user satisfaction, which likely reflects the nature of Facebook as at least a partially hedonic information system.

Social capital proved to be a strong predictor of hedonic enjoyment, perceived usefulness, and social influence. This reflects the social nature and purpose of SNAs such as Facebook. A SNA is useful for connecting with others socially, maintaining long distance relationships, and strengthening weak relational ties -- all aspects of social capital.

Study Objectives

At the beginning of this dissertation, several objectives were put forth. The following section discusses if and how they have been met.

Three research objectives were presented:

1. To examine past and present research into technology adoption, post-adoptive use, and SNA technology, and determine a set of key constructs applicable to the measurement of post-adoptive SNA use
2. To develop and test a theoretical model that is effective in predicting the post-adoptive use of SNA technology
3. To establish an instrument of measurement that is effective for constructs pertaining to SNA use

The first research objective was met through the literature review section, and the formation of constructs for the research instrument. The second research objective was met through the formation and analysis of the full structural model used to test the hypotheses with post-adoptive use as the dependent variable. The third research objective was partially met through the research instrument used to measure the variables for the model. Tests for reliability and validity of the instrument were undertaken throughout the research process, and while the final measures used are not identical to the ones proposed, the remaining measures have been shown to be effective for measuring constructs pertaining to SNA use.

Limitations

The findings of this study must be tempered with the acknowledgement of its limitations. There are several limitations that have the possibility to affect the accuracy of the presented findings.

As is common with all sample surveys, this study is subject to sampling error. Sampling errors occur due to the difficulty experienced by the researcher in gaining access to potential respondents that accurately represent the target population to be sampled (Braverman 1996). This study sampled university students in a class-based setting that resulted in the respondents being from a narrow age range and from primarily business-oriented majors. This population may not be representative of all SNA users, and therefore caution should be taken when generalizing the results to any other population.

The population was also limited to being from primarily a North American English-speaking culture, and the surveys were all administered in English only. While some international students were assuredly involved, the majority of respondents were from a single location and cultural identity. Again, caution should be taken when generalizing the results to any other population.

The measuring items for the social capital dimension of maintained social capital rely primarily on the user's relationship with high school friends. While this measure is reasonable for college students in the United States, it may be less effective if applied to other populations.

Contributions to Research

At the beginning of this study, several expected contributions were put forth. The following section discusses if and how they have been met.

This dissertation was expected to contribute to academic research in the following ways:

(1) It extends previous literature on the post-adoptive usage of technology into the realm of social networking computing applications

(2) It provides a theoretical model that can be used and extended in future research on social networking, online communities, and social software

(3) It defines new constructs that affect SNAs and that may prove valuable for further research on social media

(4) It introduces an established instrument for measurement of SNA usage factors to the field

Post-adoptive use studies have looked at many technologies, but as of the writing of this dissertation, none have focused on social networking application usage. This study therefore serves as an early contributor to the literature on post-adoptive use of SNAs. The second contribution is met by the establishing and testing of the full structural model. This model can be used in its current form to test other social network applications, or modified to fit SNAs with different characteristics, such as blogs or wikis, or different environments such as social networking sites inside organizational structures. The introduction of the model furthers the field of research into social networking applications and provides a foundation for departure into related research on other social media. The third contribution is met through the use of the instrument, and the assessment of the items and latent constructs for measuring aspects of SNA usage. The specific constructs post-adoptive use, social influence, and hedonic enjoyment are new versions of older concepts developed specifically for this study. Through the pilot study and the primary research instrument, all constructs were tested and refined, resulting in statistically accurate measures of the latent variables. Researchers of SNAs should find value in the reported hypothesized relationships and construct definitions for their own studies. The fourth contribution is met by the accompanying instrument (Appendix) which has been tested for validity and reliability through the process of this research. The measuring items detailed in the instrument are assessable according to the results of this study and can be used immediately to

study similar phenomena, or adapted according to the research needs of investigators of related phenomena.

Contributions to Practice

This dissertation was expected to contribute to industry practice in the following ways:

(1) It provides a model which is a first step toward understanding the relationships between the factors that influence post-adoptive usage of SNAs, which may be important for organizations who are pursuing commercial utilization of online social networking with their customers and within their organization

(2) it identifies and provides an assessment of critical factors affecting post-adoptive usage of SNAs that is valuable for those designing or configuring SNAs

The first contribution is met through the establishing of the full structural model, which illustrates the relationships between the various factors. Organizations that desire to understand things such as why their employees gravitate toward using SNAs at work, or how much a factor like social capital might influence the usefulness of a proposed new system, should find the results of this study useful. A potential use of this study in an organizational setting might be to help develop an understanding of the degree to which the various latent variables are positively associated with other latent variables, and using that understanding to increase usage of internal systems. For example, the model reveals that social capital has a very strong relationship with hedonic enjoyment, perceived usefulness, and social influence. Organizations desiring to utilize social networking applications to increase collaboration or a sense of community among their employees should recognize from the results of this study the importance of cultivating certain aspects of social capital in order to increase the level of enjoyment and usefulness experienced by the users of the system.

The second objective is met through the constructs established and modeled in the study. Organizations looking to either design new SNAs for use by the public or their employees can use the constructs collected in this study as a foundation in their exploration to find the factors that influence people to adopt and become regular users of a social networking application. The assessment of the users of other kinds of SNAs using the provided instrument can also illustrate which factors are most important for the post-adoptive use of a particular SNA. The model path loadings show the strength of the relationships between the latent constructs which provide valuable knowledge to developers regarding what aspects carry the most weight toward promoting continued use.

Future Research

Future research building on this study should include a continuous refinement process by which the instrument is made more parsimonious through fewer scale items, which the goal of making it more effective in measuring the constructs it purports to measure. During the study process, several of the initial measurement items that performed poorly were dropped to facilitate parsimony and more reliable measures. Applying the survey instrument to users of other SNAs beside Facebook may result in a further reduction in measurement items and a more accurate scale.

Another application of this study that furthers knowledge on SNAs is the potential administration of the survey to other groups of respondents. There is a demographic of SNA users that are older persons who use SNAs to communicate with family. Many people of college age who are working in industry also use SNAs while at work. Testing the survey's predictive power on different groups of respondents may reveal whether or not there are effective moderators that should be added, or whether there are missing constructs that might offer more

explanatory power over the existing instrument. Besides age, other factors of interest include location (region, country, etc.), culture, organizational environment, gender, level of income, and educational background.

The post-adoptive usage construct was designed to reflect a greater degree of usage (i.e. "deep usage") than previous studies have used. Yet it is still in the middle of the Burton-Jones & Straub (2006) usage continuum. Finding a better measure of system usage would greatly enhance the accuracy of future inversions of this model.

Concluding Remarks

This study set out to provide a predictive model for post-adoption of social networking applications. Through the lens of past acceptance and post-adoption literature, a predictive model was formulated, tuned, and tested, and was found to have predictive power among university students using SNA technology. This study demonstrates that the critical factors of social capital, hedonic enjoyment, perceived usefulness, social influence, attitude toward using, and satisfaction all influence a user's intention to continue using a social networking application, which in turn influences the user's post-adoptive use of SNAs, in the absence of limiting conditions.

APPENDIX

SURVEY INSTRUMENT

1) Have you ever used a SNA (Social Networking Application)? (Yes, No)

2) Are you currently using a SNA at least once every several weeks? (Yes, No)

3) Please give the name of the SNA you use most often (the SNA you choose will be hereafter referred to as "your SNA" or "my SNA" in future questions): _____

4) Please rate your experience level using your SNA: (7 pt.; “little or no experience” to “lots of experience”)

5) How long have you been using your SNA (number of years) : ____

6) How long have you been using your SNA (number of months): ____

IMAGE

7) (IMG1) People who use my SNA have more prestige than those who do not. (7pt; sa/sd)
8) (IMG2) Using my SNA enhances my reputation. (7pt; sa/sd)
9) (IMG3) People who use my SNA are held in higher regard than those who do not. (7pt; sa/sd)
10) (IMG4) Using my SNA enhances a person's status. (7pt; sa/sd)

SUBJECTIVE NORM (INFLUENCE)

11) (SNI1) People who are important to me encourage the use of my SNA. (7pt; sa/sd)
12) (SNI2) People whom I admire encourage the use of my SNA. (7pt; sa/sd)
13) (SNI3) People whom I respect encourage the use of my SNA. (7pt; sa/sd)
14) (SNI4) People who have an influence on me encourage the use of my SNA. (7pt; sa/sd)

SUBJECTIVE NORM (CONFORMITY)

15) (SNC1) Many of my friends use my SNA. (7pt; sa/sd)
16) (SNC2) Many people I know use my SNA in some form or fashion. (7pt; sa/sd)
17) (SNC3) A lot of people use my SNA. (7pt; sa/sd)
18) (SNC4) My SNA is very popular. (7pt; sa/sd)

ATTITUDE

19) (ATT1) Fill in the blank in the following sentence: Using my SNA is a(n) _____ idea (7pt.; “extremely foolish” to “extremely wise”)
20) (ATT2) Fill in the blank in the following sentence: Using my SNA yields _____ results. (7pt; “extremely negative” to “extremely positive”)
21) (ATT3) Fill in the blank in the following sentence: Using my SNA is _____ . (7pt; “extremely harmful” to “extremely beneficial”)
22) (ATT4) Fill in the blank in the following sentence: Using my SNA is a(n) _____ idea (7pt; “extremely bad” to “extremely good”)
23) (ATT5) Fill in the blank in the following sentence: Using my SNA delivers a(n) _____ experience. (7pt; “extremely unfavorable” to “extremely favorable”)

PERCEIVED USEFULNESS

24) (PU1) Using my SNA helps me accomplish my personal goals. (7pt; sa/sd)
25) (PU2) I consider my SNA to be useful. (7pt; sa/sd)
26) (PU3) Using my SNA allows me to accomplish the things I use it for quicker than if I did not use a SNA at all. (7pt; sa/sd)
27) (PU4) Using my SNA allows me to accomplish the things I use it for more effectively than if I didn't use a SNA at all. (7pt; sa/sd)
28) (PU5) Using my SNA allows me to do things I couldn't do if I did not use a SNA at all. (7pt; sa/sd)

PERCEIVED EASE OF USE

29) (PEOU1) Working with my SNA is neither complex nor difficult. (7pt; sa/sd)
30) (PEOU2) It is easy for me to become more skillful using my SNA. (7pt; sa/sd)
31) (PEOU3) I find my SNA easy to use. (7pt; sa/sd)
32) (PEOU4) Learning to operate my SNA interface is easy for me. (7pt; sa/sd)

HEDONIC ENJOYMENT

33) (HE1) My SNA is fun to use (7pt; sa/sd)
34) (HE2) Using my SNA gives me a sense of enjoyment (7pt; sa/sd)
35) (HE3) Using my SNA makes me feel good (7pt; sa/sd)
36) (HE4) I am disappointed when I have to stop using my SNA (7pt; sa/sd)

FACILITATING CONDITIONS

37) (FC1) I have the technology available to me to use my current SNA when I want to. (7pt; sa/sd)
38) (FC2) I have the knowledge and skills necessary to use my current SNA. (7pt; sa/sd)
39) (FC3) I have the available time to use my current SNA when I want to. (7pt; sa/sd)
40) (FC4) I have access to people or online resources that assist me with learning how to operate and use my current SNA. (7pt; sa/sd)
41) (FC5) I have access to people or online resources that assist me with technological difficulties with my current SNA. (7pt; sa/sd)
42) (FC6) If I need help using my current SNA, I have access to people or online resources that are effective in assisting me. (7pt; sa/sd)

CONTINUANCE INTENTION

43) (CI1) I intend to continue using my current SNA rather than discontinue its use (7pt; sa/sd)
44) (CI2) I plan to continue using my current SNA rather than replace it with an alternative non-SNA application, such as e-mail, voice telephony, etc. (7pt; sa/sd)
45) (CI3) If I could, I would like to discontinue my use of my current SNA (reverse coded) (7pt; sa/sd)
46) (CI4) I would like to continue using my current SNA for the forseeable future. (7pt; sa/sd)

SATISFACTION (How do you feel about your overall experience of using your current SNA?)

47) (SAT1) Very dissatisfied / Very satisfied (7pt.)
48) (SAT2) Very displeased / Very pleased (7pt.)
49) (SAT3) Very frustrated / Very contented (7pt.)
50) (SAT4) Absolutely disgusted / Absolutely delighted (7pt.)

SOCIAL CAPITAL - BONDING

51) (SCBO1) There is someone on my SNA I can turn to for advice about making very important decisions. (7pt; sa/sd)

52) (SCBO2) There are people on my SNA I trust to help solve my problems. (7pt; sa/sd)
53) (SCBO3) When I feel lonely, there are people on my SNA I can talk to. (7pt; sa/sd)
54) (SCBO4) The people I interact with on my SNA would help me fight an injustice. (7pt; sa/sd)

SOCIAL CAPITAL - BRIDGING

55) (SCBR1) Interacting with people on my SNA makes me curious about places other than where I live. (7pt; sa/sd)
56) (SCBR2) Interacting with people on my SNA makes me interested in what people who are different than me are thinking. (7pt; sa/sd)
57) (SCBR3) Interacting with people on my SNA makes me feel like part of a larger community. (7pt; sa/sd)
58) (SCBR4) While using my SNA, I often come in contact with new people. (7pt; sa/sd)

SOCIAL CAPITAL - MAINTAINED

59) (SCM1) I'd be able to find out about events in another town from a high school classmate living there. (7pt; sa/sd)
60) (SCM2) If I needed to, I could ask a high school classmate to do a small favor for me. (7pt; sa/sd)
61) (SCM3) I would be able to find information about a job or internship from a high school acquaintance. (7pt; sa/sd)
62) (SCM4) It would be easy to find people to invite to my high school reunion. (7pt; sa/sd)
63) (SCM5) I'd be able to stay with a high school acquaintance if traveling to a different city. (7pt; sa/sd)

POST-ADOPTIVE USE

64) (PAU) On average, how many hours do you use your current SNA each week? (7pt; “0-1” to “20+”)
65) (PAUFR1) On average during a one-week period, how many times do you access or use your current SNA? (7pt; “0-1” to “50 or more”)
66) (PAUFR2) How often would you say you use your SNA? (7pt; “not very often” to “very often”)
67) (PAUI1) How would you classify the intensity of your involvement experience with your SNA during a typical usage session? (7pt; “very low involvement” to “very high involvement”)
68) (PAUI2) How would you classify the intensity of your immersion into the world of your SNA in a typical usage session? (7pt; “very low immersion” to “very high immersion”)
69) (PAUI3) How would you classify the intensity of your engagement with your SNA in a typical usage session? (7pt; “very low engagement” to “very high engagement”)
70) (PAUE) How many of the available features of your SNA would you say you use? (7pt; “very few features” to “very many features”)

DEMOGRAPHICS

71) What is your age in years? (7pt; “20 or under” to “over 50”)
72) What is your gender? (M/F)
73) You are currently: (“undergraduate student”, “master’s student”, “doctoral student”, “other”)
74) Your major is: (List of business majors; includes “other”)
75) Your family's annual income is: (7pt; “<30k” to “>120k”)

REFERENCE LIST

Adler, P., & Kwon, S. (2002). “Social Capital: Prospects for a New Concept,” *Academy of Management Review*, 27(1), pp. 17–40.

Agarwal, S., and Mital, M. "An Exploratory Study of Indian University Students’ Use of Social Networking Websites: Implications for the Workplace," *Business Communication Quarterly* (72:1), 03/2009, pp.105-110.

Ahuja, M.K., and Thatcher, J.B. "Moving Beyond Intentions and Toward the Theory of Trying: Effects of Work Environment and Gender on Post-Adoption Information Technology Use," *MIS Quarterly* (29:3) 2005, p. 427.

Al-Natour, S., and Benbasat, I. "The Adoption and Use of IT Artifacts: A New Interaction-Centric Model for the Study of User-Artifact Relationships," *Journal of the Association for Information Systems* (10:9) 2009, p 661.

Acquisti, A., and Gross, R. "Imagined Communities: Awareness, Information Sharing, and Privacy on the Facebook," *Lecture Notes in Computer Science* (4258) 2006, pp.36-58.

Alavi, M., and Henderson, J.C. "An Evolutionary Strategy for Implementing a Decision Support System," *Management Science* (27:11) 1981, pp.1309-1323.

Anonymous "NAFSA Launches Presence on Facebook," *International Educator* (17:4), Jul/Aug 2008, p 5.

Armstrong, J.S., and Overton, T.S. "Estimating Nonresponse Bias in Mail Surveys," *Journal of Marketing Research (JMR)* (14:3) 1977, pp.396-402.

Arthur, D., Sherman, C., Appel, D., and Moore, L. "Why Young Consumers Adopt Interactive Technologies," *Young Consumers* (7:3), 2006 2006, p 33.

Bailey, D.S., and Zanders, E.D. "Drug Discovery in the Era of Facebook--New Tools for Scientific Networking," *Drug Discovery Today* (13:19-20), 2008/10 2008, pp.863-868.

Baker-Eveleth, L., Eveleth, D.M., and Sarker, S. "An Emerging On-Line "Third Place" For Information Systems (IS) Students: Some Preliminary Observations.," *Journal of Information Systems Education* (16:4), 2005///Winter2005 2005, pp. 465-475.

Beer, D. "Social Network(ing) Sites... Revisiting the Story So Far: A Response to danah boyd & Nicole Ellison," *Journal of Computer-Mediated Communication* (13:2) 2008, pp.516-529.

Benbasat, I., and Barki, H. "Quo Vadis, TAM?," *Journal of the Association for Information Systems* (8:4) 2007, pp.212-218.

Bhattacherjee, A. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (25:3) 2001, pp.351-370.

Bhattacherjee, A., and Premkumar, G. "Understanding Changes in Belief and Attitude Toward Information Technology Usage: A Theoretical Model and Longitudinal Test," *MIS Quarterly* (28:2) 2004, pp.229-254.

Bock, G., Sabherwal, R. and Qian, Z. "The Effect of Social Context on the Success of Knowledge Repository Systems," *IEEE Transactions on Engineering Management*, (55:4), 2008, pp. 536-551.

Bolar, K.P. "Motives Behind the Use of Social Networking Sites: An Empirical Study.," *ICFAI Journal of Management Research* (8:1), 2009/01// 2009, pp.75-84.

Bollen, K. *Structural Equations with Latent Variables*. New York, NY: Wiley, 1989.

Bouman, W., Hoogenboom, T., Jansen, R., Schoondorp, M., de Bruin, B., and Huizing, A. "The Realm of Sociality: Notes on the Design of Social Software," *ICIS 2007 Proceedings*) 2008, p. 154.

boyd, d.m., and Ellison, N.B. "Social Network Sites: Definition, History, and Scholarship," *Journal of Computer-Mediated Communication* (13:1) 2007, pp. 210-230.

Brown, J., Broderick, A.J., and Lee, N. "Word of Mouth Communication Within Online Communities: Conceptualizing the Online Social Network.," *Journal of Interactive Marketing (John Wiley & Sons)* (21:3), 2007///Summer2007 2007, pp. 2-20.

Bruque, S., Moyano, J., and Eisenberg, J. "Individual Adaptation to IT-Induced Change: The Role of Social Networks.," *Journal of Management Information Systems* (25:3), 2008///Winter2008 2008, pp.177-206.

Bumgarner, B.A. "You Have Been Poked: Exploring the Uses and Gratifications of Facebook Among Emerging Adults," *First Monday* (12:11), November 5, 2007 2007.

Burton-Jones, A., and Straub, D. "Reconceptualizing System Usage: An Approach and Empirical Test," *Information Systems Research* (17:3) 2006, pp.228-246.

Campbell, Donald R. and Donald W. Fiske. "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix," *Psychological Bulletin*, 56 (1959), pp. 81-105.

Cardon, P.W. "Online Social Networks," *Business Communication Quarterly* (72:1), 2009/03// 2009, pp.96-97.

Cheng, D., Yang, D., Han, J., & Song, Y. "An Empirical Research of Successful ERP Implementation Based on TAM", *Research and Practical Issues of Enterprise Information Systems II Volume 1*, Springer: Boston, 2008.

Chiu, C.-M., Hsu, M.-H., and Wang, E.T.G. "Understanding Knowledge Sharing in Virtual Communities: An Integration of Social Capital and Social Cognitive Theories," *Decision Support Systems* (42:3) 2006, pp.1872-1888.

Churchill Jr, G.A. "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research (JMR)* (16:1) 1979, pp.64-73.

Connell, R.S. "Academic Libraries, Facebook and MySpace, and Student Outreach: A Survey of Student Opinion," *Libraries and the Academy (9:1), 2009 2008, p 12.*

Cooper, R. B., and Zmud, R. W. "Information Technology Implementation Research: A Technological Diffusion Approach," *Management Science* (36:2), February 1990, pp. 123-139.

Crampton, S. M., & Wagner, J. A. "Percept-percept Inflation in Microorganizational Research: An Investigation of Prevalence and Effect," *Journal of Applied Psychology*, 79, 1994, pp. 67-76.

Doty, D. H., & Glick, W. H. "Common Methods Bias: Does Common Methods Variance Really Bias Results?", *Organizational Research Methods*, 1, 1998, pp. 374-406.

Cronbach, L. J.. "Coefficient Alpha and the Internal Structure of Tests". *Psychometrika,* 16, 1951, pp. 297-334.

Davis, F.D. "A Technology Acceptance Model for Empirically Testing New End-user Information Systems : Theory and Results," Thesis - Massachusetts Institute of Technology, Sloan School of Management, *1986.*

Davis, F.D. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly* (13:3) 1989, pp.319-340.

Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science* (35:8) 1989, pp.982-1003.

Davis, F.D., and Venkatesh, V. "Toward Preprototype User Acceptance Testing of New Information Systems: Implications for Software Project Management," *IEEE Transactions on Engineering Management* (51:1), Feb. 2004 2004, pp.31-46.

DeKay, S. "Are Business-Oriented Social Networking Web Sites Useful Resources for Locating Passive Jobseekers? Results of a Recent Study," *Business Communication Quarterly* (72:1), 2009/03// 2009, pp.101-105.

DeLone, W.H., and McLean, E.R. "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1) 1992, pp.60-95.

Diefendorff, J. M., Croyle, M. H., and Gosserand, R. H. "The Dimensionality and Antecedents of Emotional Labor Strategies," *Journal of Vocational Behavior*, vol. 66, 2005, pp. 339-357.

DiMicco, J.M., and Millen, D.R. "Identity Management: Multiple Presentations of Self in Facebook," in: *Proceedings of the 2007 International ACM Conference on Supporting Group Work*, ACM, Sanibel Island, Florida, USA, 2007.

Donath, J., and Boyd, D. "Public Displays of Connection," *BT Technology Journal* (22:4) 2004, p. 71.

Drentea, P., and Moren-Cross, J.L. "Social Capital and Social Support on the Web: The Case of an Internet Mother Site," *Sociology of Health & Illness* (27:7) 2005, pp.920-943.

Dwyer, C., Hiltz, S.R., and Passerini, K. "Trust and Privacy Concern within Social Networking Sites: A Comparison of Facebook and MySpace," *Proceedings of the 13th Annual America's Conference on Information Systems*, 2007.

Ellison, N., Steinfield, C., and Lampe, C. "Spatially bounded online social networks and social capital: The role of Facebook," *Conference Papers -- International Communication Association* (2006).

Ellison, N.B., Steinfield, C., and Lampe, C. "The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites," *Journal of Computer-Mediated Communication* (12:4) 2007, pp.1143-1168.

Ellison, N.B., and Wu, Y. "Blogging in the Classroom: A Preliminary Exploration of Student Attitudes and Impact on Comprehension," *Journal of Educational Multimedia and Hypermedia* (17:1) 2008, p 99.

Enders, A., Hungenberg, H., Denker, H.-P., and Mauch, S. "The Long Tail of Social Networking: Revenue Models of Social Networking Sites," *European Management Journal* (26:3) 2008, pp.199-211.

Faul, F., Erdfelder, E., Lang, A.-G. and Buchner, A. "G*Power 3: A Flexible Statistical Power Analysis Program for the Social, Behavioral, and Biomedical Sciences," *Behavioral Research Methods* (39:2), 2007, pp. 175-191.

Fogel, J., and Nehmad, E. "Internet Social Network Communities: Risk Taking, Trust, and Privacy Concerns," *Computers in Human Behavior* (25:1), 2009/1 2009, pp.153-160.

Gefen, D., Karahanna, E., & Straub, D. W. (2003). "Trust and TAM in online shopping: An integrated model," *MIS Quarterly*, 27(1), pp. 51-90.

Gefen, D., & Straub, D. W. (2000). "The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of E-commerce Adoption," *Journal of the Association for Information Systems*, 1(8), pp. 1-28.

Goodhue, D. L., and Thompson, R. L. "Task-Technology Fit and Individual Performance," *MIS Quarterly* (19:2), June 1995, pp. 213-236.

Freeman, L.C. *The Development of Social Network Analysis: A Study in the Sociology of Science* Empirical Press, Vancouver, 2004.

Hair Jr., J.F., Black, W.C., Babin, B.J., Anderson, R.E., and Tatham, R.L. *Multivariate Data Analysis*, (Sixth ed.) Pearson Prentice Hall, Upper Saddle River: NJ, 2006.

Hargittai, E. "Whose Space? Differences Among Users and Non-Users of Social Network Sites," *Journal of Computer-Mediated Communication* (13:1) 2008, pp.276-297.

Hewitt, C. "Offices are open systems," *ACM Trans. Inf. Syst*. (4:3) 1986, pp.271-287.

Hinduja, S., and Patchin, J.W. "Personal Information of Adolescents on the Internet: A Quantitative Content Analysis of MySpace," *Journal of Adolescence* (31:1) 2008, pp.125-146.

Hogg, T., Wilkinson, D., Szabo, G., and Brzozowski, M. "Multiple Relationship Types in Online Communities and Social Networks," *Proceedings of the 2008 AAAI Spring Symposium on Social Information Processing, AAAI Press*) 2008.

Hsieh, J.P.-A., and Zmud, R.W. "Understanding Post-Adoptive Usage Behaviors: A Two-Dimensional View," *DIGIT Workshop* (2006).

Hsu, C. L. and Lin, J. C. (2008). "Acceptance of Blog Usage: The Roles of Technology Acceptance, Social Influence and Knowledge Sharing Motivation", *Information & Management*, 45, pp. 65-74.

Huber, G. "Organizational Information Systems: Determinants of Their Performance and Behavior," *Management Science* (28:2) 1982, pp.138-155.

Inkpen, A.C., and Tsang, E.W.K. "Social Capital, Networks, and Knowledge Transfer," *Academy of Management Review* (30:1) 2005, pp.146-165.

Ives, B., Olson, M.H., and Baroudi, J.J. "The Measurement of User Information Satisfaction," *Communications of the ACM*, (26:10) 1983, pp.785-793.

Jasperson, J. S., Carter, P. E., and Zmud, R. W. 2005. "A Comprehensive Conceptualization of the Post-Adoptive Behaviors Associated with IT-Enabled Work Systems," *MIS Quarterly*.(29:3), pp. 525-557.

Jessup, L. & Valacich, J. *Information Systems Today: Why IS Matters*. Prentice Hall: New Jersey, 2006.

Joinson, A.N. "Looking At, Looking Up or Keeping Up with People?: Motives and Use of Facebook," *Proceeding of the twenty-sixth annual SIGCHI conference on Human factors in computing systems*) 2008.

Karahanna, E., Straub, D.W., and Chervany, N.L. "Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs," *MIS Quarterly* (23:2) 1999, pp.183-213.

Kerlinger, F.N., and Lee, H.B. *Foundations of Behavioral Research*, (4th ed.) Harcourt-Brace, Orlando, 2000.

Kim, S.S., Malhotra, N.K., and Narasimhan, S. "Two Competing Perspectives on Automatic Use: A Theoretical and Empirical Comparison," *Information Systems Research* (16:4) 2005, pp.418-432.

Kim, S.S., and Son, J.-Y. "Out of Dedication or Constraint? A Dual Model of Post-Adoption Phenomena and its Empirical Test in the Context of Online Services," *MIS Quarterly* (33:1) 2009, pp.49-70.

Kitzinger, J. "Introducing Focus Groups," *British Medical Journal* (311), 29 July, 1995, pp. 299-302.

Kitzinger, J. "The Methodology of Focus Groups: The Importance of Interactions Between Research Participants," *Sociology of Health and Illness*, (16), 1994, pp. 103-121.

Kostova, T., and Roth, K. "Social Capital in Multinational Corporations and a Micro-Macro Model of Its Formation," *The Academy of Management Review* (28:2) 2003, pp.297-317.

Kuo, J.P., Lai, C.P., and Wang, C. "Social Participation and Life Satisfaction: From Youth's Social Capital Perspective," *Journal of American Academy of Business, Cambridge* (12:2) 2008, p 237.

Kwon, H. S. and Chidambaram, L. "A Test of the Technology Acceptance Model: The Case of Cellular Telephone Adoption", *Proceedings of the 33rd Hawaii International Conference on System Sciences, 2000.*

Kwon, T. H. and Zmud, R. W. "Unifying the Fragmented Models of Information Systems Implementation," in *Critical Issues in Informaiton Systems Research,* R. J. Boland and R. A. Hirschheim (Eds.), John Wiley & Sons, New York, 1987, pp. 225-251.

Lampe, C., Ellison, N. and Steinfield, C. "Changes in Use and Perception of Facebook," *Proceedings of the Computer Supported Cooperative Work Conference 2008, San Diego, California,* pp. 721-730.

Lange, P.G. "Publicly private and privately public: Social networking on YouTube," *Journal of Computer-Mediated Communication* (13:1) 2008, pp.361-380.

Lee, L. T-S.L., and Sukoco, B.M. "The Effects of Entrepreneurial Orientation and Knowledge Management Capability on Organizational Effectiveness in Taiwan: The Moderating Role of Social Capital," *International Journal of Management* (24:3) 2007, pp.549-572.

Lee, Y., K.A. Kozar and K.R.T. Larsen, "The Technology Acceptance Model: Past, Present, and the Future," *Communications of the AIS*, 12 (2003), pp. 752-780.

Lenhart, A. "Pew Internet Project Data Memo," *Pew Internet & American Life Project*, January 14, 2009 2009, Retrieved on July 15th from http://www.pewinternet.org/~/media//Files/Reports/2009/PIP_Adult_social_networking_data_memo_FINAL.pdf.pdf .

Leonard-Barton, D., and Deschamps, I. "Managerial Influence in the Implementation of New Technology," *Management Science* (34:10), October 1988, pp. 1252-1265.

Lockyer, L., and Patterson, J. "Integrating Social Networking Technologies in Education: A Case Study of a Formal Learning Environment," *Proceedings of the Eighth IEEE International Conference on Advanced Learning Technologies, 2008. ICALT '08.* (2008) 2008, pp.529-533.

Logan, G. D. "Automaticity and Cognitive Control," in *Unintended Thought*, J. S. Uleman and J. A. Bargh (Eds.), The Guilford Press, New York, 1989, pp. 52-74.

Lucas, M.M., and Borisov, N. "FlyByNight: Mitigating the Privacy Risks of Social Networking," in: *Proceedings of the 7th ACM workshop on Privacy in the Electronic Society*, ACM, Alexandria, Virginia, USA, 2008.

Luk, C., Yau, O., Sin, L., Tse, A., Chow, R., and Lee, J. "The Effects of Social Capital and Organizational Innovativeness in Different Institutional Contexts," *Journal of International Business Studies* (39:4) 2008, p 589.

MacCallum, R. C. & Hong, S. (1997). "Power Analysis in Covariance Structure Modeling Using GFI and AGFI". *Multivariate Behavioral Research,* 32, pp. 193-210.

Magro, M.J., Ryan, S.D., Sharp, J.H., and Ryan, K.A. "Using Social Networking for Educational and Cultural Adaptation: An Exploratory Study," *AMCIS 2009 Proceedings*, 2009.

Malhotra, Y. & Galletta, D. "Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation," *Proceedings of the 32nd Hawaii International Conference on System Sciences*, 1999.

Mangalaraj, G., Mahapatra, R., and Nerur, S. "Acceptance of Software Process Innovations - The Case of Extreme Programming," *European Journal of Information Systems*, (18:4), 2009/07/28/online 2009, p 10.

Mazer, J.P., Murphy, R.E., and Simonds, C.J. "I'll See You On "Facebook": The Effects of Computer-Mediated Teacher Self-Disclosure on Student Motivation, Affective Learning, and Classroom Climate," *Communication Education* (56:1) 2007, pp.1 - 17.

Meade, A. W., Watson, A. M., & Kroustalis, C. M. "Assessing Common Methods Bias in Organizational Research," *Paper presented at the 22nd Annual Meeting of the Society for Industrial and Organizational Psychology*, New York, 2007, April.

Mislove, A., Koppula, H.S., Gummadi, K.P., Druschel, P., and Bhattacharjee, B. "Growth of the Flickr Social Network," *Proceedings of the First Workshop on Online Social Networks*) 2008.

Mitchell, E., and Watstein, S.B. "The places where students and scholars work, collaborate, share and plan," *Reference Services Review* (35:4), 2007 2007, p 521.

Morin, D. "Announcing Facebook Connect," *Facebook Developer Blog*, Retrieved on August 30, 2009 from http://developers.facebook.com/news.php?blog=1&year=2008&month=5 , May 9, 2008.

Nahapiet, J. and Ghoshal, S. (1998) Social Capital, Intellectual Capital, and the Organizational Advantage. *The Academy of Management Review*, (23:2), pp. 242-266.

Newell, S., Tansley, C., and Huang, J. "Social Capital and Knowledge Integration in an ERP Project Team: The Importance of Bridging AND Bonding," *British Journal of Management* (15) 2004, p S43.

Nysveen, H., Pedersen, P., Thorbjornsen, H. "Intentions to Use Mobile Services: Antecedents and Cross-Service Comparisons," *Journal of the Academy of Marketing Science*, (33:3), 2005, pp. 330-346.

Ouellette, J. A., and Wood, W. "Habit and Intention in Everyday Life: The Multiple Processes by Which Past Behavior Predicts Future Behavior," *Psychological Bulletin* (124:1), July 1998, pp. 54-74.

Pasfield-Neofitou, S.E. "Creative Applications of Social Networking for the Language Learning Class.," *International Journal of Learning* (14:12), 2008/04// 2008, pp.235-239.

Pempek, T.A., Yermolayeva, Y.A., and Calvert, S.L. "College Students' Social Networking Experiences on Facebook," *Journal of Applied Developmental Psychology* (In Press, Corrected Proof), 2009.

Pfeil, U., Arjan, R., and Zaphiris, P. "Age Differences in Online Social Networking - A Study of User Profiles and the Social Capital Divide Among Teenagers and Older Users in MySpace," *Computers in Human Behavior* (In Press, Corrected Proof) 2008.

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., and Pahnila, S. "Consumer Acceptance of Online Banking: An Extension of the Technology Acceptance Model," *Internet Research* (14:3), 2004, pp.224-235.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology*, 88, 2003, pp. 879-903.

Podsakoff, P. M., and Organ, D. W. "Self Reports in Organizational Research: Problems and Prospects," *Journal of Management*, (12:4), 1986, pp. 531-544.

Portes, A. "Social Capital: Its Origins and Applications in Modern Sociology," *Annual Review of Sociology* (24:1) 1998, pp.1-24.

Preece, J. "Supporting Community and Building Social Capital," *Communications of the ACM* (45:4) 2002, pp.36-39.

Resnick, P. "Beyond Bowling Together: Sociotechnical Capital", In J. Carroll (Ed.), *HCI in the New Millennium* (pp. 247-272). Boston, MA: Addison-Wesley, 2001.

Richter, A., and Koch, M. "Functions of Social Networking Services," *Eighth International Conference on the Design of Cooperative Systems*, 2008.

Robert, L.P., Jr., Dennis, A.R., and Ahuja, M.K. "Social Capital and Knowledge Integration in Digitally Enabled Teams," *Information Systems Research* (19:3), September 1, 2008 2008, pp.314-334.

Ross, C., Orr, E.S., Sisic, M., Arseneault, J.M., Simmering, M.G., and Orr, R.R. "Personality and Motivations Associated with Facebook Use," *Computers in Human Behavior* (25:2), 2009/3 2009, pp.578-586.

Ryan, S.D. "Information Systems and Healthcare XXXVI: Building and Maintaining Social Capital–Evidence from the Field," *Communications of the Association for Information Systems*, (27), 2010, Article 18.

Saeed, K.A., and Abdinnour-Helm, S. "Examining the Effects of Information System Characteristics and Perceived Usefulness on Post Adoption Usage of Information Systems," *Information & Management* (45:6) 2008, pp.376-386.

Schonfeld, E. "Social Site Rankings for September, 2007," *Techcrunch.com* Retrieved on August 2, 2009 from http://www.techcrunch.com/2007/10/24/social-site-rankings-september-2007/ , October 24, 2007.

Schonfeld, E. "Top Social Media Sites of 2008 (Facebook Still Rising)," *Techcrunch.com.* Retrieved on August 2, 2009 from http://www.techcrunch.com/2008/12/31/top-social-media-sites-of-2008-facebook-still-rising/, December 31, 2008.

Schonfeld, E. "Facebook Is Now the Fourth Largest Site in the World," *Techcrunch.com* Retrieved on August 30, 2009, from http://www.techcrunch.com/2009/08/12/facebook-grew-twice-as-fast-as-twitter-in-july/, August 4, 2009.

Sharp, J.H. "Development, Extension, and Application: A Review of the Technology Acceptance Model," *Information Systems Education Journal* (5:9), May 16, 2007.

Snyder, J., Carpenter, D., and Slauson, G.J. "MySpace. com–A Social Networking Site and Social Contract Theory," *Information Systems Education Journal* (5:2), 2007, p 11.

Spector, P. E. "Method Variance as an Artifact in Self-reported Affect and Perceptions at Work: Myth or Significant Problem?" *Journal of Applied Psychology*, 72, 1987, pp. 438-443.

Spector, P. E. “Method Variance in Organizational Research: Truth or Urban Legend?”, *Organizational Research Methods*, 9, 2006, pp. 221-232.

Steinfield, C., Ellison, N.B., and Lampe, C. "Social Capital, Self-esteem, and Use of Online Social Network Sites: A Longitudinal Analysis," *Journal of Applied Developmental Psychology* (29:6), 2008/0 2008, pp.434-445.

Stevens, J. *Applied Multivariate Statistics for the Social Sciences*. (3rd edition). Mahwah, NJ: Lawrence Erlbaum Associates, 1996.

Straub Jr, D.W., and Burton-Jones, A. "Veni, Vidi, Vici: Breaking the TAM Logjam," *Journal of the Association for Information Systems* (8:4) 2007, pp.224-229.

Subrahmanyam, K., Reich, S.M., Waechter, N., and Espinoza, G. "Online and Offline Social Networks: Use of Social Networking Sites by Emerging Adults," *Journal of Applied Developmental Psychology* (29:6) 2008, pp.420-433.

Sykes, T.A., Venkatesh, V., and Gosain, S. "Model of Acceptance with Peer Support: A Social Network Perspective to Understand Employees' System Use," *MIS Quarterly* (33:2), June 2009, pp.371-393.

Tan, L. "Psychotherapy 2.0: MySpace® Blogging as Self-therapy," *American Journal of Psychotherapy* (62:2) 2008, p 143.

Taylor, D.G., and Strutton, D. "Has E-marketing Come of Age? Modeling Historical Influences on Post-Adoption Era Internet Consumer Behaviors," *Journal of Business Research* (In Press, Corrected Proof) 2009.

Thelwall, M. "Social Networks, Gender, and Friending: An Analysis of MySpace Member Profiles," *Journal of the American Society for Information Science and Technology* (59:8) 2008A, pp.1321-1330.

Thelwall, M. "How are Social Network Sites Embedded in the Web? An Exploratory Link Analysis," *Cybermetrics*, 2008B, p 1.

Thelwall, M. "Homophily in MySpace," *Journal of the American Society for Information Science and Technology* (60:2) 2009, pp.219-231.

Van der Heijden, H., “User Acceptance of Hedonic Information Systems”, *MIS Quarterly*, 24 (4), 2004, pp. 695-704.

Venkatesh, V., and Davis, F.D. "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science* (46:2) 2000, p 186.

Venkatesh, V., Morris, M.G., Davis, G.B., and Davis, F.D. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3) 2003, pp.425-478.

Venkatesh, V., Brown, S.A., Maruping, L.M., and Bala, H. "Predicting Different Conceptualizations of System Use: The Competing Roles of Behavioral Intention, Facilitating Conditions, and Behavioral Expectation," *MIS Quarterly* (32:3) 2008, pp.483-502.

Vijayasarathy, L.R. "Predicting Consumer Intentions to Use On-line Shopping: The Case for an Augmented Technology Acceptance Model," *Information & Management* (41:6) 2004, pp.747-762.

Wah, C.Y., Menkhoff, T., Loh, B., and Evers, H.-D. "Social Capital and Knowledge Sharing in Knowledge-Based Organizations: An Empirical Study," *International Journal of Knowledge Management* (3:1) 2007, p 29.

Walther, J.B., Van Der Heide, B., Hamel, L.M., and Shulman, H.C. "Self-Generated Versus Other-Generated Statements and Impressions in Computer-Mediated Communication: A Test of Warranting Theory Using Facebook," *Communication Research* (36:2), April 1, 2009, pp.229-253.

Wandel, T.L. "Colleges and Universities Want to be Your Friend: Communicating via Online Social Networking," *Planning for Higher Education* (37:1), Oct-Dec 2008, p 35.

Wang, S.C., Lii, Y.S., and Fang, K.T. "Predicting the Continuance Usage of Information Systems: A Comparison of Three Alternative Models," *WSEAS Trans. Info. Sci. and App.* (6:2) 2009, pp.301-318.

Warr, W.A. "Social Software: Fun and Games, or Business Tools?," *Journal of Information Science* (34:4), August 1, 2008, pp.591-604.

Waterman, A., Schwartz, S., and Conti, R. "The Implications of Two Conceptions of Happiness (Hedonic Enjoyment and Eudaimonia) for the Understanding of Intrinsic Motivation," *Journal of Happiness Studies* (9:1) 2008, pp.41-79.

Widen-Wulff, G., and Ginman, M. "Explaining Knowledge Sharing in Organizations Through the Dimensions of Social Capital," Journal of Information Science (30:5) 2004, p 448.

Williams, A.L., and Merten, M.J. "A Review of Online Social Networking Profiles by Adolescents: Implications for Future Research and Intervention," *Adolescence* (43:170), Summer 2008, p 253.

Williams, D. (2006). “On and Off the 'Net: Scales for Social Capital in an Online Era,” *Journal of Computer-Mediated Communication*, 11 (2), article 11. Retrieved October 26, 2009 from http://jcmc.indiana.edu/vol11/issue2/williams.html.

Wixom, B.H., and Todd, P.A. "A Theoretical Integration of User Satisfaction and Technology Acceptance," *Information Systems Research* (16:1) 2005, pp.85-102.

Wu, Y., Ryan, S.D., and Windsor, J. "Influence of Social Context and Affect on Individuals' Implementation of Information Security Safeguards," *Proceedings of the Thirteenth Annual Conference on Information Systems, Phoenix,* 2009.

Yuan, Y.C., and Gay, G. "Homophily of Network Ties and Bonding and Bridging Social Capital in Computer-Mediated Distributed Teams," *Journal of Computer-Mediated Communication* (11:4) 2006, pp.1062-1084.

Zhao, S., Grasmuck, S., and Martin, J. "Identity construction on Facebook: Digital empowerment in anchored relationships," *Computers in Human Behavior* (24:5), 2008/9, pp.1816-1836.