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THE ROLE OF COGNITIVE MODELING IN PREDICTING INTERNET USE

By

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ABSTRACT

THE ROLE OF COGNITIVE MODELING IN PREDICTING INTERNET USE

By

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Using the framework provide by Social Cognitive Theory (Bandura, 1986), this study examined the relationships among behavior, cognitive, and environmental events as mechanisms to Internet use. While prior research in this area focused primarily on the cognitive and behavioral components, this study extends this to incorporate environmental factors that influence the development of cognitive models of Internet use. Here, both personal and non-personal experiences within an individual's environment are examined as antecedents of Internet self-efficacy judgments. Results assessing individual relationships indicated that Internet self-efficacy was significantly related to prior Internet experience, friend's and parent's Internet use and Internet success, friends' and parent's Internet encouragement, social group success, media portrayals, social, personal and negative outcome expectancies, and Internet anxiety. Further, Internet use was significantly related to social, informational, entertainment, and negative outcome expectations, Internet self-efficacy and Internet anxiety. When using path analysis to test the direct and indirect theoretical relationships among these constructs, the data failed to fit the model. However, a new model identifying only substantial contributors was tested and found to be consistent with the data.

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Introduction

Research investigating the Internet has transitioned from basic questions regarding who and how many are online to why people are going online and with what effects. This shift has been led by research which suggests that being online increases an individual's level of social isolation (Nie & Embring, 2000), subsequently decreasing psychological well being. In addition to psychological effects, researchers also have begun to uncover a racial divide among Internet users (Hoffman, Novak, and Schlosser, 2000; NTIA, 1999). Initially, access was thought to be the only barrier to minority Internet use. However, recent findings also suggest that a lack of use by minorities could also be due to psychological barriers (Scholfield, Davidson, Stocks, & Fortman, in press).

Through the use of traditional models of media behavior such as Uses and Gratifications, communication scholars have laid the foundation to understanding motivations for Internet use (Charney & Greenberg, in press; Papacharissi & Rubin, 2000). In order to further this research, it is necessary to assess additional cognitive mechanisms that lead to the behavior of Internet use. To do this, Social Cognitive Theory as posited by Bandura (1986) was tested. Social Cognitive Theory (SCT) allowed for an investigation of the relationship among behavior, cognitive, and environmental events as interacting determinants of each other. Here, it was possible to investigate how internal reasoning as formed through enactive and vicarious learning as well as verbal persuasion affect behavior.

Therefore, through the framework of SCT, this study examines the interrelationships among outcome expectancies, self-efficacy judgments, previous

Internet experience, reference group Internet use, success and encouragement, social group success, media portrayals, Internet anxiety, and Internet use.

CHAPTER 1

Understanding Internet Usage

Our understanding of Internet users has progressed over the past several years, however, many important questions surrounding the decision to use the Internet remain unanswered. That said, this research evaluates how researchers have studied the Internet by discussing who and why people are going online. Further, using social cognitive theory, this study theoretically and empirically examines how internally formed perceptual models influence how and why people use the Internet.

Early research conducted to understand general computing technology use applied the theory of reasoned action as posited by Fishbein and Ajazen (1975). Reasoned action was the first theory to gain acceptance in understanding why people adopt information systems. This framework considers the beliefs that an individual has about a behavior and the actions taken from those beliefs. Specifically, the theory of reasoned action indicates that an individual would use an information system if they could associate positive benefits with use. While this approach has had success in predicting the use of computing technologies (Davis, Bagozzi, & Warsaw, 1989), later studies indicated that modifications to the model were needed. For example, by linking beliefs to emotion and future consequences (Triandis, 1980; Thompson, Higgins & Howell, 1991) as well as self-efficacy judgments (Compeau & Higgins, 1995) researchers have increased the ability to predict and understand the use of various information systems.

The latest information system to be subjected to investigations is the Internet. Currently, 51 percent of US households have at least one computer, and approximately 42 percent of them are connected to the Internet (NTIA, 2000); producing an estimated

104-million adult US Internet users (Pew Research Center, 2000). Of these, 30-million are under the age of 18. Further, 73 percent of those between the ages of 12 and 17 are active Internet users while 29 percent of those under the are of 12 have accessed the Internet at sometime. Overall, there are slightly more females (51%) on the Internet than males (49%).

The number one use of the Internet is email (Nie & Embring, 2000; Lubans, 1999; NTIA, 2000) with a reported 80 - 90% of all users engaging in this activity. Other top uses of the Internet include playing games, surfing, accessing databases and engaging in interpersonal activities such as discussion groups and chat rooms (Lubans, 1999; Nie & Embring, 2000). In addition to email use, information gathering also has been heralded as a primary use of the Internet (Lubans, 1999).

In an attempt to understand why people use the Internet, many researchers have applied traditional models of media behavior. Within the field of mass communication, Uses and Gratifications is the dominant paradigm for examining Internet use (Charney & Greenberg, in press; Kaye, 1996; Korgaonkar & Wolin, 1999; Lin, 1999; Papacharissi & Rubin, 2000). With its emphasis on active media use and its ability to explain both mass and interpersonal communication, uses and gratifications is a useful paradigm from which to begin assessing the Internet.

Kaye (1996) applied well-established gratification factors for television viewing to the Internet. She found moderate correlations between the amount of weekly Internet usage and entertainment, social interaction and escape gratifications. Korgaonkar and Wolin (1999) found that factors of escapism, information control, interactive control (relating to the ability to control the presentation of information), socialization and

economic motivation successfully distinguished between low and high Internet users. Further, Lin (1999) also identified motivations for using online services such as surveillance, companionship, identity, and entertainment as predictors of adoption.

In an attempt to give the Internet its own uses and gratifications personality, Charney and Greenberg (in press) and Papacharissi and Rubin (2000) found three common gratification factors for the Internet, keep informed, entertainment, and communication. Other factors included, (1) develop a new identity, (2) improve mood, (3) view aesthetically pleasing sights, (4) improve one's career status, (5) improve social standing (Charney & Greenberg, in press), (6) take up free time, and (7) make life easier (Papacharissi & Rubin, 2000).

The development of research investigating who goes online and why people go online has steadily advanced. As discussed, many psychologists and social scientists have used the theoretical framework of uses and gratifications. The uses and gratification model starts with individual needs, suggesting that in order to use a medium, an individual only has to deem it appropriate to fulfill its needs. However, the complex nature of using the Internet as well as information systems in general suggests that an evaluation of self-regulatory mechanisms that influence Internet use such as self-efficacy is essential.

Another route to understanding Internet use is through the investigation of social issues such as the digital divide. The digital divide or the difference that separates white, high income Internet users from minority, lower income non-users has been a primary topic of discussion among both policy makers (NTIA, 2000, 1999) and social scientists (Hoffman & Novak, 1998; Hoffman, Novak, & Schlosser, 2000). The digital divide has

been operationalized primarily in terms of race and class discrimination that is reflected in unequal access to computers and the Internet. Currently, the divide is still compelling with African American and Hispanic homes recording 23 percent penetration; compared to the 42 percent penetration nationally (NTIA, 2000). Further, only 19 percent of African Americans and 16 percent of Hispanics report actually using the Internet at home.

While the importance of socio-economic and racial factors cannot be denied, prospective Internet users also face psychological barriers. Research has indicated that new Internet users are less comfortable using the Internet, are less satisfied with their Internet skills and are more likely to encounter stress-inducing problem situations (GVU, 1999). So, while cost and lack of access are the most significant barriers to initial use of the Internet, uncertainty about initial use and the perception that computers are too complicated are also important components (Katz & Aspen, 1996).

The most convincing evidence of this can be seen in the classroom (Scholfield, 1997; Scholfield, Davidson, Stocks, & Fortman, in press). As mentioned, access is considered the primary barrier to minorities. However, when given access via the classroom, usage patterns tend to mimic general society. Here, higher levels of familiarity with computer applications (primarily due to home use) have caused Caucasians to dominate Internet use in technologically equipped classrooms. These findings have led researchers to begin considering Internet use from a cognitive perspective (Jackson, Barbatsis, Biocca, Fitzgerald, & VonEye, 2000).

Using the knowledge provided by the uses and gratification research, this study will expand current understanding of Internet use by framing the decision to use within

Social Cognitive Theory (Bandura, 1986). By doing so, psychological factors that influence internal perceptions and subsequent Internet use will be assessed. This type of investigation will provide a more encompassing picture of why people decide to use the Internet.

Applying Social Cognitive Theory (SCT)

Through numerous empirical investigations, SCT has provided social scientists with a model that enables the examination of individual behavior (Bandura, 1986). Using a triadic reciprocal causation model, SCT examines the relationships among behavior, cognitive, and environmental events as interacting determinants that influence each other bi-directionally (see Figure 1).

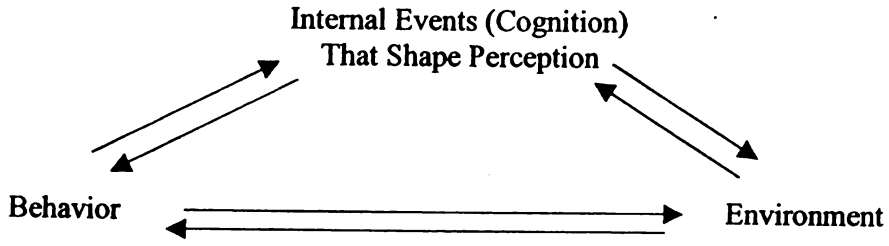


Figure 1. ***The triadic reciprocal causation model of human agency within Social Cognitive Theory.***

That is, (a) the environment in which an individual exists influences the internal events, which then affects the environment; (b) behavior in a given situation is affected by environmental elements, which are then affected by an individual's behavior; and (c) behavior is influenced by cognitive factors, which are influenced by the behavior. This

reciprocal relationship makes an individual both the product and producer of its environment.

From this perspective, Bandura (1994) characterizes human nature as "a vast potentiality that can be fashioned by direct and observational experience into a variety of forms within biological limits" (p. 62). Therefore, humans contain the inherent capability to examine a course of action, evaluate the consequences of that action against previously held judgments, and then modify existing judgments accordingly. The triadic model is mediated by these capabilities that transform sensory experiences into individual cognitive models of actions.

According to Bandura (1986), SCT includes a complex causal structure that establishes the development of competency and the regulation of action. Knowledge structures created represent cognitive strategies of effective action which guide behavior. These cognitive models afford individuals the ability to produce skills as wells as internal standards needed to proficiently execute a behavior. This cognitive guidance toward behavior is key in the developmental stages of a behavior. Understanding the importance in cognitive development as an influence of behavior, this study only focuses on the primary cognitive factors that influence individual behavior. That said, there are two prominent expectations guiding behavior within SCT, outcome and self-efficacy judgments (Bandura, 1986). Both outcome expectations and self-efficacy are conceptualized within the cognitive domain of SCT (see Figure 2).

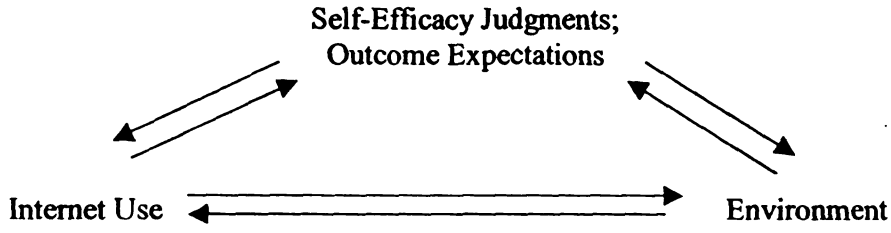


Figure 2: ***The incorporation of Internet use as behavior and outcome expectations and self-efficacy judgments as conceptualized in the triadic reciprocal causation model of human agency within Social Cognitive Theory.***

Internal Events That Shape Perception

Outcome Expectations are defined as the perceived likely consequences of performing a behavior (Bandura, 1997). While rewards are typically thought of as external (i.e., monetary rewards), SCT focuses on the idea that rewards are often internal. Two distinct types of outcome expectations are recognized in SCT: social and personal. Each form contains positive (i.e., incentives) and negative (i.e., disincentives) expectations. Positive social outcomes include positive social reaction of others, approval, social recognition, etc., while negative effects include items such as social rejection and disinterest. Positive personal outcomes establish self-satisfaction, pride, self-worth, etc., while negative outcomes produce self-dissatisfaction and self-devaluation (Bandura, 1997).

Past research evaluating outcome expectations has indicated that perceived usefulness of various information systems such as computers (Compeau, Higgins, & Huff, 1999; Davis, 1989; Thompson, Higgins, & Howell, 1991) increases use of that

technology. Both performance and personally based expectations of computer use were found to be significantly related. In terms of the Internet, social outcomes would derive from social encounters online, while personal outcomes would develop from online personal achievements, such as obtaining information or being entertained. Guided by Charney and Greenberg (in press), LaRose, Mastro, and Eastin (in press) assessed the relationship between outcome expectations and Internet use. They found that expected outcomes were significantly related to Internet use. Specifically, pleasing sensory, novel sensory, and social outcome expectations were identified as being positively related to Internet use, and negative outcomes as being negatively related to Internet use. Here, negative outcomes were defined as the likelihood of encountering negative effects associated with Internet use such as having your browser freeze-up and getting blocked by password protected sites.

Given these results, the outcome expectations identified by Bandura (1986; 1997), and the most common uses of the Internet (Lubans, 1999; Nie & Erbring, 2000), the following relationships between outcome expectations and Internet use are hypothesized:

H1 ***The higher the social outcome expectations, the higher the Internet use.***

H2 ***The higher the personal outcome expectations in informational and entertainment activities, the higher the Internet use.***

H3 ***The higher the negative outcome expectations, the lower the Internet use.***

The second component of internal judgments is self-efficacy. As a central component of SCT, self-efficacy is defined as the belief "in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997,

p. 3). This cognitive construct has long been recognized as an important determinant of individual behavior within SCT. Specifically, self-efficacy is a form of self-evaluation that influences decisions about what behaviors to undertake, the amount of effort and persistence put forth when faced with obstacles, and finally, the mastery of the behavior. Self-efficacy is not a measure of skill; rather, it reflects what an individual believes they can do with the skills they possess. Self-efficacy can be distinguishable from self-esteem, in that self-esteem is defined as the general belief in one's self-worth and general beliefs about oneself, while self-efficacy is specific to a particular behavior domain (i.e., Internet use). Furthermore, after compiling and assessing several experimental studies on self-efficacy, Bandura (1982) found perceived efficacy toward a given behavior to be a better predictor of behavior than past performance.

From an information technology view, the relationship between computer self-efficacy and computer use has been studied often (Burkhart & Brass, 1990; Compeau & Higgins, 1995; Oliver & Shapiro, 1993). Personal computers represent a complex and somewhat troublesome technology, requiring considerable skill and extensive training to operate successfully. Staying consistent with the concept of self-efficacy, Compeau and Higgins (1995) distinguished between component skills such as formatting disks and booting up the computer and behaviors individuals can accomplish with these skills, such as using software to analyze data.

Internet self-efficacy focuses on what a person believes can be accomplished online. It does not refer to a person's skill at writing HTML, using a browser, or transferring files. Instead, it assesses judgments of their ability to apply these types of skills in a more encompassing mode (e.g., finding information online). Using the Internet

requires a set of skills more advanced than those required by traditional computer use, which may be considered daunting to beginning users. These include establishing and maintaining a stable Internet connection, learning how to navigate on the Internet and how to search for relevant information. Thus, Internet self-efficacy may be distinguished from computer self-efficacy as the beliefs that one can successfully perform a distinct set of behaviors required to establish, maintain and effectively utilize the Internet over and above basic personal computer skills.

Early research on Internet self-efficacy focused on the performance of specific tasks such as entering World-Wide Web addresses, creating folders and bookmarks, mailing pages, using the File Transfer Protocol (FTP) and telnet, constructing a hypertext index, and moving bookmarks (Nahl, 1996; Nahl, 1997). Recently, researchers have evaluated the relationship between Internet self-efficacy and performance (Nahl, 1996; Nahl, 1997; Staples, Hulland, & Higgins, 1998) and prior use of the Internet (Eastin & LaRose, 2000). Results were consistent with previous self-efficacy literature, with self-efficacy perceptions positively related to task performance (Nahl, 1996; Nahl, 1997; Staples et al., 1998) and prior use (Eastin & LaRose, 2000).

People who have little confidence in their ability to use the Internet, or who are uncomfortable using the Internet may be said to have weak self-efficacy beliefs. According to SCT, those with low Internet self-efficacy should be less likely to use the Internet than those with high degrees of self-efficacy.

H4 ***The higher the Internet self-efficacy judgments, the higher the Internet use.***

In addition to the relationship between self-efficacy and Internet use, self-efficacy is also considered a causal antecedent to outcome expectations (see Figure 3). As previously stated, outcome expectations are defined as the perceived likely consequences of performing a behavior (Bandura, 1997). This relationship demonstrates the interplay among variables within the cognitive domain of SCT. Oliver and Shapiro (1993), found that the stronger a person's self-efficacy beliefs, the more likely they were to try to achieve the desired outcome, thus, supporting the persistence characteristic inherent to self-efficacy judgments. Furthermore, results from Compeau & Higgins (1995) analysis of computer use indicated that computer self-efficacy influenced expectations about the future outcomes of computer use such as job performance and personal accomplishment.

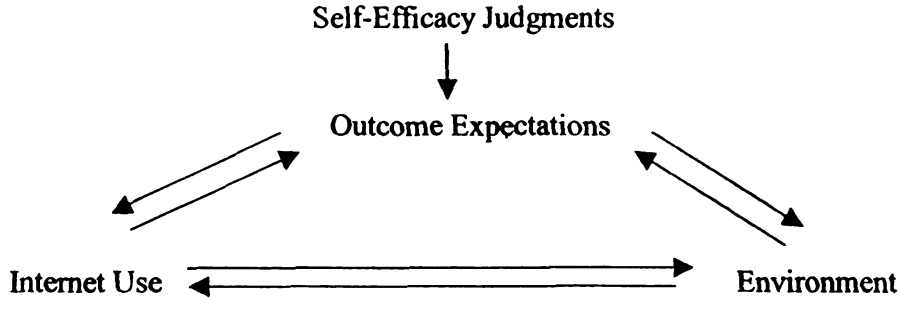


Figure 3: ***The relationship between self-efficacy judgments and outcome expectations as conceptualized within the cognitive domain.***

In an assessment of online outcomes, Eastin and LaRose (2000) found expectations such as informational to be significantly related to Internet self-efficacy. In the present context this means that Internet self-efficacy should be positively related to the expectation of positive outcomes from Internet use, such as obtaining useful information,

being entertained and social interactions. Conversely, negative outcome expectations are expected to be lower when Internet self-efficacy perceptions are high.

H5 ***The higher the Internet self-efficacy judgments, the higher the social outcome expectations.***

H6 ***The higher the Internet self-efficacy judgments, the higher the personal outcome expectations.***

H7 ***The higher the Internet self-efficacy judgments, the lower the negative outcome expectations.***

Social Environmental Factors

Individuals have the capacity of self-reflection. Through self-reflective means, individuals establish, maintain, and reconstruct cognitive models such as self-efficacy perceptions. People are able to understand causal relationships and increase their knowledge through personal and non-personal experiences within their environment. Hence, social factors within an individual's environment influence how cognitive models are developed. For example, when engaging in a behavior an individual develops a positive or negative model of the experience. The individual then uses this model to determine the extent of future participation. Social Cognitive Theory suggests that the thought verification process occurs within three modes, enactive, vicarious, and persuasive (see Figure 4).

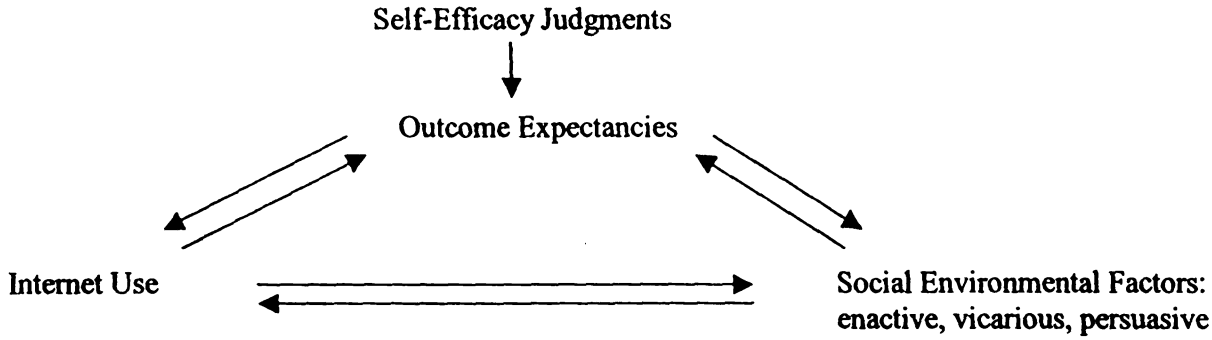


Figure 4: ***The implementation of social environmental factors of thought verification as conceptualized in the triadic reciprocal causation model of human agency within Social Cognitive Theory.***

Enactive influences are developed by an individual through actual experience with a behavior. Positive interactions reinforce and increase previous ability models, while negative interactions weaken previously constructed models. Past research has indicated prior experience as an important antecedent of self-efficacy (Lewis, 1985). For example, math skills are needed in computer programming, and math skills and number of math courses taken play an important role in individual judgments about their programming ability (Bandura, 1997; Oliver & Shapiro 1993). Research on computer self- efficacy supporting these findings indicates a significant positive relationship between computer self-efficacy and computer usage (Burkhart & Brass, 1990; Oliver & Shapiro, 1993).

The positive relationship between Internet use and Internet self-efficacy has been empirically validated (Eastin & LaRose, 2000; Staples, et al., 2000). Staples et al., (2000) found that direct experience with remote work environments increased remote work self-efficacy, while Eastin and LaRose (2000) indicated that past Internet use (e.g., number of months using the Internet) positively influence Internet efficacy judgments. Thus, the

following relationship between Internet experience and Internet self-efficacy is hypothesized:

H8 ***The greater the prior Internet experience, the greater the Internet self-efficacy.***

Vicarious learning allows an individual to shape cognitive models without physically participating in a specific behavior. The behavior and subsequent effects they observe can serve as a mechanism for which to compare previous interpretations. This modeling mechanism can be broken into three different areas, use by others, success of others and media portrayals. First, the influence of vicarious learning occurs when use observation occurs within an individual's reference group (Bandura, 1986). The behavior of an individual's reference group use is used to form and evaluate personal self-efficacy beliefs. Learning through observation has been established within SCT literature as a method individuals use to determine whether or not to participate in a given behavior (Compeau & Higgins, 1995; Manz & Sims, 1986; Schunk, 1981). According to Bandura (1997), the relationship between the influence of others' use and adoption of the behavior is mediated by self-efficacy. Given this, it is plausible to suggest that the amount of exposure an individual has to others being online will influence their Internet self-efficacy perceptions.

More specifically, research indicates that these effects are stronger when the individuals being observed are in a person's reference group (Bandura, 1986). An individual's reference group consists of people from whom the individual seeks guidance (Bandura, 1986; Cross, 2000). Here, it is hypothesized:

H9 ***The higher Internet use is within the reference group, the greater the level of Internet self-efficacy.***

The second source of modeling formation comes from the concept of visualizing others' attainments. Efficacy believes are raised when an individual visualizes another experience as being positive (Bandura, 1997). An individual uses perceptions of others ability to successfully perform a behavior to persuade themselves that they too have the ability (Bandura, 1982, Schunk, Hanson, & Cox, 1987, Staples, 1999). At the same time, when an individual observes the failure of another, judgments in their own ability are lowered. Again, it is important that the observed or visualized individual is seen as similar, as the greater the similarity the greater the effect. In this case, while perceived reference group success will have the greatest effect, it is also hypothesized that the success of social group members thought to be similar, will also influence efficacy judgments.

H10 ***The higher the perceived success of Internet use within an individual's reference group, the greater the level of Internet self-efficacy.***

H11 ***The higher the perceived success of Internet use by social group members, the greater the level of Internet self-efficacy.***

The third form of thought verification is verbal persuasion. Verbal persuasion is used to convince people that they possess the capabilities to achieve a sought behavior. Within SCT, persuasion often takes on the form of encouragement by others (Bandura, 1986). Conceptually, this suggests that people rely on the beliefs of others to form judgments of their abilities (i.e., self-efficacy). Verbal persuasion is thought to be more effective when the encouragement comes from someone in the individual's reference

group. Here, an individual's reference group consists of people from whom the individual seeks guidance.

Assessing computer use, Compeau and Higgins (1995) found that encouragement from others did significantly influence computer self-efficacy. Internet research investigating social support has yet to examine a person's reference group in the physical world. However, research does exist that suggests online relationships can develop and create a support mechanism (Katz & Aspden, 1997). In some cases these online relationships actually strengthen real world social ties (Wellman & Gulia, 1999). Activities identified include sending and receiving e-mail and participating in discussion groups and chatrooms. In order to extend current understanding of support, the relationship between Internet self-efficacy and real world social support as operationalized within SCT will be tested.

H12 ***The greater the encouragement to use the Internet by the reference group, the greater the level of Internet self-efficacy.***

Up to this point, modeling through vicarious learning has been defined within the behavior of others. However, throughout a given day, the amount of direct contact that an individual has with others in the physical and social environment is limited by their daily routines. This narrow avenue for experience increases the reliance on other vicarious mechanisms of thought verification. For example, vicarious learning occurs by observing and attending to how a medium such as television portrays and defines a phenomenon. As with other mechanisms of vicarious learning, this information is then compared with currently held judgments. This type of influence allows people to surpass the physical boundaries of their daily life by developing cognitive models through others

interpretations. Individuals can observe the "attitudes, styles of competency, and attainments of members of different segments of their society..." (Bandura, 1997, p. 93). Exposure to these types of models that demonstrate efficient strategies as well as attitudes toward a behavior, influences an individuals own belief in their abilities (Bandura, 1982; Schunk, 1987).

Given this and recent findings that indicate television as an influential component to perceptions of computing technology (Cross, 2000), it is expected that perceptions of media portrayal of the Internet as a positive phenomenon will increase Internet use.

H13: ***Positive media portrayals of Internet use will increase Internet self-efficacy judgments.***

Finally, SCT discusses the ability of efficacy beliefs to regulate affective states (Bandura, 1997). From one perspective, it is posited that people rely on psychological and emotional states to form efficacy judgments. Here, anxiety is an antecedent of self-efficacy. These states are considered most influential when people are faced with physical activities, health functioning, and coping with stressful or taxing situations (Bandura, 1997). However, another concept indicates that self-efficacy affects psychological states; here it is thought that people's self-efficacy beliefs affect the amount of stress (i.e., anxiety) they encounter or perceive. Simply stated, those who have high self-efficacy judgments do not envision that they will encounter stressful situations (Bandura, 1989; Compeau & Higgins, 1995; Compeau et al., 1999). The level of stress a person envisions subsequently influences whether or not they engage in a particular behavior. In the case of Internet use, an individual's level of Internet self-efficacy is thought to influence the amount of stress they perceive will be encountered while online.

These levels of perceived stress will determine the level of Internet use an individual will engage in. The goal of this study is to understand Internet use. Thus, while perceived stress has been considered an antecedent of self-efficacy, this study will evaluate stress (i.e., anxiety) as a mediating variable between self-efficacy judgments and level of Internet use.

That said, perceived stresses toward a behavior can cause arousal in the form of anxiety. Anxiety is defined "as a state of anticipatory apprehension over possible deleterious happening" (Bandura, 1997, p. 137). Initially, the majority of support for this relationship was found between low mathematical efficacy and high math anxiety (Bandura, 1997). Recent studies assessing cognitive models and new technologies have found that people with high levels of computer (Compeau & Higgins, 1995) and remote working (i.e., telecommuting) (Staples, et al., 1998) self-efficacy have low levels of computer anxiety.

Feelings of anxiety are also found to predict behavior. For example, Webster, Heian, and Michelman (1990), Compeau and Higgins (1995), Compeau et al., (1999) found a strong relationship between level of computer anxiety and computer use. While the relationship between computer anxiety and computer use has received a considerable amount of attention, separating out anxious feeling toward the Internet has not. Therefore, given the relationships between self-efficacy, anxiety, and Internet use the following are hypothesized.

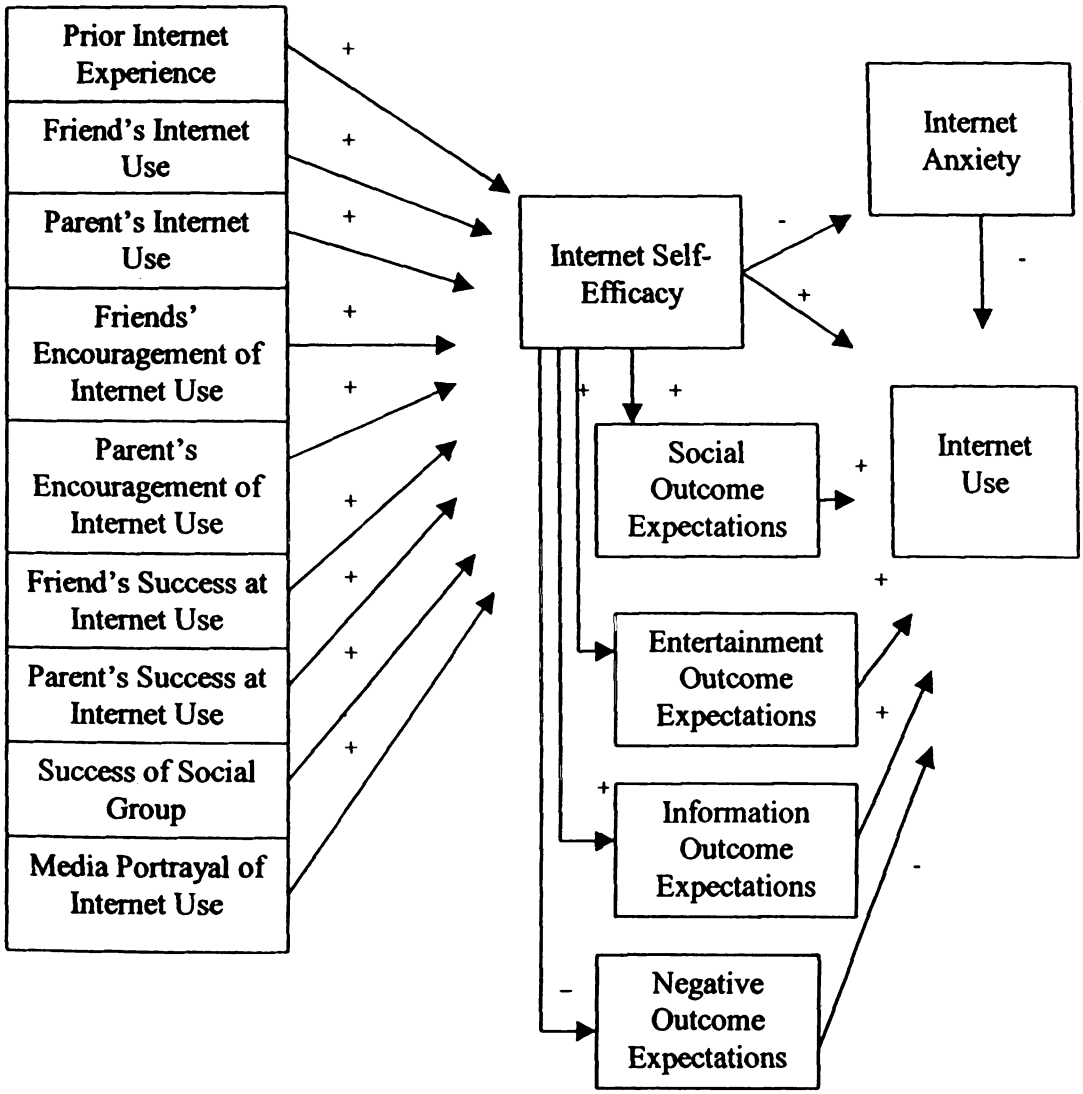
H14 ***The higher the Internet self-efficacy judgments, the lower the anxieties toward using the Internet.***

H15 ***The lower the anxieties toward using the Internet, the higher the Internet use.***

Beyond the investigation of bivariate relationships, this research also considers how these constructs influence each other both directly and indirectly. To accomplish this, a social cognitive model demonstrating the development of Internet use was constructed. The research model guiding this study was developed from the conceptual framework of social cognitive theory as well as previous research on Internet use (Bandura, 1986; Bandura, 1997; Compeau et al., 1999; Eastin & LaRose, 2000) (see Figure 1, 2, 3, and 4). The model assesses Internet use and self-efficacy by identifying influential factors (i.e., antecedents) such as prior experience, reference group Internet use, ability and support, social group perceptions, media portrayals social outcome expectations and anxiety. By assessing the direct and indirect relationships among previous Internet experience, reference group Internet use, ability and verbal support, social group success, media portrayals, Internet anxiety, Internet self-efficacy judgments, outcome expectancies and Internet use a better understanding of cognitive mapping will be developed (see Figure 5).

Specifically, Internet experience, parent's and friend's Internet use, success, and encouragement, social group success, and media portrayals are the eight exogenous predictors of Internet self-efficacy. These efficacy judgments are then used to predict social, entertainment, informational, and negative outcome expectations, Internet anxiety, and Internet use. Social, entertainment, informational, and negative outcome expectations and Internet anxiety also are used to predict Internet use.

Figure 5. Research Model



CHAPTER 2

Methods

In order to examine the hypothesized relationships among environmental influences, cognitive models and Internet use, the present study was conducted. Pearson Correlations were used to test each of the hypothesized relationships, while path analysis was used to test the proposed theoretical model. Corrections for attenuation were made when testing the path model.

Participants

A total of 260 high school students from Midwest and Southwest high schools participated in the study. Sixty-three of the Midwest students took part in the pretest while the remaining 197 students from the Southwest school were used in actual analyses. Of those used in the final analyses, 106 (54%) were females and 91 (46%) were male, with a mean age of 17 years old. Respondents' race was distributed as follows: 57 (29%) were Hispanic/ Latino, 101 (51%) Caucasian, 25 (13%) African American, 5 (3%) Asian, 4 (2%) Native Americans, and 4 (2%) were identified as 'other.'

Pretest

Prior to the actual data collection, a pretest was conducted with students from a Midwest school (N = 63). Specifically, an empirical investigation was performed on each of the constructs under consideration. Other logistical survey considerations such as survey length and question wording were also assessed. All constructs were tested using confirmatory factor analysis (CFA) (Hunter & Gerbing, 1982). CFA tests a specified factor structure based on theory-driven indicators. The pretest instrument can be found in

Appendix A. The confirmatory factor process also was conducted on actual study participants; including tests of internal consistency and parallelism where needed.

Changes made from the pretest include (1) all reversed items were changed to more clearly identify negatively phrased questions. For example, items changed from 'unsuccessful' or 'unfavorable' to 'NOT successful' and 'NOT favorable.' (2) At the beginning of each section, participants read a passage that clearly stated that some of the items were negatively phrased. (3) All usage items were changed from a seven-point scale to open-ended (Schwarz, 1999). (4) Items were changed to more clearly describe the intended meaning where deemed necessary. And, (5) items breaking weekend Internet use into Saturday and Sunday were collapsed into one question asking about total weekend Internet use.

Procedure

All questionnaires were administered at the beginning of each class period. A total of 12 junior and senior classes were surveyed. Classes contained between 20 and 30 students. Data collection was conducted over a two-day period. Participants spent between 20 and 30 minutes completing the questionnaire. Upon completion, the participants were debriefed on the nature of the study.

The final questionnaire can be found in Appendix B. With the exception of parent's success (N = 152), the number of subjects used in each construct ranges from 191 to 197.

Exogenous Variables

Prior Internet experience. Internet experience was measured by determining the number of years each participant had used the Internet. Past research has measured prior Internet experience as the amount of time an individual has been using the Internet (Eastin & LaRose, 2000). However, this overall measure does not provide all the necessary information to adequately understand what people have been doing online in the past. In addition, categorizing activities can serve as a cueing mechanism increasing response accuracy.

Therefore, this study assessed how long each participant has been accessing the Internet as well as the activities in which they engage (e.g., playing games, searching for information, listening to music, etc.). Specifically, what and how long a person has been participating in each activity was measured. Five open-ended items were used to assess the number of years a person has used the Internet to (1) gather information, (2) play games, (3) listen to music, (4) meet people, and (5) email. These items were aggregated to produce a prior Internet experience (M = 10.33, SD = 6.13).

How many years have you used the Internet for gathering information? _____year(s)

How many years have you been playing video games on the Internet? _____year(s)

How many years have you been listening to music on the Internet? _____year(s)

How many years have you been meeting people (e.g., chat rooms and discussion groups) on the Internet? _____year(s)

How many years have you been emailing people? _____year(s)

Teenage Reference Groups: An individual's reference group consists of people from whom the individual seeks guidance. Research suggests that a teenagers reference group consist of a small group of friends (i.e., peers) and parents (Cross, 2000). Therefore, when measuring the amount of Internet use and encouragement from an individual's reference group, items focused on a close friend and a parent. A main concept driving this study is cognitive modeling through perception, thus, when measuring Internet use, ability and encouragement by an individual's reference group, this study assessed individual perception. Here, it is irrelevant if a parent uses the Internet 20 hours per week if their child perceives them as spending 10 hours online weekly.

That said, reference group support was defined by six constructs, (1) a friend's use; (2) a friend's ability; (3) friends' encouragement; (4) a parent's use; (5) a parent's ability; and (6) parents' encouragement.

Friend use. A friend's use was measured with three open-ended items assessing average weekday Internet use at home and school, and home use on the weekend (M = 8. 75 hours, SD = 6.56 hours). Items included:

Think of a close friend, on an average weekday (Monday through Friday), how many hours does that friend spend on the Internet at home? _____Hour(s)

Considering that same friend, on an average weekday, how many hours does that friend spend on the Internet at school? _____Hour(s)

Considering that same friend, on an average weekend, how many hours does that friend spend on the Internet? _____Hour(s)

Friend Success. A friend's success was measured with three seven point Likert-type items ($\alpha = .83$) assessing the perceived success of a close friend when using the Internet for general activities (M = 16.09, SD = 4.49). Items included:

Considering that same friend, how **successful** is that friend at using the Internet to complete school assignments?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

Considering that same friend, how **successful** is that friend at using the Internet for entertainment purposes (for example, Internet use that is not schoolwork related)?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

Considering that same friend, how **easy** is it for that friend to use the Internet for schoolwork?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

Friend Encouragement. Friends' encouragement was measured with three seven-point Likert-type items ($\alpha = .85$) ranging from Strongly Disagree (score = 1) to Strongly Agree (score = 7). This construct measured the amount of encouragement received from friends (M = 13.37, SD = 5.37). Items used were as follows:

My friends encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

My friends discuss how being able to use the Internet will help me in the future.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

My friends tell me that there are a lot of fun things to do on the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

Parent use. A parent's use was measured with three open-ended items assessing average weekday Internet use at home and work, and home use on the weekend (M = 6.42, SD = 6.84). Reports of parents never using the Internet were coded as zero and left in analyses. Items included:

Think of your parent who uses the Internet the most, on an average weekday, how many hours does that parent spend on the Internet at home?

_____Hour(s)

Considering that same parent, on an average weekday, how many hours does that parent spend on the Internet at work?

_____Hour(s)

Considering that same parent, on an average weekend, how many hours does that parent spend on the Internet?

_____Hour(s)

Parent Success. A parent's ability was measured with four seven point Likert-type items (α = .91) assessing the perceived successfulness of a parent when using the Internet for general activities (M = 19.96, SD = 6.82). These items where not completed by respondents who reported their parents had never use the Internet. Items used included:

Considering that same parent, how **successful** is that parent at using the Internet for work related (for example, information gathering) projects?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

Considering that same parent, how **successful** is that parent at using the Internet for entertainment (for example, Internet use that is not work related)?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

Considering that same parent, how **easy** is it for that parent to use the Internet for work related projects?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

Considering that same parent, how **easy** is it for that parent to use the Internet for entertainment (for example, Internet use that is not work related)?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

Parent Encouragement. A parent's encouragement was measured with three seven point Likert-type items ($\alpha = .85$) ranging from Strongly Disagree (score = 1) to Strongly Agree (score = 7). This construct measured the amount of encouragement received from a parent ($M = 12.29$, $SD = 5.39$). Items used are as follows:

My mom or dad tells me that the Internet is a great source of information.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

My mom or dad discusses how being able to use the Internet will help me in the future.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

My mom or dad tells me that there are a lot of fun things to do on the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

As stated, while reference group support is thought to play a key role in cognitive development, there are other more general social influences that also need to be considered (Compeau & Higgins, 1995, Bandura, 1986). These other support mechanisms are identified as perceived success of social group at using the Internet and media portrayals of the Internet.

Social Group Success. Perceptions of social group success was measured with four Likert-type items ($\alpha = .91$) assessing the success of kids 'the same age' have when using the Internet ($\underline{M} = 22.60$, $\underline{SD} = 5.09$). Items included:

In general, how **successful** are kids your age at using the Internet to help them with their schoolwork?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

In general, how **successful** are kids your age at using the Internet for entertainment purposes?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

In general, how **easy** is it for kids your age to use the Internet for schoolwork related projects?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

In general, how **easy** is it for kids your age to use the Internet for entertainment purposes (for example, Internet use that is not work related)?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

Media Portrayal. Media portrayal was measured with four Likert-type items ranging from Not at All (score 1) to A Lot (score 7) ($\alpha = .83$), which assessed how the media portray Internet use ($M = 17.61$, $SD = 5.65$). The following items were included:

In general, how often do you see people on television programs and commercials (not including news programs) use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

In general, how often do you see kids your age on television and commercials (not including news programs) use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

In general, how often do news programs talk about the Internet in a favorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

In general, how often do you see people in movies use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

Endogenous Variables

A total of four outcome expectancies were measured. These included social, personal, which contained both information and entertainment expectancies, and negative outcome expectancies. Items created for each of the outcome expectancies were borrowed from the research of Charney and Greenberg (in press) and Eastin and LaRose (2000).

Social Outcome Expectancies. Social expectancies were constructed using four seven point Likert items ranging from Strongly Disagree (score 1) to Strongly Agree (score 7) ($\alpha = .73$). This construct measured the perceived likelihood of developing relationships over the Internet ($M = 16.74$, $SD = 6.22$). Items used included:

I am likely to establish a romantic relationship on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am likely to get in touch with people I know on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am NOT likely to meet new friends on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am NOT likely to visit chat areas to talk with other people.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Both information and entertainment outcome expectancies were constructed using five Likert items ranging from Strongly Disagree (score 1) to Strongly Agree (score 7).

Information Outcome Expectancies. The information outcome expectancy construct included three items which assessed the likelihood of obtaining information on the Internet ($\underline{M}$ = 16.28, $\underline{SD}$ = 4.59) (α = .72). Items included:

I am likely to get immediate information about big news events on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am likely to find information to complete a class assignment on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am likely to get information about products such as cars or clothes on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Entertainment Outcome Expectancies. The entertainment outcome expectancy construct was measured with two items assessed the likelihood of being entertained while on the Internet ($\underline{M}$ = 10.74, $\underline{SD}$ = 3.42) (α = .79). Items included:

I am likely to find a way to pass time on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am likely to be entertained on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Negative Outcome Expectancies. Three items ranging from Strongly Disagree (score 1) to Strongly Agree (score 7) measured negative outcome expectancies ($\alpha = .73$). This construct assessed the likelihood of encountering negative outcomes associated with Internet use (M = 11.28, SD = 4.67). Items included:

I am likely to find that search engines do NOT have enough detailed to quickly find what I am looking for.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am likely to have problems opening large documents found online.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am likely to have long download times on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Internet Self-Efficacy. Using items created by Eastin & LaRose (2000), Internet self-efficacy was measured with seven Likert items ranging from Strongly Disagree (score 1) to Strongly Agree (score 7) ($\alpha = .90$). The efficacy construct is thought to measure a person's belief in their ability to organize and execute the courses of action required to produce given behavior (M = 30.20, SD = 11.15). Items included:

I am confident understanding terms/words relating to Internet hardware.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am confident understanding terms/words relating to Internet software.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am confident describing functions of Internet hardware.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am confident trouble shooting Internet problems.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am confident explaining why a task will not run on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am confident using the Internet to gather data.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I am confident learning advanced skills in a specific Internet program.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Internet Anxiety. Adopting items from the Compeau et al., (1999) computer anxiety scale, an Internet anxiety construct was created using four Likert items ranging from Strongly Disagree (score 1) to Strongly Agree (score 7) ($\alpha = .90$). This construct assessed the level of anxiety a person feels toward the Internet (M = 11.07, SD = 6.86). Items were:

The Internet is somewhat intimidating to me.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I hesitate to use the Internet for fear of making a mistake I cannot correct.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

I'm afraid that I might destroy/ lose information on my computer by accessing corrupted files while on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Using the Internet makes me nervous because I'm not sure how much personal information (for example, age, gender, sites I visit, etc.) is being collected electronically.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Internet Use. Internet use was measured with ten open-ended items. Five items assessed amount of Internet use on an average weekday, while the other five items assessed use on an average weekend. Each unit of measure assessed use in the following areas: (1) gather information, (2) play games, (3) listen to music, (4) meet people, and (5) email. All ten items were then aggregated to produce Internet use ($M = 9.19$, $SD = 7.05$).

On an average **weekday** (***Monday through Friday***), how many hours do you use the Internet to gather information? _____hour(s)

On an average **weekday**, how many hours do you use the Internet to play video games? _____hour(s)

On an average **weekday**, how many hours do you use the Internet to listen to music? _____hour(s)

On an average **weekday**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)? _____hour(s)

On an average **weekday**, how many hours do you use the Internet to email? _____hour(s)

On an average **weekend**, how many hours do you use the Internet to gather information? _____hour(s)

On an average **weekend**, how many hours do you use the Internet to play video games? _____hour(s)

On an average **weekend**, how many hours do you use the Internet to listen to music? _____hour(s)

On an average **weekend**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)? _____hour(s)

On an average **weekend**, how many hours do you use the Internet to email?

_____hour(s)

CHAPTER 3

Results

Overall, ninety-three percent of the participants reported having a computer at home, and 86 percent reported having home Internet access. Seventy percent reported their Internet use occurred either 'mostly in the house (52%) or 'only in the house (18%). Other Internet use occurred 'only outside the house' (16%), 'about equally in the house and outside the house' (9%), and 'mostly outside the house' (4%).

Only five percent of the participants reported no prior experience with information seeking via the Internet. Thirteen percent reported never using email, followed by chat room use (27%), listening to music (32%) and online video game playing (49%). Prior Internet experience was led by information seeking with an average of 2.98 years; followed by prior email use, chat room use, listening to music, and finally playing games (see Table 1).

Table 1

Prior Experience of Internet Use (N = 197)

Type of Use	Mean (years)	SD
Information Seeking	2.98	1.54
Email	2.50	1.65
Chat room	1.95	1.71
Music	1.25	1.23
Game Playing	1.24	1.66

Information seeking was the most common type of current use with 97 percent of the participants reporting spending at least some looking for information on the Internet.

Email use (80%) is the second most common type of use, followed by music (61%), chat room (58%), and video game playing (47%). Amount of Internet use was led by information seeking, followed by email, music, chat room, and online video games (see Table 2).

Table 2

Amount and Type of Internet Use (N = 197)

Type of Use	Mean (hours)	SD
Information Seeking	2.50	2.26
Email	1.84	1.70
Music	1.82	2.44
Chat room	1.60	2.21
Game Playing	1.35	2.12
Total Use	9.10	6.78

The initial concept was that reference groups would vicariously influence efficacy judgments. To better understand how the different components within an individual's reference group are related, an analysis of each bivariate relationship was assessed. The data indicated that the largest correlation coefficients are between, (1) friends' and parent's encouragement (r = .63), (2) friend's success and social group success (r = .67), and (3) friend's success and friends' encouragement (r = .61) (see Table 3). These strong relationships are not surprising as it is expected that a friend who is successful at using the Internet also is going to be more encouraging. Likewise, when assessing social group success, it is expected that an individual will include his/her friends as part of their social group, thus, increasing the relationship between the two constructs. The only non-

significant relationship exists between friend's use and parent's encouragement (r = .08). The remaining correlation coefficients are low to moderate in size. All other relationships among the antecedents of Internet self-efficacy can be found in Table 3.

Table 3

Pearson Correlation Coefficients among the Antecedents of Internet Self-efficacy

	FU	FS	FE	PU	PS	PE	SGS	MP	IE
Friend Use (FU)									
Friend Success(FS)	.35**								
Friend Encourage (FE)	.28**	.61**							
Parent Use (PU)	.30**	.25**	.14						
Parent Success (PS)	.19*	.51**	.43**	.50**					
Parent Encourage (PE)	.08	.35**	.63**	.26**	.53**				
Social Group Success (SGS)	.35**	.67**	.54**	.18**	.47**	.35**			
Media Portrayal (MP)	.28**	.47**	.55**	.24**	.47**	.49**	.50**		
Internet Experience (IE)	.26**	.35**	.31**	.32**	.31**	.21**	.37**	.29**	

* $p < .05$
** $p < .01$

Four outcome expectations were assessed, social, entertainment, informational, and negative. Each was designed to measure different expectations of using the Internet. Data indicated that all variables are significantly correlated. A substantially large

correlation coefficient was found between information and entertainment outcome expectations (r = .70) (see Table 4). This suggests that those who have high information expectations also have high entertainment expectations. This also could indicate that information uses of the Internet are considered entertaining, as defined in this study. That said, these constructs empirically demonstrate multidimensionality and have been conceptually distinct constructs in pervious research (Charney & Greenberg, in press; LaRose, Mastro, & Eastin, in press) thus, they remain as two different constructs in further analyses.

Table 4

Pearson Correlation Coefficients among Outcome Expectations

	SE	IE	EE	NE
Social Expectations (SE)				
Information Expectations (IE)	.50**			
Entertainment Expectations (EE)	.54**	.70**		
Negative Expectations (NE)	-.30**	-.32**	-.34**	

* $p < .05$
** $p < .01$

Zero order correlations were used to initially test each of the hypothesized relationships. Path analysis was used to test the combined effect of their direct and indirect theoretical relationships.

Hypotheses

Hypothesis 1 posited that the greater the social outcomes expectancies from Internet use, the greater the actual Internet use; this relationship was supported by the data ($r = .42$, $p < .001$).

Also supported were the relationships between entertainment expectations and Internet use ($r = .33$, $p < .001$) and information expectations and Internet use ($r = .34$, $p < .001$) (see Hypothesis 2).

Hypothesis 3, which indicated that an increase in negative outcome expectancies would decrease Internet use was supported ($r = -.25$, $p < .001$). Combined, these findings support the connection between cognitive models of outcome expectations and total Internet use.

Another cognitive model, which hypothesized a positive relationship to Internet use, was Internet self-efficacy (Hypothesis 4). Here, Internet self-efficacy was found to be positively related to Internet use ($r = .43$, $p < .001$).

Hypotheses 5, 6, and 7 posited that Internet self-efficacy would be positively related to social, entertainment, and information outcome expectations, and negatively related to negative outcome expectations. Data indicated that these relationships were all significantly related to Internet self-efficacy. Internet self-efficacy was positively related to social outcome expectancies ($r = .48$, $p < .001$), entertainment outcome expectancies ($r = .58$, $p < .001$), and information outcome expectancies ($r = .56$, $p < .001$), and negatively related to negative outcome expectations ($r = -.48$, $p < .001$).

Supporting Hypothesis 8, prior Internet experience also indicated a significant positive relationship with Internet self-efficacy judgments ($r = .40$, $p < .001$).

Turning to the environmental influences of Internet self-efficacy, results indicate a significant relationship between friend ($r = .31$, $p < .001$) and parent ($r = .21$, $p < .001$) (i.e., reference group) Internet use and self-efficacy judgments, supporting Hypothesis 9.

The success of an individual's reference and social group at using the Internet was posited to have a positive relationship with Internet self-efficacy. Here, friend ($r = .46$, $p < .001$), parent ($r = .43$), and social group ($r = .49$, $p < .001$) success at using the Internet were significantly related to efficacy judgments; thus indicating support for Hypotheses 10 and 11.

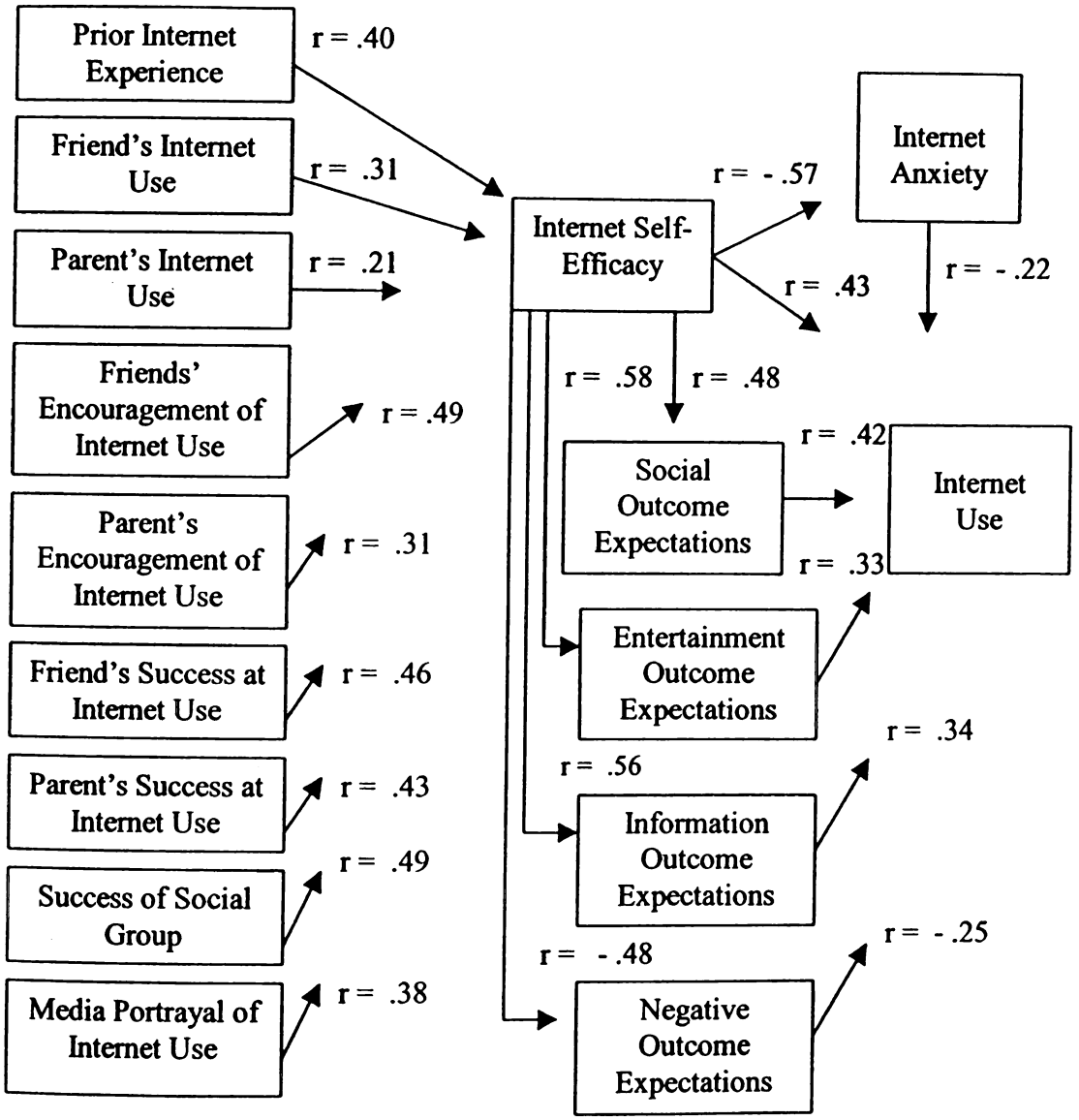
Data also support the relationship between efficacy judgments and encouragement from friends' ($r = .49$, $p < .001$) and a parent ($r = .31$, $p < .001$) (see Hypothesis 12).

Hypothesis 13, which assessed the relationship between vicarious learning through television portrayals was found to increase efficacy judgments ($r = .38$, $P< .001$).

Finally, as Hypotheses 14 and 15 state, significant relationships between Internet anxiety and efficacy judgments ($r = - .57$, $p < .001$) and Internet anxiety and Internet use ($r = - .22$, $p < .001$) were found to be significant.

These *correlation coefficients* can be viewed within the context of the theoretically proposed model (see Figure 6).

Figure 6. Pearson Correlation Coefficients as Conceptualized within the Research Model

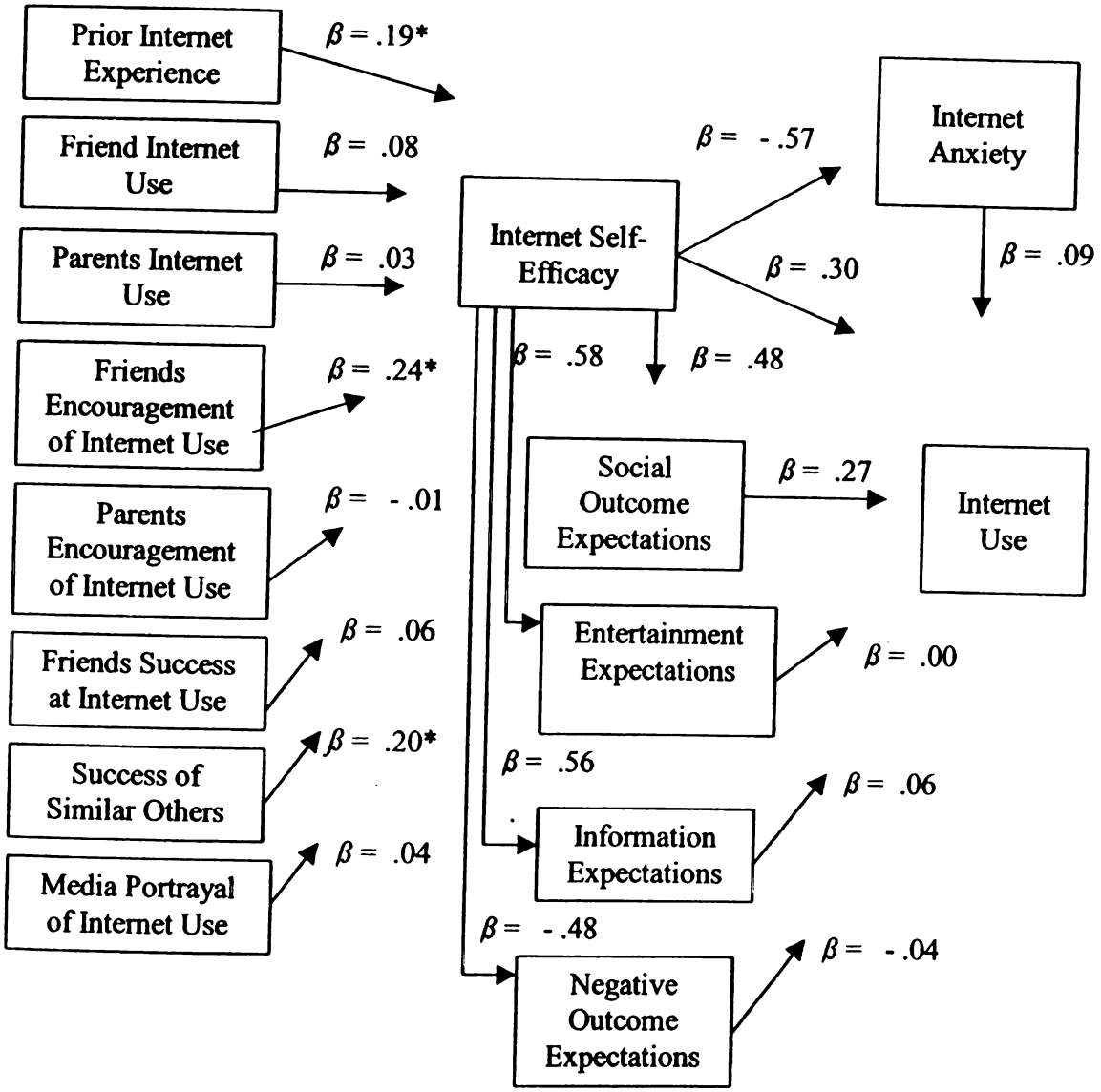


Path Model Analysis

Using path modeling analysis, the second analysis tests both the direct and indirect relationships among each of these variables as posited by Social Cognitive Theory. Parent's ability was dropped from the model because 23 percent of the respondents indicated that their parents had never used the Internet; thus, ability for those parents could not be assessed. Results suggest that the data did not fit the model, $\chi^2(46) = 105.89$, $p < .001$ (see Figure 7). Only three of the antecedents of self-efficacy demonstrated substantial coefficients; prior Internet experience ($\beta = .19$), friends' encouragement of Internet use ($\beta = .24$), and social group success ($\beta = .20$). All other antecedents of Internet self-efficacy, friend's use ($\beta = .08$), parent's use ($\beta = .03$), parents encouragement ($\beta = -.01$), friend's success ($\beta = .06$), and media portrayal ($\beta = .04$) indicated only negligible contributions. Internet self-efficacy however displayed strong relationships with social outcomes expectancies ($\beta = .48$), entertainment outcomes expectancies ($\beta = .58$), information outcomes expectancies ($\beta = .56$), negative outcomes expectancies ($\beta = -.48$), Internet anxiety ($\beta = -.57$), and Internet use ($\beta = .30$).

Other predictors of Internet use indicated mixed results. While social outcome expectations indicated a substantial relationship ($\beta = .27$), entertainment ($\beta = .00$), information ($\beta = .06$) and negative ($\beta = -.04$) outcome expectations did not. Finally, Internet anxiety indicated a small positive relationship ($\beta = .09$) with Internet use. Note that this relationship was hypothesized to be negative.

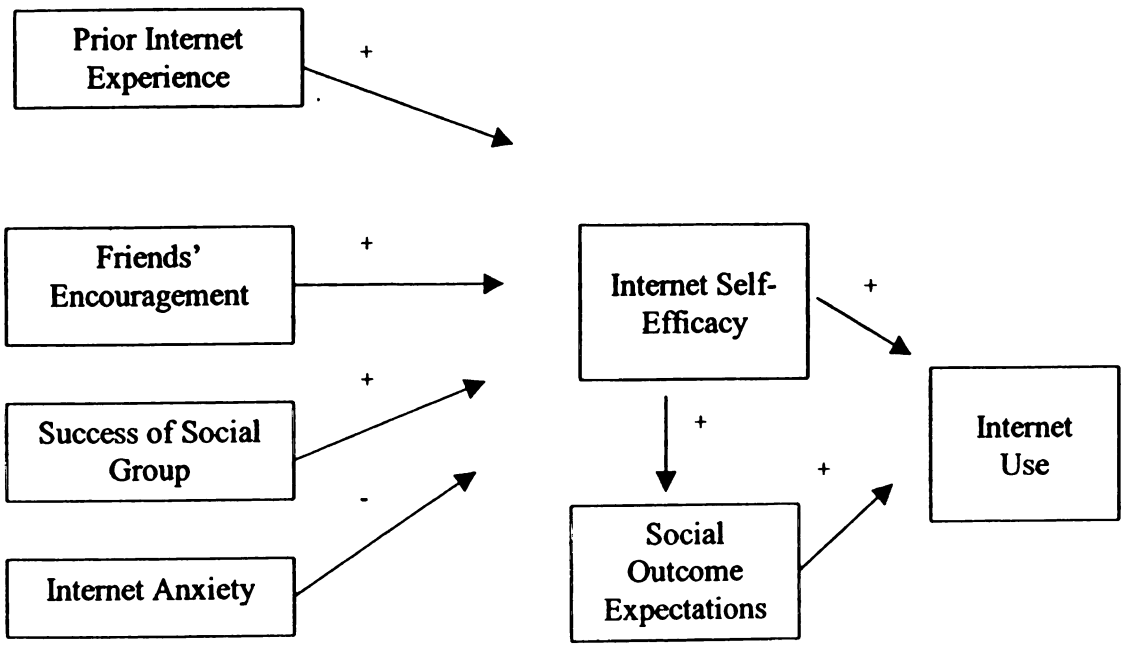
Figure 7: A Social Cognitive Model of Internet Use



There are several reasons why this model failed. First, variables such as friend's and parent's Internet use, parent's encouragement, friend's success, media portrayals, and entertainment, information, and negative outcome expectancies did not produce meaningful relationships. These weak relationships are due to high levels of multi-collinearity among the predictors of Internet self-efficacy and Internet use (see Tables 3 and 4). Second, Internet anxiety does not mediate the relationship between Internet self-efficacy and Internet usage. This is partially because Internet anxiety has a stronger relationship with Internet self-efficacy than it does with amount of Internet use. Therefore, anxiety is not a mediator of Internet use as suggested by some research investigating computer use (Compeau et al., 1999; Compeau and Higgins, 1995), but rather, it is an antecedent to Internet self-efficacy as early research on self-efficacy would suggest (Bandura, 1997). Understanding these errors in the model, a post hoc model adjusting for each problem was tested (see Figure 8).

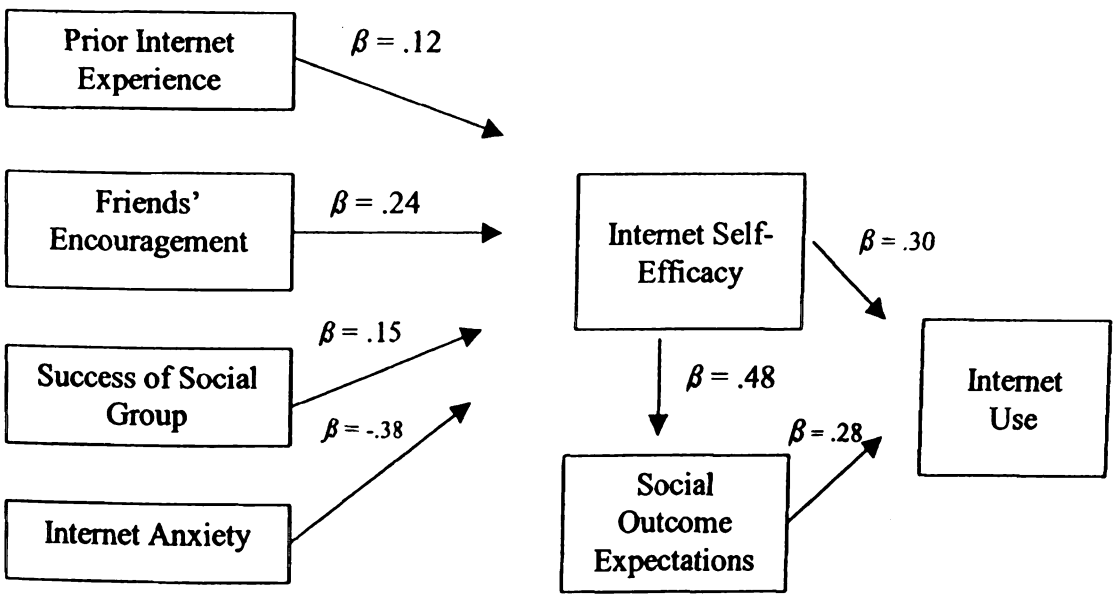
The new model, as seen in Figure 8, has prior Internet experience, friends' encouragement, social group success, and Internet anxiety as direct antecedents to Internet self-efficacy. Internet self-efficacy then has both a direct and indirect relationship with Internet use through social outcome expectancy. Finally, social outcome expectancy is modeled as having an influence on Internet use.

Figure 8: A Revised Conceptual Model Examining the Social Cognitive Model of Internet Use



Results suggest that the data are consistent with the model, $\chi^2(8) = 13.81$, $p > .05$ (see Figure 9). With the exception of prior Internet experience, the antecedents of Internet self-efficacy produced substantial coefficients. Friends' encouragement (β = .24), social group success (β = .16), and Internet anxiety (β = - .38) all individually contributed substantially to Internet self-efficacy. Internet self-efficacy demonstrated strong relationships to both social outcome expectancy (β = .48) and Internet use (β = .30). Social outcome expectancy also obtained a substantial relationship with Internet use (β = .28).

Figure 9: A Revised Model Testing the Social Cognitive Model of Internet Use



In Figure 9 prior Internet experience does not obtain a substantial coefficient (β = .12). However, because of strong empirical evidence supporting this relationship, leaving it in the model is beneficial for future research. While this model does stay within the theoretical framework presented, it is data driven and thus should be retested in order to validate these findings. In addition, large error terms also were found between friends' encouragement and social outcome expectations (.19), and social group success and social outcome expectations (.19); indicating that the observed correlation coefficients were larger than the reproduced. This could suggest that while self-efficacy is a mediator of Internet use, it might not be the sole mediator in this type of model.

CHAPTER 4

Discussion

It should be noted that the simple bivariate relationships hypothesized are counterintuitive to the path model tested. For example, the model contains no simple bivariate relationships and thus, hypothesizing relationships while not controlling for all other predictors is counterintuitive. Nonetheless, when evaluating the hypothesized relationships, support was found for all 15 bivariate relationships tested. Internet use was significantly related to social, informational, entertainment, and negative outcome expectations, Internet self-efficacy and Internet anxiety. Internet self-efficacy was significantly related to prior Internet experience, friend's and parent's Internet use, friend's and parent's Internet success, friends' and parent's encouragement, social group success, media portrayals, social, personal and negative outcome expectancies, and Internet anxiety. That said, it is concluded that SCT does provide a good framework from which to understand the environmental, cognitive and behavioral mechanisms of Internet use when assessing adolescents.

However, the model evaluating the direct and indirect relationships among each of the variables (see Figure 5) was not supported. In testing the model, it was evident which variables played a substantial role in both efficacy judgments and Internet use. As shown in the post hoc model, prior experience, friends' encouragement, social group success, and Internet anxiety all uniquely contribute to Internet self-efficacy judgments. Internet self-efficacy was then related to social outcome expectancies and Internet usage. Finally, social outcome expectancies indicated a substantial relationship with Internet

use. Thus, while the original model failed, the new model indicates that key components within SCT do play a major role in adoption by adolescents.

Why did the original model fail? To begin, the variables friend's and parent's Internet use, parent's encouragement, friend's success, media portrayals, and entertainment, information, and negative outcome expectancies did not produce meaningful relationships. These weak relationships are partially due to moderate to high levels of multi-collinearity among the predictors of Internet self-efficacy and Internet use (see Tables 3 and 4). Also, it could be argued that while the constructs measured in the present study separated information and entertainment, the two might not be distinct at any given time for the user. For example, an individual could be at a music site looking up information about his/her favorite group; the user could perceive this behavior as either entertaining or informative. Here, it would be advantageous to question users regarding their motivation (e.g., information or entertainment purposes) while in the act of searching, and then apply the appropriate expectancy scale. Finally, Internet anxiety did not mediate the relationship between Internet self-efficacy and Internet usage as posited. In part, this is because Internet anxiety had a stronger relationship with Internet self-efficacy than amount of Internet use.

From an item analysis, it could be argued that asking participants to think of "a friend" or "a parent" was too limiting. The diverse applications available on the Internet allow users to customize their experience (Cody, 1999; Gervey, 2000). For example, a friend may only use the Internet for gaming, leaving the remaining items that question school uses irrelevant. This same friend may be high on entertainment success and low on school success; providing misleading results for the relationship between Internet self-

efficacy and friend's success. This can also be argued for parents. A parent may use the Internet all day at work, making them the "high" Internet user, however, this same parent may never use the Internet at home, making it impossible to accurately perceive their success. Perhaps this is why social group success worked so well; participants were able to evaluate more generally and thus, incorporate different types of users. Given this, the inclusion of more than one friend and both parents should provide a more accurate and complete picture.

Further, while parent's encouragement did not obtain a substantial relationship, friends' encouragement did. Friends' encouragement allowed respondents to consider more than one friend, while parental encouragement was limited to a single parent. By allowing more than one friend to be considered, respondents were able to consider a broader range of encouragement. That said, giving respondents the opportunity to consider both parents could increase the relationship. The media portrayal questions were also broad in scope, allowing for many different media sources to be considered. However, with media portrayals a more specific or relevant example of television could have been given. Instead of listing news portrayals on the Internet, MTV portrayals would prompt a more relevant frame of reference for teens (Cross, 2000). Of course all of these rationales are only speculative and should be empirically tested in future research.

Internet self-efficacy was found to influence Internet use and social outcome expectations. These findings reinforce previous research identifying efficacy judgments as a major component in the adoption and utilization of information systems such as the Internet. Current research indicates that a primary use of the Internet is social (e.g., email)

(Nie & Embring, 2000; Lubans, 1999; NTIA, 2000), thus, it is not surprising that social outcome expectations are a driving and dominant antecedent to overall Internet use. However, because this sample only consisted of adolescents, the model may differ when considering an adult sample. For example, obtaining information through social and general use is a primary expectation among adult users (Cody, 1999); therefore, information outcome expectancies may drive a model using an adult sample.

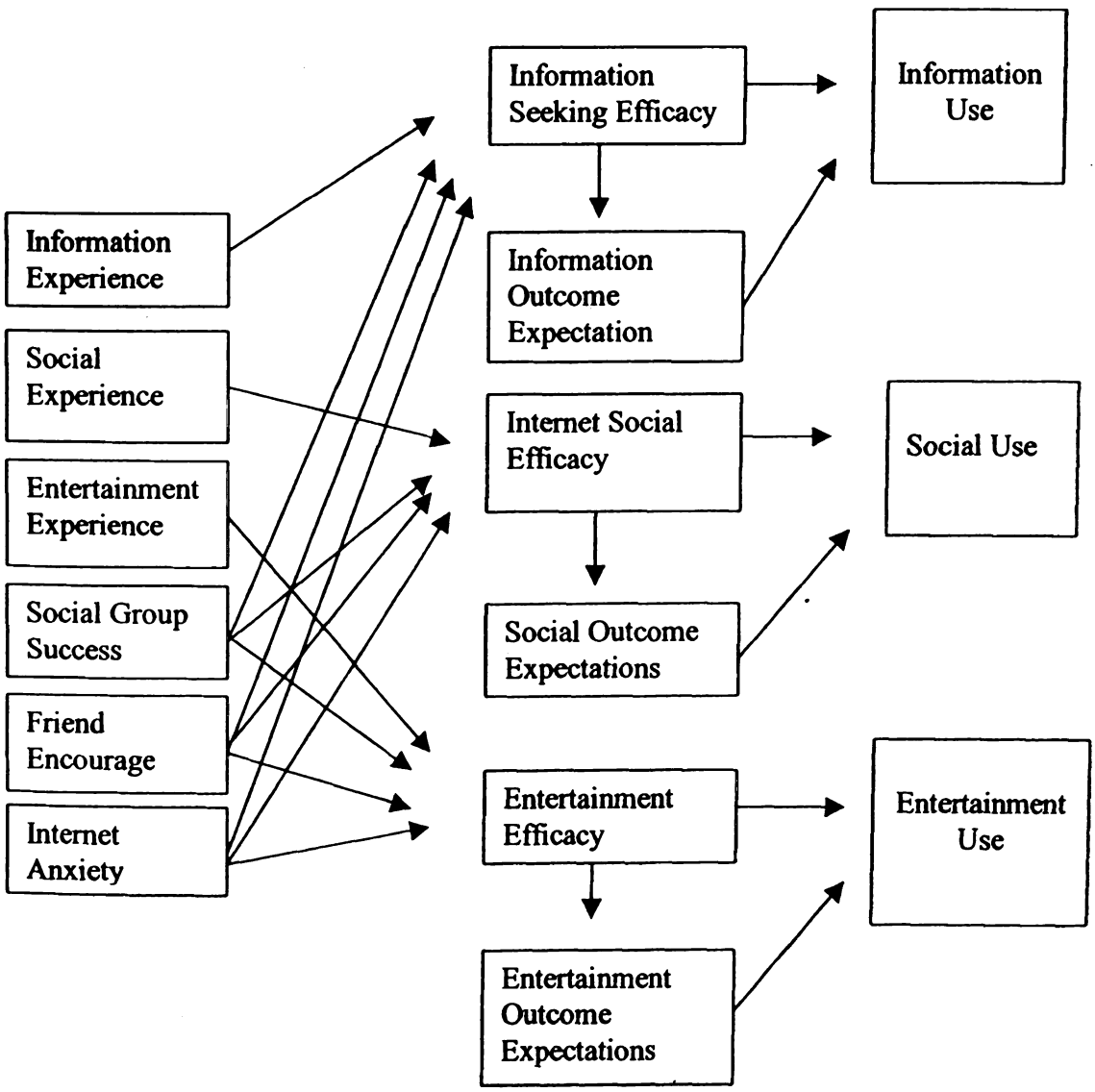
Future research

The first step for future research should be to validate the post hoc model supported in this study. Since research in this area will most likely continue to evaluate online users as a mass audience, it is important to have a valid model for research only interested in assessing amount of general use. Constructs such as Internet self-efficacy provide online research with a perceived ability control for novice users when experimentally testing constructs such as navigation ability; thus, the validation of a self-efficacy construct is important.

However, according to social cognitive theory, self-efficacy is most effective when evaluated within a given domain or behavior. This study looked at self-efficacy within the domain of Internet use. A more specific breakdown of Internet self-efficacy as well as Internet use would provide a greater understanding of adoption (Bandura, 1997). Specifically, by creating distinct models of Internet use, new cognitive models can be developed, thus creating opportunities for variables such as entertainment and information outcome expectations to play a more substantial role in predicting Internet use.

This type of model would (a) evaluate different types of prior Internet experience, (b) assess task specific self-efficacy judgments such as social, informational, and entertainment, (c) assess specific types of outcome expectancies such as social, entertainment, and informational; and finally, (d) identify specific types of actual use (Figure 10).

Figure 10. Distinct Models of Internet Use



A simple evaluation of the relationships within the current data set demonstrates the plausibility of the model. Here, strong relationships are observed between social use (i.e., email and chatroom use) and social outcome expectations ($r = .48$, $p < .001$), informational use and informational outcome expectations ($r = .37$, $p < .001$), and entertainment use (i.e., online game playing and music) and entertainment outcome expectations ($r = .28$, $p < .001$). With the exception of entertainment, all of these outcome expectations have a stronger relationship with their corresponding use measure than with general Internet use.

The Internet has long been considered a non-restricted medium, which allows users to customize their online experiences. To advance research in this area, it will be essential to begin micro-analyzing the user and their unique experiences. Figure 10 represents a step toward this type of understanding. Research designed to test this model should experimentally track users under different conditions. For example, by implementing interventions designed to increase efficacy judgments, researchers will be able to increase certain types of use that are seen as more beneficial (e.g., informational use) to the user. Through this process, more robust and effective measures can be developed for each of the models.

Increasing the amount that people use the Internet is only the first step to a more effective digital society. With a growing number of antisocial activities available on the web, it is important to understand how use differs. A practical starting point for this type of analysis is to assess difference in types of use across gender and race. The present data set indicated no difference between gender and actual use ($r = .02$, $p > .05$). However,

women were found to be significantly higher social users ($r = .16$, $p < .05$) and significantly lower in their online game playing ($r = -.29$, $p < .05$). Finally, there was virtually no difference between gender and information ($r = .04$, $p > .05$) or music Internet use ($r = -.06$, $p > .05$).

According to current understanding of Internet use and subsequent social isolation (Nie & Embring, 2000), these results indicate that males are more likely to suffer possible negative psychological effects such as those resulting from social isolation than females due to their increased levels of online gaming. These findings also suggest that females are more likely to be experiencing the social benefits of the Internet because of their increased levels of social use. While these types of differences also should be assessed by race, sample limitations in this study prevented these differences from being explored. This would allow digital divide researchers to begin questioning how certain minority groups are using the Internet and with what effects.

Future research should also look to past models of computer use to further understanding of the Internet. For example, rather than limiting outcome expectations to the immediate future, future research should consider the long-term outlooks of use. A study conducted by Thompson et al. (1989) found a significant relationship between long-term consequences such as increased future job opportunities and personal computer use. From an Internet use perspective, researchers should consider the relationship between the different types of Internet use and their future consequences. This type of analysis would afford policy makers with methods from which to promote the benefits of various types of Internet use.

Implications

By incorporating environmental factors, this study does build on previous research using SCT to understand Internet adoption. This knowledge presents new opportunities for old problems still facing the Internet. For example, the most common strategy implemented to understand and decrease the digital divide has been to provide access. By focusing on access, questions surrounding influences of adoption and level of adoption have been primarily ignored. The goal of this research was to increase understanding of Internet use by increasing understanding of relevant psychological variables. From this investigation, new approaches can be explored to (a) help those who have not adopted, (b) increase the use of current users, and finally, (c) understand how to increase different types of use. For example, in addition to providing access, demonstrating the success of others within an individual's social group will provide an added source for efficacy development. This type of reinforcement of use could increase encouragement among individuals; subsequently, increasing efficacy judgments and use.

Understanding this, policy makers can implement new methods to disseminate information about the Internet to novice and non-users. Here, in addition to providing Internet access, resources afforded to non-users should include support mechanisms. From a research perspective, creating Internet labs in setting with a large numbers of low users could provide individuals with access and the opportunity to vicariously observe others' successful Internet use. These labs could also be a source of encouragement from fellow lab users. Longitudinally tracking changes in use and support will provide a more complete understanding of user cognitive development over time.

Limitations

Several limitations of the study need to be considered in future tests of the model and/ or new approaches to understanding Internet use. First, all usage statistics are based on respondent recall. Some researchers have suggested that a better assessment can be obtained by electronically monitoring individual use (Kraut et al. 1999; Jackson, et al. 2000). However, the more advanced an Internet user becomes the more likely he/she is to encounter larger more cumbersome applications (e.g., audio and video files), causing usage estimates to be negatively skewed. Specifically, long download times and unlimited access (e.g., cable modems) present a problem for electronic monitoring. Second, while the sample was relevant for this investigation of Internet use, respondents were from a single high school; thus, the generalizability of the results toward other users of the same age group remains unanswered. Third, the sample was limited to one age group, preventing the findings from being generalized to a more general group of Internet users.

Forth, items should be added to all outcome expectancy measures; this would help to increase the reliability of each construct. For example, the entertainment outcome expectation construct was created with two items, forcing assumptions to be made with testing both internal consistency and parallelism. Another limitation deals with the reciprocal causation model specified in SCT. Without longitudinal data it is hard to distinguish cause and effect ordering (Pedhazur, 1982). The reciprocal causation is an important consideration with respect to the Internet, since the Internet itself is continually changing and no two destinations on the Internet are exactly alike. Internet users

therefore continually modify their Internet self-efficacy beliefs with each online experience.

Conclusion

In conclusion, this research has provided a number of contributions, the most significant being the inclusion of the environmental factors of Internet use. Researchers can use this study to hone and experimentally test influences of self-efficacy judgments and Internet use. Further, this study has identified the prominent constructs for a general model and possible individual models of Internet use. Based on these findings, research investigating distinct models of Internet use as well as the psychological consequences of Internet use can use social cognitive theory as a foundation for investigation.

Appendix A

1. How long have you used the Internet to gather information?

Never	½ year	1 year	1 ½ years	2 years	2 ½ years	3 years	3 ½ years	4 or more years

2. How long have you been playing video games on the Internet?

Never	½ year	1 year	1 ½ years	2 years	2 ½ years	3 years	3 ½ years	4 or more years

3. How long have you been listening to music on the Internet?

Never	½ year	1 year	1 ½ years	2 years	2 ½ years	3 years	3 ½ years	4 or more years

4. How long have you been meeting people (e.g., chat rooms and discussion groups) on the Internet?

Never	½ year	1 year	1 ½ years	2 years	2 ½ years	3 years	3 ½ years	4 or more years

5. How long have you been emailing people?

Never	½ year	1 year	1 ½ years	2 years	2 ½ years	3 years	3 ½ years	4 or more years

6. How long have you been participating in e-commerce (e.g., shopping online) on the Internet?

Never	½ year	1 year	1 ½ years	2 years	2 ½ years	3 years	3 ½ years	4 or more years

We would now like you to consider how others use of the Internet.

7. Think of a close friend, on an average **weekday (*Monday through Friday*)** how much time does that friend spend on the Internet at home?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

8. Considering that same friend, on an average **weekday** how much time does that friend spend on the Internet at school?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

9. Considering that same friend, on an average **Saturday** how much time does that friend spend on the Internet?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

10. Considering that same friend, on an average **Sunday** how much time does that friend spend on the Internet?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

11. Considering that same friend, how successful is that friend at using the Internet to complete school assignments?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

12. Considering that same friend, how successful is that friend at using the Internet for entertainment/ social purposes?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

13. Considering that same friend, how satisfied is that friend with how easy they are able to use the Internet for schoolwork?

1	2	3	4	5	6	7
Not at All Satisfied						**Completely Satisfied**

14. Considering that same friend, how satisfied is that friend with how easy they are able to use the Internet for entertainment/ social purposes?

1	2	3	4	5	6	7
Not at All Satisfied						**Completely Satisfied**

15. Does at least one of your parents use the Internet at work or at home (***please circle your response***)?

Yes No (if no, skip to question #24)

16. Think of your parent who uses the Internet the most, on an average **weekday**, how much time does that parent spend on the Internet at home?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

17. Considering that same parent, on an average **weekday**, how much time does that parent spend on the Internet at work?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

18. Considering that same parent, on an average **Saturday**, how much time does that parent spend on the Internet?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

19. Considering that same parent, on an average **Sunday**, how much time does that parent spend on the Internet?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

20. Considering that same parent, how successful is that parent at using the Internet at work related (for example information gathering) projects.

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

21. Considering that same parent, how successful is that parent at using the Internet at for entertainment/ social purposes?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

22. Considering that same parent, how satisfied is that parent with the ease at which they are able to use the Internet for work related projects?

1	2	3	4	5	6	7
Not at All Satisfied						**Completely Satisfied**

23. Considering that same parent, how satisfied is that parent with how easy they are able to use the Internet for entertainment/ social purposes?

1	2	3	4	5	6	7
Not at All Satisfied						**Completely Satisfied**

24. In general, how successful are kids your age at using the Internet to assist with their schoolwork?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

25. In general, how successful are kids your age at using the Internet for entertainment/ social purposes?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

26. In general, how often do you see people on television (including programs and commercials) use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

27. In general, how often do you see kids your age on television (including programs and commercial) use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

28. In general, how often do news programs show how the Internet is being used in an unfavorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

29. In general, how often do news programs talk about the Internet in a favorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

30. In general, how often do people on television (i.e., other than news programs) discuss the Internet in an unfavorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

31. In general, how often do you see people in movies use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

Now, we would like you to think about discussions you have had with various people about the Internet.

32. My friends encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

33. My friends tell me that the Internet is a terrible source for information.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

34. My friends talk with me about using the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

35. My friends discuss how being able to use the Internet will help me in the future.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

36. My friends tell me that there are a lot of fun things to do on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

37. My mom or dad does not encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

38. My mom or dad tells me that the Internet is a great source for information.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

39. My mom or dad does not talk to me about using the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

40. My mom or dad discusses how being able to use the Internet will help me in the future.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

41. My mom or dad tells me that there are a lot of fun things to do on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

42. In general, the people who are the most important to me encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

43. In general, most people I know think that Internet use is not important.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

44. In general, most people in society do not think that using the Internet is important.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

The following questions will ask you about the types of experiences and information you encounter while online. Given your past Internet experiences, please identify the likelihood of them happening to you when you use the Internet.

45. I am likely to establish a romantic relationship on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

46. I am likely to get immediate information about big news events on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

47. I am unlikely to meet new friends on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

48. I am likely to find a way to pass time on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

49. I am likely to find information to complete a class assignment on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

50. I am unlikely to have problems opening a large video file found online.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

51. I am likely to get in touch with people I know on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

52. I am likely to receive email I do not want.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

53. I am unlikely to have fun on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

54. I am likely to meet someone in person whom I met on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

55. I am likely to have long download times on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

56. I am unlikely to visit chat areas to talk with other people.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

57. I am likely to find current information like time, weather, stock prices, and sports scores on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

58. I am likely to have my computer freeze while I am searching the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly** Disagree

59. I am unlikely to get information about products such as cars or clothes on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

60. I am likely to find information that is current on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

61. I am likely to feel entertained on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

62. I am likely to be bored on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

63. I am likely to receive too much information when I am looking for something.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

64. I am likely to find that search engines don't have enough detail to quickly find what I am looking for.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

65. I am likely to have problems opening a large text document I find online.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

66. I am unlikely to have my personal information such as age, spending habits, sites I visit, etc. taken from my computer when I am surfing the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

67. I am likely to have problems opening a large audio file found online.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

68. While using the Internet I am likely to catch a computer virus.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

How do you feel about using the Internet? Internet use includes sending or receiving electronic mail, visiting chat rooms, participating in discussion groups and visiting sites on the World Wide Web. We would like you to answer each of the following questions even if you are not an Internet user.

69. I am confident understanding terms/words relating to Internet hardware.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

70. I am confident using the Internet to gather data.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

71. I am not confident understanding terms/words relating to Internet software.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

72. I am confident describing functions of Internet hardware.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

73. I am confident trouble shooting Internet related problems.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

74. I am confident explaining why a task will not run on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

75. I am confident learning advanced skills in a specific Internet program.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

76. I am confident turning to an on-line discussion group when help is needed.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

77. I am not apprehensive about using the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

78. The Internet is somewhat intimidating to me.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

79. I hesitate to use the Internet for fear of making a mistake I cannot correct.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

80. I'm afraid that I might destroy/ lose information on my computer by accessing corrupted files while on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

81. Using the Internet makes me nervous because I'm not sure how much personal information such as age, gender, sites I visit, etc. is being collected on me electronically.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Finally, we are interested in how often you currently use the Internet for various types of activities. Please read each questions carefully.

82. On an average **weekday** (***Monday through Friday***), how many hours do you use the Internet to gather information?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

83. On an average weekday, how many hours do you use the Internet to play video games?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

84. On an average **weekday**, how many hours do you use the Internet to listen to music?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

85. On an average **weekday**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

86. On an average **weekday**, how many hours do you use the Internet to email?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

87. On an average **Saturday**, how many hours do you use the Internet to gather information?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

88. On an average **Saturday**, how many hours do you use the Internet to play video games?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

89. On an average **Saturday**, how many hours do you use the Internet to listen to music?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

90. On an average **Saturday**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

91. On an average **Saturday**, how many hours do you use the Internet to email?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

92. On an average **Sunday**, how many hours do you use the Internet to gather information?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

93. On an average **Sunday**, how many hours do you use the Internet to play video games?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

94. On an average **Sunday**, how many hours do you use the Internet to listen to music?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

95. On an average **Sunday**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

96. On an average **Sunday**, how many hours do you use the Internet to email?

None	½ hour	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 or more hours

97. Do you have a computer at home?

_____yes _____no

98. Do you have Internet access at home?

_____ yes _____no

99. In general, where do you most often use the Internet?

a. Only outside my home (e.g., at school)
b. Mostly outside my house
c. About equally in my home and outside my home
d. Mostly in my home
e. Only in my home

Now, just a few personal questions.

100. Sex

1) Female
2) Male

101. What is your age _____

102. What ethnicity are you?

1) African American
2) Caucasian
3) Asian (including Chinese, Korean, Japanese and Southeast Asians)
4) Pacific Islander
5) Native American or Alaskan native
6) Spanish, Hispanic, or Latino
7) other? _____

Appendix B

First we would like you to think about how long you have been using the Internet.

1.How many years have you used the Internet for gathering information? _____year(s)

2. How many years have you been playing video games on the Internet? _____year(s)

3. How many years have you been listening to music on the Internet? _____year(s)

4. How many years have you been meeting people (e.g., chat rooms and discussion groups) on the Internet? _____year(s)

5. How many years have you been emailing people? _____year(s)

We would now like you to consider how others that you know use the Internet.

6. Think of a close friend, on an average weekday (Monday through Friday), how many hours does that friend spend on the Internet at home?

_____Hour(s)

7. Think of a close friend, on an average weekday, how many hours does that friend spend on the Internet at school?

_____Hour(s)

8. Think of a close friend, on an average weekend, how many hours does that friend spend on the Internet?

_____Hour(s)

9. Considering that same friend, how **successful** is that friend at using the Internet to complete school assignments?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

10. Considering that same friend, how **successful** is that friend at using the Internet for entertainment purposes (for example, Internet use that is not schoolwork related)?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

11. Considering that same friend, how **easy** is it for that friend to use the Internet for schoolwork?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

12. Considering that same friend, how **easy** is it for that friend to use the Internet for entertainment purposes (for example, Internet use that is not schoolwork related)?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

13. Does at least one of you parents use the Internet at work or at home (*please circle you response*)?

Yes (*if yes, continue with question 14*) No (*if no, skip to question #21*)

14. Think of your parent who uses the Internet the most, on an average weekday, how many hours does that parent spend on the Internet at home?

_____Hour(s)

15. Considering that same parent, on an average weekday, how many hours does that parent spend on the Internet at work?

_____Hour(s)

16. Considering that same parent, on an average weekend, how many hours does that parent spend on the Internet?

_____Hour(s)

17. Considering that same parent, how **successful** is that parent at using the Internet for work related (for example, information gathering) projects?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

18. Considering that same parent, how **successful** is that parent at using the Internet for entertainment (for example, Internet use that is not work related)?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

19. Considering that same parent, how **easy** is it for that parent to use the Internet for work related projects?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

20. Considering that same parent, how **easy** is it for that parent to use the Internet for entertainment (for example, Internet use that is not work related)?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

Now just a few general questions about how other are using the Internet.

21. In general, how **successful** are kids your age at using the Internet to help them with their schoolwork?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

22. In general, how **successful** are kids your age at using the Internet for entertainment purposes?

1	2	3	4	5	6	7
Not at All Successful						**Completely Successful**

23. In general, how **easy** is it for kids your age to use the Internet for schoolwork related projects?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

24. In general, how **easy** is it for kids your age to use the Internet for entertainment purposes (for example, Internet use that is not work related)?

1	2	3	4	5	6	7
Not at All Easy						**Completely Easy**

Now, just a few questions about other Internet related issues. *Please note that some items are negatively phrased!*

25. In general, how often do you see people on television programs and commercials (not including news programs) discuss the Internet in an unfavorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

26. In general, how often do you see people on television programs and commercials (not including news programs) use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

27. In general, how often do you see kids your age on television and commercials (not including news programs) use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

28. In general, how often do news programs show how the Internet is being used in an unfavorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

29. In general, how often do news programs talk about the Internet in a favorable way?

1	2	3	4	5	6	7
Not at All						**A lot**

30. In general, how often do you see people in movies use the Internet to help them?

1	2	3	4	5	6	7
Not at All						**A lot**

Now we would like you to think about discussions you have had with various people about the Internet. ***Please not that some of the items are negatively phrased!***

31. My friends encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

32. My friends tell me that the Internet is a terrible source for information.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

33. My friends discuss how being able to use the Internet will help me in the future.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

34. My friends talk with me about using the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

35. My friends tell me that there are a lot of fun things to do on the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

36. My mom or dad tells me that the Internet is a great source of information.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

37. My mom or dad does NOT encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

38. My mom or dad tells me that the Internet is a great source for information.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

39. My mom or dad does NOT encourage me to use the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

40. My mom or dad discusses how being able to use the Internet will help me in the future.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

41. My mom or dad tells me that there are a lot of fun things to do on the Internet.

1	2	3	4	5	6	7
Strongly Disagree						**Strongly Agree**

The following questions will ask you about the types of experiences and information you encounter while online. Given your Internet experiences, please identify the likelihood of each of them happening to you when you use the Internet. ***Please not that some of the items are negatively phrased!***

42. I am likely to establish a romantic relationship on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

43. I am likely to get immediate information about big news events on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

44. I am NOT likely to meet new friends on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

45. I am likely to find a way to pass time on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

46. I am likely to find information to complete a class assignment on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

47. I am likely to get in touch with people I know on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

48. I am likely to receive email I do not want.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

49. I am NOT likely to have fun on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

50. I am likely to meet someone in person whom I first met on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

51. I am likely to have long download times on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

52. I am NOT likely to visit chat areas to talk with other people.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

53. I am likely to find current information like time, weather, stock prices, and sports scores on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

54. I am likely to have my computer freeze up while I am on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

55. I am likely to get information about products such as cars or clothes on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

56. I am likely to be entertained on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

57. I am likely to be bored on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

58. I am likely to receive too much information when I am looking for something on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

59. I am likely to find that search engines do NOT have enough detailed to quickly find what I am looking for.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

60. I am likely to have problems opening large text documents found online.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

61. I am likely to have problems opening an audio file (for example, a music file) found online.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

62. While using the Internet I am likely to catch a computer virus.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

Internet use includes sending and receiving email, visiting chat rooms, participating in discussion groups and visiting sites on the World Wide Web. We would now like you to answer each of the following questions even if you are not an Internet user. ***Please note that some of the items are negatively phrased!***

63. I am confident understanding terms/words relating to Internet hardware.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

64. I am confident understanding terms/words relating to Internet software.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

65. I am confident describing functions of Internet hardware.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

66. I am confident trouble shooting Internet problems.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

67. I am confident explaining why a task will not run on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

68. I am confident using the Internet to gather data.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

69. I am confident learning advanced skills in a specific Internet program.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

70. I am confident turning to an online discussion group when help is needed.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

71. I am not apprehensive about using the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

72. The Internet is somewhat intimidating to me.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

73. I hesitate to use the Internet for fear of making a mistake I cannot correct.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

74. I'm afraid that I might destroy/ lose information on my computer by accessing corrupted files while on the Internet.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

75. Using the Internet makes me nervous because I'm not sure how much personal information (for example, age, gender, sites I visit, etc.) is being collected electronically.

1	2	3	4	5	6	7
Strongly Agree						**Strongly Disagree**

76. On an average **weekday** (***Monday through Friday***), how many hours do you use the Internet to gather information?

_____hour(s)

77. On an average **weekday**, how many hours do you use the Internet to play video games?

_____hour(s)

78. On an average **weekday**, how many hours do you use the Internet to listen to music?

_____hour(s)

79. On an average **weekday**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)?

_____hour(s)

80. On an average **weekday**, how many hours do you use the Internet to email?

_____hour(s)

81. On an average **weekend**, how many hours do you use the Internet to gather information?

_____hour(s)

82. On an average **weekend**, how many hours do you use the Internet to play video games?

_____hour(s)

83. On an average **weekend**, how many hours do you use the Internet to listen to music?

_____hour(s)

84. On an average **weekend**, how many hours do you use the Internet to meet people (e.g., chat rooms and discussion groups)?

_____hour(s)

85. On an average **weekend**, how many hours do you use the Internet to email?

_____hour(s)

86. Do you have a computer at home?

_____yes _____no

87. Do you have Internet access at home?

_____ yes _____no

88. In general, where do you most often use the Internet?

a. Only outside my house (e.g., at school)
b. Mostly outside my house
c. About equally in my home and outside my home
d. Mostly in my home
e. Only in my home

89. Sex

a. Female
b. Male

90. What is your age _____

91. What ethnicity are you?

1) African American
2) Caucasian
3) Asian (including Chinese, Korean, Japanese and Southeast Asians)
4) Pacific Islander
5) Native American or Alaskan native
6) Spanish, Hispanic, or Latino
7) other? _____

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