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INTERNET USAGE AMONG COLLEGE STUDENTS AND ITS IMPACT ON DEPRESSION, SOCIAL ANXIETY, AND SOCIAL ENGAGEMENT

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Psychology

Kimberlee D. DeRushia

Indiana University of Pennsylvania

May 2010

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ABSTRACT

Title: Internet Usage among College Students and its Impact on Depression, Social Anxiety, and Social Engagement

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The Internet provides an opportunity for individuals to interact with friends and family members, to research any topic they can imagine, and to explore the world while sitting in the comfort of their own home. The popular media suggests that Internet usage decreases the amount of social interaction individuals have with the world outside of their computer and may be accompanied by social anxiety, loneliness, lowered self-esteem, or chronic depression, and the psychological literature's mixed findings on these topics have not helped clarify the issue. This study looked at the impact that Internet usage has on an individual's psychological well-being in an effort to clarify and expand on the previous research.

Participants in this study were undergraduates at a state university in rural Pennsylvania. Participants were randomly selected through a psychology department subject pool. They completed several psychological questionnaires and tracked their Internet usage and social engagement for a seven-day period. Results indicated that time spent on the Internet was not predictive of depression, social anxiety, or social engagement in face-to-face relationships or online relationships. The type of activity engaged in online was also not predictive of depression, social anxiety, or social

engagement in face-to-face relationships or online relationships. However, results indicated that there was a significant difference in the way that participants responded to measures of social anxiety when referencing face-to-face relationships as opposed to online relationships. Limitations included not tracking ethnicity of participants, an unequal distribution of gender across the population, and that the population was restricted to undergraduate students in a rural setting. Based on these results, future research would benefit from exploring differences in individual's perceptions of online relationships compared with face-to-face relationships, and from exploring similar questions in non-college aged, ethnically diverse populations with gender equally distributed across the sample.

ACKNOWLEDGMENTS

Although the final product of a dissertation has just one name on the front cover, in my experience at least, it takes an entire village of people to bring one to fruition. This dissertation was a herculean task that I occasionally considered abandoning and if it had not been for the encouragement, support, and even once or twice outright pushing, from Jamie Brass, Steven Behling, Jessica Buckland, Karen Graves, Hey-Mi Ahn, Marc Palmer and my dad, John DeRushia, I'm not certain that I would have ever finished. Thank you each for understanding the process and being there when I needed someone to lean on.

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CHAPTER 1

INTRODUCTION

Statement of the Problem

The Internet has become an integral part of Western society, with approximately 72.5% of the population of the United States using the Internet on a regular basis (Internet World Stats, 2008). With only a click of the mouse, the Internet allows individuals to learn information about almost any topic they care to research, and to communicate with or learn about future romantic partners, prospective employees, long-lost friends, or family members (Davis 2007; Kraut et al., 2002; Teske, 2002; White, 2007). The present study investigated the effect of Internet use on social interaction with particular attention to the levels of social anxiety, and depression experienced by college students who engage in frequent, non-academic Internet use.

In 2005, the primary researcher noticed a social pattern reported by college freshmen and sophomores presenting for therapy at a rural university counseling center. In particular, these students frequently reported that they were more comfortable talking to their friends using technology such as the Internet or text messaging on their cell phones, than traditional forms of communication such as face-to-face conversations or speaking on the telephone. Anecdotally, a particular client reported that she frequently "froze up" and was unable to have an in-person conversation with her male friends but had no difficulty "talking" with text via a computer instant messaging program.

There is a paucity of psychological literature concerning college student use of Internet social networking is available and those studies that are available are contradictory in nature (Brignall & Van Valey, 2005; Kraut et al., 1998, 2002; Odell, Korgen, Schumacher & Delucchi, 2000; Ybarra, 2004). The popular media, who are more consistent about the issue, repeatedly infers that Internet use impairs social interaction and that increased use may even lead to chronic depression and clinical levels of social anxiety in traditional social situations (CBS News, 2007; Fox News, 2007; Geldof, 2007; USA Today, 2007). The dissimilarity between these two bodies of literature and the seeming confusion within empirical investigations of the topic was in need of clarification. That is: is the increase in Internet use, particularly among younger individuals for social contact harmful? This is of particular concern as a recent study reported that 89% of individuals between the ages of 18 and 24 residing in the United States engage in Internet use daily (Jones & Fox, 2009, p. 2). However, it is unclear whether accessing one's social world online negatively impacts one's face-to-face social relationships and mental health.

The Purpose of the Study

The purpose of the present study was to clarify these discrepant portrayals of Internet use for social communication by exploring the impact of Internet use on social engagement in a college-aged population with particular attention to symptoms of social anxiety and depression. This study investigated three primary questions in addressing the disparate portrayals of the effect of Internet based social interactions: 1) Can the amount of time spent and the level of social interaction for which a person uses the Internet predict loneliness, level of social interaction, and social anxiety in

offline settings/face-to-face relationships, and loneliness and social anxiety in online relationships; 2) Can the amount of time spent the Internet, or the amount of social interaction engaged in online predict participants' reported levels of depression; and 3) Does the gender of the participant make any difference on the amount of time spent on the Internet, their social interaction online, or their reported levels of depression?

CHAPTER 2

REVIEW OF THE LITERATURE

The Internet and Related Terms

In 1995, the term Internet was officially defined as "the global information system that is logically linked together by a globally unique address space based on the Internet Protocol (IP), that is able to support communications using Transmission Control Protocol/Internet Protocol (TCP/IP) and provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure" (Federal Networking Council, 1995, p. 1). However, when individuals talk about the Internet, they are typically referring to more than this technical definition.

When individuals access the Internet they typically do it via the World Wide Web (web). The web is actually a collection of electronic documents that are stored on computers throughout the world (World Wide Web, 2002; Howe 2007). Through the use of a web browser these documents can be easily accessed by anyone who knows what to look for and are frequently identified through the use of search engines designed to access these documents based on key words (Search Engine, 2009). This information can then be communicated to others through the use of email or instant messaging/chat programs. Email is an electronic message that is sent and/or received over a system that is designed specifically for the transmission of electronically written messages between computers (Email, 2009; Howe, 2007). Due to its virtually instantaneous delivery, email is a quick and easy form of communication that individuals use for professional and personal reasons throughout their day.

Communication also happens on the Internet through instant messaging programs and Internet Relay Chat (IRC). Instant messaging programs are designed to allow real time conversation to occur between individuals who access the same service by means of a program installed on their personal computers (Instant messaging, 2009; Howe 2007). Similar to instant messaging, IRC allows real time conversation to occur between groups of individuals in locations typically referred to as "chat rooms" through a worldwide network of computers (IRC, 2009; Howe, 2007). In the last decade with the advent of social networking sites, a new form of communication has emerged on the Internet. Social networking sites, such Facebook or Twitter, are typically websites designed to allow individuals to publish information about themselves, with the intention of sharing that information with others in a way that doesn't require direct conversation (Howe, 2007).

The Internet has expanded in ways that were not foreseeable at its inception. As the tools that are used to access the Internet increase, so do the number of online activities and the amount of time spent engaging in online activities. This is particularly true for younger generations, as represented by the statistics presented in a recent Pew Internet Survey that reported 83% to 87% of individuals ages 18 to 49 use the Internet compared with 65% of individuals age 50 to 64 and 32% of individuals age 65+ (Pew Internet Tracking Survey, 2007a). The types of activities that individuals report engaging in most often online are sending or reading email (56%), searching for information (41%), getting news (37%), looking for information on a hobby or other interest (29%), or browsing websites for fun (28%) (Pew Internet Tracking Survey, 2007b). These statistics are particularly salient for younger

generations who have grown up with the Internet as part of their daily lives and cannot imagine a time when constant contact to the world via the Internet did not exist.

Gender Differences and the Internet

Although both genders reported equal use of the Internet in a Pew Internet Tracking Survey (2007a), the psychological research of Internet usage presents mixed results when looking at gender differences. An Odell, Korgen, Schumacher & Delucchi (2000) study measured the responses of 843 students at five public institutions and three private institutions to compare Internet usage and gender. Participants were asked basic demographic questions, including major and year in college, and Internet related questions including amount of access to the Internet while growing up, how much time they currently spent on the Internet, and why they accessed the Internet. The study reported that for public institutions, there were no gender differences in the amount of time spent on the Internet, and that at private institutions males spent significantly more time online than females ($p = 0.019$). However, Odell and colleagues (2000) reported gender differences when examining the specific activities or services accessed. Females spent significantly more time checking email ($p = 0.015$), and conducting research for school ($p = 0.002$), while their male counterparts spent significantly more time researching purchases ($p = 0.002$), visiting sex sites ($p < 0.001$), reading news ($p < 0.001$), playing games ($p < 0.001$), and listening to or downloading music ($p < 0.001$). A study by Sabrina Neu (2009) looked at gender and perceptions of boredom, social interaction and social anxiety among 200 college students ranging in age from 18 to 30 who reported

playing online multiuser games such as *World of Warcraft*. Participants completed self-report measures online that measured levels of social interaction, social anxiety, and boredom (Neu, 2009). Neu reported that in her study males spent significantly more time playing online games than females ($p = 0.05$) but were not more likely to report levels of boredom, social anxiety or decreased social interaction when compared with females. Another study by Michele Ybarra (2004) reviewed the information collected by the Youth Internet Safety Survey between September 1999 and February 2000. Out of 1,489 participants 72% of respondents reported experiencing at least one incident of online harassment, defined as feeling threatened or embarrassed by others on the Internet Ybarra, 2004). When Ybarra looked at gender differences within the survey she found a correlation between depression and Internet use among males, especially regarding online harassment but found no correlation between harassment on the Internet and depression for females. Thus, an increase in Internet use may be associated with gender differences in regard to both symptoms of depression and the types of activities for which the Internet is used (Neu, 2009; Ybarra, 2004).

Social Engagement and the Internet

Social engagement, as defined by this study is the quality and number of interactions that an individual has with others on a regular basis. These interactions can be with family members, peers, and members of their social or personal communities and have the result of forming a cohesive group that makes the individuals feel a sense of belonging (Canadian Council on Social Development, 2006; Fiske, 2004 p. 460; Thibault & Kelley, 1986, p. 60; Watters, 2003 p. 104).

Over the last six years, social engagement has expanded to include the Internet through the use of social networking (Sellers, 2006, para. 5). Social networking online is typically accomplished through sites that allow individuals to search for others that have the same interests, establish friendships, and reconnect with friends from their past (Luo, 2007, para. 1). The impact of the Internet on social engagement is frequently discussed in both popular media and in the psychological literature in negative light.

In the psychological literature one meta-analysis has posited that as individuals become more accustomed to interacting through the Internet there will be negative consequences on their ability to communicate appropriately in face-to-face situations (Brignall & Van Valey, 2005). Additionally, a study that focused on college students asked 649 men and 647 women about their Internet use and found that the students who reported greater levels of Internet use also reported that, in addition to a decrease in their amount of daily sleep ($p = 0.05$) and lower grades academically ($p = 0.05$), they also perceived fewer opportunities to interact with individuals in face-to-face situations (Anderson, 2001). Another study that focused on adolescent use of the Internet asked 52 female high school seniors and 37 male high school seniors to complete several self report measures concerning Internet use, quality of relationships, and depression (Sanders, Field, Diego & Kaplan, 2000). Sanders and colleagues (2000) found that higher levels of Internet use were associated with declines in face-to-face relationships with both friends and mothers when compared with adolescents that used the Internet less than one hour per day ($p = 0.01$). Finally, a recent study that asked 300 participants of an online multiplayer

role playing game to complete measures of social engagement and social anxiety found that individuals were likely to report that as a result of high levels of Internet use they had missed meals, decreased their amount of sleep, were more likely to argue with friends and/or family members and perceived that their face-to-face social life had suffered as a result (Neu, 2009).

In addition to the negative effects of Internet use on social engagement, the psychological literature on this topic has also found both neutral and positive results concerning the impact of Internet usage on social engagement. In 1998, a comprehensive study of the topic occurred at Carnegie Mellon University (Kraut et al, 1998). These researchers conducted a longitudinal study that gave computers and Internet access to 93 families (256 individuals) in the Pittsburgh, Pennsylvania area who had not previously had such access. Participants completed measures of anxiety, depression, and social activity before they were given Internet access and then again after they had been given access. The study authors reported that higher amounts of Internet usage were correlated with declines in communication, and with smaller social networks (Kraut et al, 1998). However, in contrast to this earlier study, a follow-up study conducted in 2002 by the same researchers with 208 of the original participants found that there were no correlations between Internet usage, communication, and social networks and attributed this change in findings potentially to maturation in their participants over time or as a result of the Internet changing to be more socially inclined (Kraut et al. 2002 p. 69). Additionally, a study completed by Eric Weiser (2000) had 140 males and 295 females from a student population (n = 134) and an online population (n = 301) complete several measures of well-being via

the World Wide Web (Weiser, 2000). Weiser found that when the Internet is used primarily for social activities there was a decline in psychological well-being of the individual and when it was used primarily for non-social activities it resulted in an increase in psychological well-being (Weiser, 2000, p.257). Conversely, other studies investigating the effects of Internet use on communication and levels social interaction reported that college students who chatted anonymously on the Internet over a period of four to eight weeks were more likely to report at the end of the study that their perceptions of social support increased, and that individuals who used chat rooms on a regular basis scored lower on measures of social fearfulness than non-chat users (Campbell, Cumming, & Hughes 2006; Shaw & Gant 2002). A Madell and Muncer (2007) study that focused on the use of communication and social interactions reported that individuals preferred to use email and instant messaging when communicating emotion-laden concerns in particular. Thus, the relational consequences of Internet communication may differ by the type of conversation facilitated.

Articles in the popular media frequently focus on the negative interactions that are caused by use of the Internet. An example of this was seen on July 15, 2007 when several articles were written in the popular media about a parenting couple from Reno, Nevada who had neglected their children in order to play online games (CBS News, 2007, para. 1; Fox News, 2007, para. 1; USA Today, 2007, para. 1). The prosecutor in that case stated that the couple was "too distracted by online games … to give their children proper care" (USA Today, 2007, para. 4). The outcome of the prosecution of this case has not been determined at this date. Similarly, a recent

editorial begins with “MySpace is ruining my social life” and continues to elucidate the opening statement by detailing how the author no longer goes out with friends, preferring instead to stay at home and improve her MySpace page (Geldof, 2007, para. 1). An article in Time magazine in 2008 stated that the social aspects of the Internet, namely the ability to comment on articles that are posted, result in individuals being “cruel” and “loathsome” and posits that this is due to illusion of anonymity online and a general disregard of cultural restraints (Grossman, 2008, para. 2 and 3). In contrast to these media accounts is an editorial in *Primary Psychiatry* which recommended that social networking sites be used to connect professionals in healthcare fields in order to take advantage of the ways that these sites allow individuals to interact with their peers and exchange information with ease (Luo, 2007).

The connection between Internet use and social engagement has received mixed results in both the popular media and the psychological research. Some studies have found that increased use of the Internet leads to a decrease in social engagement (Anderson, 2001; Kraut et al., 1998), while others have found that increased use leads to increased social engagement (Campbell et al., 2006; Kraut et al, 2002; Madell & Muncer, 2007; Sanders et al., 2000; Shaw & Gant, 2002). This mixture of results may be due to the relative lack of research literature and the instinctive response that guides most popular media to suppose that increased use of the Internet would result in decreased social engagement. Such “common sense” may not stand up to scrutiny when compared with stringent research.

Social Anxiety and the Internet

Some writers have suggested that an increase in Internet use is associated with symptomatology consistent with social anxiety (Amichai-Hamburger, Wainapel, & Fox, 2002; Caplan, 2007). Social anxiety is characterized by fear of social situations that could lead to intense social scrutiny if the individual behaves in a manner that is humiliating or embarrassing (American Psychiatric Association, 2000). Prevalence rates of social anxiety reportedly range from 3% to 13%, with most individuals reporting social anxiety in situations that require public speaking or meeting new people (American Psychiatric Association, 2000; Turk, Heimberg, & Hope, 2001).

The popular media frequently implies that the Internet is useful for individuals with social anxiety because it gives individuals experiencing social anxiety a place to practice social skills and increase confidence (Cuncic, 2009, para. 3) and it's a safe place to form new friendships without the pressure of immediately responding to social cutes (Ayushveda, 2008, para. 6; Sorryforsilence, 2009). The A study that investigated individuals who experience social anxiety symptoms reported that individuals who attained higher scores of social anxiety were less likely to spend time online than those with lower levels of social anxiety (Madell & Muncer, 2006). Similarly, another study reported that the amount of time spent in chat rooms did not have an impact on the levels of anxiety reported by participants, but that those who participated tended overall to be less socially anxious than those who did not spend time in chat rooms on the Internet (Campbell et al., 2006). A similar finding of no significant effect for social anxiety and Internet use was also seen in a study that

looked at online game playing and the self-reported levels of social anxiety (Neu, 2009). Taken together, these studies suggest that socially anxious individuals do not use the Internet for interpersonal communication as is assumed in the popular media. Conversely, a study investigating participants' ability to express their "real self in a social environment" reported that high scores on measures of introversion and neuroticism were associated with a greater comfort being their "real self" on the Internet, compared to ratings that were high on extroversion and low on neuroticism being associated with being more comfortable in face-to-face social situations (Amichai-Hamburger et al. 2002). This finding concerning introversion was also reported in a study conducted by Scott Caplan (2007) who reported that high social anxiety was predictive of individual preference for online social interaction to face-to-face social interaction.

Intuitively it makes sense that individuals who experience anxiety in social situations would be more comfortable on the Internet where the perception of anonymity allows individuals to present only what they want others to see. However, given the psychological research, it remains to be seen if this intuitive reaction concerning social anxiety is something that can be adequately measured.

Depression and the Internet

Depression is one of the most common mental health disorders and is diagnosed when individuals experience a depressed mood most of the day, show a diminished interest in pleasurable activities, report changes in appetite, and in levels of concentration, and have feelings of worthlessness or guilt (American Psychiatric Association, 2000; Young, Weinberger, & Beck, 2001). The prevalence of Major

Depressive Disorder (which requires the presence of at least one episode of depression) reportedly ranges from 10% to 25% in females and from 5% to 12% in males (American Psychiatric Association, 2000).

A study conducted at Carnegie Mellon in 1998 originally reported that increased Internet use was correlated with an increase in reports of loneliness and depression; however, the follow-up study conducted 4 years later found that there was no correlation between Internet use and depression and is consistent with a study that found no link between adolescent use of the Internet and levels of depression (Kraut et al., 1998, 2002; Sanders et al., 2000). Furthermore, a study on the relationship between Internet communication and depression reported that over the course of four to eight weeks, college students chatting anonymously on the Internet were more likely to report fewer feelings of loneliness and depression than they had before the study began (Shaw & Gant, 2002). Based on the scant psychological literature, it appears that the amount of time spent online does not impact levels of depression but that there are other aspects of Internet use that may play a role. A Morgan and Cotton (2003) study found that the type of activity engaged in on the Internet was implicated in levels of depression among college students, and that when the Internet was utilized for communication, levels of depressive symptoms decreased, particularly for male respondents. However, when the Internet was utilized for non-communication oriented activities such as shopping or research, levels of depressive symptoms increased (Morgan & Cotton, 2003). Another study reported that, rather than the type of activity, or the amount of time spent on the Internet, depressive symptoms were eight times more likely to be reported by males who also reported experiencing

harassment on the Internet (Ybarra, 2004). Finally, a Campbell, Cumming & Hughes (2006) study indicated that depressive symptoms were associated simply with frequent Internet use, regardless of the amount of time or activity, suggesting that those who reported spending time on the Internet were more likely to report depressive symptoms than those who report not spending time online.

The psychological literature is scant on the topic of depression and Internet use and, as with social engagement and social anxiety, the literature that does exist is contradictory in nature. The overall consensus is that an increase in Internet use is not implicated in an increase in levels of depression. In fact, the result of an increase in reported depressive symptoms from Internet use is currently undetermined, with some studies implicating gender, others implicating the type of activity engaged in online and still others stating that it's simply that chronically depressed individuals are more prone to using the Internet than non-depressed individuals (Campbell et al., 2006; Morgan & Cotton, 2003; Ybarra, 2004)

Hypotheses

This study investigated three primary questions to address this topic: 1) Can time spent and amount of social interaction online predict loneliness and social anxiety in face-to-face settings, loneliness and social anxiety in online settings, and social interaction in face-to-face settings; 2) Can Internet use, or social interaction online, predict participants' levels of depression; and 3) Does gender influence the amount of time spent online, the type of activities accessed online, or participants level of depression.

Hypothesis one. To address question one, Hypothesis 1a posits that Internet use will predict a significant amount of the variance in participants' loneliness and social anxiety in face-to-face settings, loneliness and social anxiety in online settings, and social interaction in face-to-face settings. Internet use will be positively related to loneliness and social anxiety in face-to-face settings; higher levels of Internet use will be associated with increased social anxiety in face-to-face settings, and increased loneliness in face-to-face settings. Internet use will be negatively related to loneliness in an online setting, lower levels of social anxiety in an online setting, and lower levels of social interaction in face-to-face settings. Hypothesis 1b posits that the amount of social interaction online will significantly increase the amount of variance in participants' loneliness and social anxiety in face-to-face settings, loneliness and social anxiety in online settings, and social interaction in face-to-face settings. Socially oriented Internet activities will be negatively related to social engagement in face-to-face settings, loneliness in online settings, and social anxiety in online settings. Socially oriented Internet activities will be positively related to social anxiety in face-to-face settings, and loneliness in face-to-face settings.

Hypothesis two. To address question two, Hypothesis 2a posits that Internet use will predict a significant amount of the variance in participants' levels of depression. Internet use will be positively related to depression; higher levels of Internet use will predict higher levels of depression. Hypothesis 2b posits that the amount of social interaction online will predict a significant amount of the variance explained in participants' levels of depression. The amount of social interaction

online will be negatively related to depression with higher levels of social interaction online predictive of lower levels of depression.

Hypothesis three. To address question three, Hypothesis 3a posits that there will be gender differences in the amount of time individuals spend on the Internet. Men will spend more time than women on the Internet. Hypothesis 3b posits that there will be gender differences in the amount of social interaction online. Women will spend more time engaging in social activities online than men. Hypothesis 3c posits that there will be gender differences in the level of depression reported by participants. Men will demonstrate higher levels of depression than women.

CHAPTER 3

METHOD

Participants

Sixty-eight female and 31 male undergraduate students attending a state university located in rural Pennsylvania served as participants in the current study. These participants had enrolled in the Psychology Department's subject pool to fulfill their general psychology course research requirement. All participants were randomly selected by the subject pool coordinator and were subsequently emailed an initial request to participate and sent a second email invitation to participate if they did not respond to the first request. Students who did not respond to either email request were invited to participate via a subsequent telephone contact. All participants were informed of the nature of the study and the time commitment expected when invited to participate. The names of students who declined participation were returned to the subject pool.

Participants were required to sign an informed consent form (Appendix A) by which they were again informed of the time commitment and given the opportunity to opt out of the study. Of the initial 150 students contacted for participation, 138 initially chose to participate in this study and 99 students completed all three phases of the study.

Materials

Six measures were used in this study: an experimenter-developed demographic questionnaire (Appendix B), an experimenter-developed self-report measure of Internet usage (Appendix C), two measures of social engagement: one

that measured day-to-day social interactions (Appendix D) and one that measured perceptions of loneliness (Appendix E), one questionnaire concerning social anxiety symptoms (Appendix F), and one questionnaire measuring symptoms of depression (Appendix G).

Demographic questionnaire. The demographic questionnaire (Appendix B) consisted of 10 questions that included participants' current academic standing, gender, family income and parental levels of education (Braveman, Cubbin, Marchi, Egerter, & Chavez 2001). This questionnaire also assessed participants' current ability to access the Internet and the typical locations of their access. Additionally, the demographic questionnaire asked participants to list the three most important activities in which they engage on the Internet.

Measure of Internet usage. The Internet Usage Tracking Chart (Appendix C, parts 1 and 2) consisted of a grid designed to allow participants to quickly check off the hours they engaged in Internet usage in a 24-hour period. Individuals were instructed to round off times of use to the nearest hour and enter their responses into an online computer database they were instructed to access each evening from a personal computer. After tracking their Internet use for one week, participants were given a series of questions that required them to estimate the amount of time they spent studying and using the Internet, and to rank-order 13 potential activities (e.g., email, social networking, gambling, etc.) in which they engaged while online. This rank order list was then used to determine if the type of Internet activities accessed by each participant were of a social or solitary nature by assigning each item a social or

non-social value and weighting the value based on the rank assigned by the participant.

Measures of social engagement. The Social Rhythm Metric (SRM) (Appendix D) consists of 17 events that occur in an individual's life over the course of a day, and was designed to assess social support and social networks of an individual. Participants keep track of when each activity occurred, who was present during the activity, and their own level of involvement. Individuals were asked to manually track these 17 activities and enter them into an online computer database each evening from a personal computer. These items include when participants get out of bed each morning, when they have meals and when they participate in activities such as school, exercise, or watching television. For each item the participant is asked to enter the time the item was completed, whether or not they were alone at the time, and, if others were present, whether they were "*just present*" or "*actively involved*". The SRM is calculated using an algorithm found in Monk, Kupfer, Frank, & Ritenour (1990) and several indices can be calculated including active social engagement, and minimal to no social engagement (Carney, Edinger, Meyer, Lindman & Istre, 2006). The test-retest reliability for the SRM is moderate with a significant correlation between week 1 and week 2 (rho=0.60, $p < 0.001$) (Monk, Petrie, Hayes & Kupfer, 1994). Additionally the SRM has been described as a valid instrument by several studies and in a personal communication by the creator of the measure (Haynes, Ancoli-Israel, & McQuaid, 2005; Meyer & Maier, 2005; T.H. Monk, personal communication, July 23, 2009; Monk, et al., 1994; Monk, Frank, Potts, & Kupfer, 2002; Monk, Kupfer, Frank, & Ritenour, 1990).

The UCLA Loneliness Scale, Version 3 (Appendix E) is also a measure of social engagement. It consists of 20 questions that are answered on a 4-point Likert scale ranging from 0 (*never*) to 4 (*often*). Questions address how the individual feels in regard to companionships. Scores range from 20 to 80 with higher scores indicating greater degrees of loneliness. Cronbach's α for the UCLA Loneliness Scale, Version 3 ranges from 0.89 to 0.94 and has a test-retest validity of 0.73 over a 1-year period (Russell, 1996).

Measure of depression. The Center for Epidemiological Studies Depression Scale (CES-D) (Appendix F) measures levels of depression in a general population (Radloff, 1977). It consists of 20 questions rated on a 4-point Likert scale that ranges from 0 (*rarely or none of the time)* to 4 (*most or all of the time).* Possible scores range from 0 to 60 with higher scores indicating greater levels of depression symptoms. Internal consistency for the general population is in the good range with Cronbach's α of 0.85 (Hann, Winter, & Jacobsen, 1999).

Measure of social anxiety. The Brief Fear of Negative Evaluation, Revised (BFNE-II) (Appendix G) is a measure of social anxiety that consists of 12 questions answered on a 5-point Likert scale. Responses range from 0 (*not at all characteristic of me*) to 4 (*extremely characteristic of me).* Scores range from 0 to 48 with higher scores reflecting greater levels of social anxiety (Carleton, McCreary, Norton, & Asmundson, 2006). Internal consistency for this measure is in the excellent range with item coefficients between 0.94 and 0.95 and an overall Cronbach's α of 0.95 (Carleton et al, 2006)

Procedures

Selecting participants. All participants were randomly selected by the subject pool coordinator and contacted via email or telephone to request their participation in this study. All participants were informed of the nature of the study and the time commitment involved at the time of first contact and given the opportunity to decline participation. Students electing to participate were met by an assistant experimenter who explained the time requirements of the study and again gave participants the chance to decline participation. Those who elected to participate were required to sign an informed consent form (Appendix A). Participants were informed that the researcher was looking for possible connections between Internet usage, psychological well-being, and relationships. No deception was used during this study. Additionally, participants were given a resource sheet for campus and community referrals (Appendix I) as a precaution should they experience feelings of concern when completing the study measures.

Phase one. After signing the informed consent form, participants were directed to a university computer with Internet access where they completed the demographic questionnaire and the measures of depression (CES-D), social anxiety (BFNE-II), and one of the social engagement measures (UCLA Loneliness scale). Participants were asked to complete the BFNE-II and UCLA Loneliness Scale twice. The first time they completed these two measures they were asked to focus on face-to-face relationships, the second time the focus was on online relationships. Participants were asked to consider face-to-face and online relationships separately in order to determine if there was a difference in their perception of experienced anxiety

or loneliness based on the population with which the participant was interacting. Participants completed this first phase of the study in approximately 30 minutes.

Phase two. After completing these psychological measures, participants were given verbal directions for tracking their Internet use and daily social interactions. Additionally, they were instructed in how they were to enter their Internet use and social interactions online using their personal computers. Participants were also given paper copies of the measures to aid in their ability to keep track of their interactions while not at a computer. Finally, an email reminder was sent from the Applied Research Lab, a campus department devoted to assisting in research, to participants each day for seven days to prompt participants to respond. This email reminder was based on the email contact address provided by the subject and was not tied to specific results in order to protect confidentiality of responses. It is estimated that this aspect of the study took approximately 15 minutes each evening for the course of seven days.

Phase three. At the end of seven days, participants were sent an email with a link to access the final part of the study, a questionnaire (Appendix C, part 2) that asked participants to estimate the amount of time they spent studying and using the Internet, and to rank-order 13 potential activities in which they engaged while online. After answering these questions, participants were thanked and debriefed (Appendix H) online and provided with the experimenter's contact information should they wish to receive the results of the study. Additionally participants were again provided with a copy of local community and campus resources (Appendix I) to access if they felt

concerned about any of the information that they were prompted to think about over the course of this study.

CHAPTER 4

RESULTS

Descriptive Statistics

Out of the 150 individuals that were originally approached to participate in this study, 12 declined to participate after being informed of the time commitment for this study. Of the remaining 138 individuals, 99 successfully completed all three phases of the study and were included for analysis. Of the 99 participant scores included in the analyses, 31 (31.3%) were male and 68 (68.7%) were female. A chi-square test of goodness-of-fit was performed to determine if the differences in group size for sex of participant significantly different. Sex was not equally distributed across the population, X^2 (1, n=99) = 13.828, $p < 0.001$. This means that possible gender effects may not have been detected due to the difference in group sizes.

The majority of the sample was comprised of college freshmen, with 87 (87.9%) of the participants in their first year of college at the time of this study, nine (9.1%) were sophomores, two (2%) were juniors, and one student (1%) reported being a continuing education student. Participants reported that they were in 43 different majors, with 16 (16.2%) listing their major as undecided. The majority of participants with chosen majors were in the college of Health and Human Services (24.2%), with 18.2% in the college of Natural Sciences and Mathematics, 15.2% in the college of Business and Information Technology, 15.2% in the college of Education and Education Technology, 10.1% in the college of Humanities and Social Sciences, and 1% in the college of Fine Arts. All participants were enrolled in an undergraduate general psychology course at the time of this study.

Internal Consistency of the Social Rhythm Metric

All of the previously published measures used in this study, with the exception of the Social Rhythm Metric (SRM), displayed internal consistency in the form of Cronbach's α reported in previous research. Thus, the first analysis conducted for this study was determining Cronbach's α for the SRM for this population. One-hundred and fourteen of the original 138 participants completed the SRM and so analysis for this statistic was completed on this larger population rather than on the 99 who had completed all three phases of the study. The obtained internal consistency of the SRM for this population, was found to be in the good range ($\alpha = 0.879$, $n = 114$).

Internet Use as a Predictor of Social Anxiety, Social Engagement, and Loneliness

This study hypothesized that the amount of time participants spent on the Internet would predict their reported loneliness, social anxiety and social engagement scores in both *offline settings* (e.g., face-to-face relationships) and in *online settings* (e.g., online relationships). Two separate linear regressions were performed to test the hypothesis, one testing this relationship between participant's loneliness, social anxiety and social engagement in *offline settings* and one testing the hypothesized relationship in *online settings.* The first model produced an R^2 of 0.040, $F(3,98) = 1.303$, $p = 0.278$ and did not support the hypothesis for *offline settings* since no relationship between time spent on the Internet and participants' scores on measures of social anxiety, social engagement or loneliness was produced. Table 1 reports the results of the first of these analyses.

Table 1

Time Spent on the Internet and its Influence on Social Engagement, Social Anxiety, and Loneliness with Face-to-Face Relationships

Measure	R^2	B	SE	B	p
	0.040				
SRM		0.142	0.255	0.57	0.578
BFNE-II: Offline Relationships		0.020	0.020	0.112	0.322
UCLA-3: Offline Relationships		0.024	0.023	0.116	0.302

The second linear regression similarily revealed no support for the hypothesis that participants' loneliness, social engagement and social anxiety in *online settings* was a function of the amount of time they spent on the Internet. This model produced an R^2 of 0.280, $F(2,98) = 1.393$, $p = 0.253$ and is displayed in Table 2.

Table 2

Time Spent on the Internet and its Influence on Social Anxiety, and Loneliness with Online Relationships

Measure	R^2	B	SE	B	p
	0.028				
BFNE-II: Online Relationships		0.021	0.021	0.107	0.301
UCLA-3: Online Relationships		0.021	0.020	0.109	0.293

These analyses indicated that amount of time spent on the Internet was not predictive of subjects' reported social anxiety, social engagement and loneliness in either offline or online settings.

Social Activity on the Internet as a Predictor of Social Anxiety, Social Engagement, and Loneliness

A second hypothesis forecast that social activity on the Internet would predict subjects' reported loneliness, social anxiety and social engagement in both *offline settings* and *online settings*. Two linear regressions were performed to test this hypothesis. The model testing the relationship in *offline settings* produced an R^2 of 0.043, $F(3,98) = 1.408$, $p = 0.245$, revealing no support for this prediction. The model is shown in Table 3.

Table 3

Social Activity on the Internet and its Influence on Social Engagement, Social Anxiety, and Loneliness with Face-to-Face Relationships

Measure	R^2	B	SE	B	p
	0.043				
SRM		-0.181	0.092	-0.199	0.053
BFNE-II: Offline Relationships		-0.003	0.007	-0.042	0.705
UCLA-3: Offline Relationships		-0.003	0.008	-0.034	0.763

A second regression testing this hypothesis for *online settings* was performed and similarily did not support this prediction. This model produced an R^2 of 0.190, $F(2,98) = 0.916$, $p = 0.404$ and is displayed in Table 4.

Table 4

Social Activity on the Internet and its Influence on Social Anxiety, and Loneliness with Online Relationships

Measure	R^2	B	SE	B	p
	0.019				
BFNE-II: Online Relationships		-0.002	0.007	-0.021	0.838
UCLA-3: Online Relationships		-0.009	0.007	-0.131	0.209

These analyses indicated that type of activity engaged in while on the Internet was not predictive of subjects' reported social anxiety, social engagement and loneliness in either offline or online settings.

Internet Use and Social Activity on the Internet as a Predictor of Depression

A series of linear regressions were used to investigate the relationship between depression, Internet use, and social activity on the Internet. The first regression was performed to predict participants' depression as a function of the *amount of time* they spent on the Internet. This model produced an R^2 of 0.007, $F(1,98) = 0.682$, $p = 0.411$ and. A second linear regression was performed to predict participants' depression as a function of the *type of activities* in which they engaged while using the Internet. This model produced an R^2 of 0.002, $F(1,98) = 0.198$, $p = 0.657$. Neither analysis supported the hypotheses that time or activity were linked to participants' scores on a measure of their reported depression. Both models can be found on the following page in Table 5.

Table 5

Depression, Internet Use, and Types of Activities Engaged in Online

Predictor	R^2	B	SE	B	p
Internet Use (time spent online)	0.007	0.338	0.409	0.084	0.411
Internet Activity (social v. non-social)	0.002	0.504	1.131	0.045	0.657

Gender Effects on Internet Use, Social Activity and Depression

A series of one-way between groups analyses of variance were performed to detect if the sex of the participant influenced the amount of time individuals spent on the Internet, the amount of social activity individuals engaged in on the Internet, and the level of depression individuals reported during Phase One of the study. As shown in Table 6, these analyses of variance showed no effect of sex on the amount of time spent on the Internet, $F(1,98) = 0.080$, $p = 0.778$ or the amount of social activity engaged in on the Internet, $F(1,98) = 0.510$, $p = 0.477$ and sex of participant did not significantly impact the level of depression reported $F(1,98) = 3.561$, $p = 0.062$.

Table 6

Influence of Gender on Internet Use, Social Activity Online, and Depression

Variable	Group	SS	df	MS	F	p
Daily Internet Use	Between Groups	0.424	1	0.424	0.080	0.778
	Within Groups	516.369	97	5.323		
	Total	516.793	98			
Social Interaction Online	Between Groups	0.355	1	0.355	0.510	0.477
	Within Groups	67.484	97	0.696		
	Total	67.838	98			
Depression (CES-D)	Between Groups	298.675	1	298.675	3.561	0.062
	Within Groups	8135.164	97	83.868		
	Total	8433.838	98			

Perception of Loneliness and Social Anxiety with Face-to-Face and Online Relationships

After preliminary analysis, additional analysis was done to detect differences between participants' perception of loneliness and social anxiety within *face-to-face*relationships and their perception of loneliness and social anxiety within online relationships. Table 7 includes the means for participants responses on the social anxiety and loneliness measures for both offline and online relationships.

Table 7

Means of Responses for Loneliness and Social Anxiety Measures

Measure	Relationship Type	Mean	SD	SE
Social Anxiety (BFNE-II)	Offline	21.26	12.811	1.288
	Online	13.19	11.485	1.154
Loneliness (UCLA)	Offline	37.37	11.109	1.116
	Online	39.05	11.807	1.187

A paired-samples t-test was conducted to compare loneliness in *Offline*relationships and loneliness in online relationships. No significant differences in the scores for face-to-facerelationships and online relationships, $t(98) = -1.827$, $p = 0.071$, were found. This indicates that participants did not perceive a difference in their feelings of loneliness based on the type of relationships (e.g., offline v. online) with whom they were interacting. A paired-samples t-test was also conducted to compare social anxiety in face-to-face relationships and social anxiety in online relationships. A significant difference between scores for offline relationships and online relationships, $t(98) = 7.319$, $p < 0.001$, was found.This indicates that participants

perceived significantly more social anxiety when interacting with each others in face-to-face relationships than when socializing in online formats. Results from both the social anxiety and loneliness paired sample t-tests can be found in table 8.

Table 8

Paired Samples T-Tests for Social Anxiety and Loneliness Measures

Measure	t	df	P
Social Anxiety (BFNE-II)	7.319	98	0.000
Loneliness (UCLA)	-1.827	98	0.071

Comparison of Estimated Internet Usage with Actual Usage

Participants were asked in Phase Three to estimate the amount of time they spent online. This estimation was then compared with the amount of time they had entered each day to determine if there were any significant differences between their estimated use and their actual use. Means of the average amount of time spent daily on the Internet can be found in Table 9. No significant differences were found between participant's estimated use of the Internet and their actual use as tracked on the daily self-report measure, $t(98) = 1.424$, $p = 0.157$. This indicates that the self-report measure of time spent online was not significantly different from the amount of time that participants perceive they are using the Internet. Additionally, this indicates the time participants spent on the Internet was not significantly impacted by having participants track their time in one hour segments.

Table 9

Means of Participant Time Spent Online

	Mean	N	SD	SE
Estimated Daily Hours	4.491	99	4.733	0.476
Tracked Daily Hours	3.911	99	2.296	0.230

Summary of Results

Overall the analyses uses to test the three primary hypotheses did not lend support to the predictions as expected. No significant results were found for predicting scores on the measures of social engagement, social anxiety, or depression based on time spent on the Internet or amount of social activity engaged in while online. There was, however, the significant finding that participants' reported greater levels of social anxiety when referencing to their face-to-face relationships as opposed to their online relationships even though the time and activity online did not impact their overall level of social anxiety.

CHAPTER 5

DISCUSSION

The intention of this study was to clarify discrepant portrayals of Internet use for social interaction by exploring the impact of Internet use on social engagement in *offline* and *online settings* in a college-aged population with particular attention to symptoms of social anxiety and depression. Sixty-eight female and 31 male undergraduate college students spanning 43 different majors served as participants in this study.

Gender Differences and the Internet

Previous research reported differences in the way the gender of participants influenced ones interactions with the Internet (Neu, 2009, Ybarra, 2004). Based on this literature, it was hypothesized that the sex of the participant would result in a difference in either the amount of time spent on the Internet or in the types of activities (e.g., social or non-social) in which they engaged while online. It was also hypothesized that males that spent more time on the Internet would report higher levels of depression than would females. Contrary to this hypothesis, in depth analysis found no differences detected in the amount of time spent on the Internet, the type of activities accessed while online, or reported levels of depression between male and female participants. However, it's important to note that although the researcher attempted to have an equal number of male and female participants, an overwhelming majority of the participants were female. The fact that a focus was placed on having an equal number of male and female participants and the sample still was disproportionately female may allude to some effects for gender that are not

visible and thus not measureable. It is hypothesized that men declined to participate in this study because of the open nature of what was being measured and they did not want to report the types of activities they engage in online. Due to the low number of male participants it is possible that differences exist that were not able to be detected by these analyses as a result of the subsequent low statistical power.

Social Engagement and the Internet

This study defined social engagement as the quality and quantity of interactions that an individual had with others on a daily basis. Previous literature reported mixed results that indicated that the amount of Internet usage was linked with both increases and decreases in face-to-face social interaction (Anderson, 2001; Campbell et al., 2006; Kraut et al., 1998; Kraut et al., 2002; Madell & Muncer, 2007; Sanders et al., 2000; and Shaw & Gant, 2002). Whereas popular media articles frequently focus on a perceived negative effect of Internet usage in face-to-face social interactions (Geldof, 2007; Grossman, 2008 and USA Today, 2007).

Based on this review of both the psychological literature and the popular media, it was hypothesized that either the amount of time spent on the Internet or the amount of social interaction engaged in while online could be used to predict loneliness and social interaction in *offline settings* (i.e., face-to-face relationships) and in *online settings* (i.e., online relationships). Results suggest that neither the amount of time spent on the Internet nor the amount of social activity engaged in while online were predictive of participants' scores on measures of social engagement and loneliness in *offline*and *online settings*. This lack of a statistically significant result should not be dismissed because it helps to build on the previous literature that use of

the Internet is not going to result in individuals who are less socially engaged with their day-to-day lives.

After investigating the primary hypothesis concerning social engagement and the Internet, an additional analysis was completed to look at potential differences in participants' perceptions of loneliness for face-to-face social engagement settings and online social engagement settings (e.g., online relationships). The primary reason for conducting this analysis was to investigate if the frequently negative conception of the Internet's effect on social engagement in the popular media is related to the intuitive perception of individuals. Previous research has shown that individuals will overlook information that does not fit with their intuitive sense of how things should occur particularly if they are already confident that the information should fit in a particular "intuitive" way (Simmons & Nelson, 2006). With this in mind, participants scores on the loneliness measure for face-to-facerelationships and online relationships were compared to look for apparent differences in their perception of loneliness. Contrary to popular media accounts of social engagement and the Internet, there were no apparent differences in the respondent's perception of the loneliness aspect of social engagement for these seemingly disparate relationships. Thus is can be hypothesized that when the popular media refers to the negative impact of the Internet on social engagement they are not referring to the loneliness aspects of social engagement.

Social Anxiety and the Internet

This study used the traditional definition of social anxiety as defined by the Diagnostic and Statistical Manual, fourth edition, text revision (American Psychiatric

Association, 2000). The psychological literature on social anxiety and the Internet (Campbell et al., 2006; Madell & Muncer, 2006; Neu, 2009) contradicted the popular perception that socially anxious individuals were more likely to use the Internet for interpersonal interactions (Ayushveda, 2008; Cuncic, 2009; Sorryforsilence, 2009).

Based on the review of both the psychological literature and the popular media accounts of social anxiety, it was hypothesized that either the amount of time spent online or the amount of social interaction engaged in while online could be used to predict levels of social anxiety. This study confirmed previous findings in the psychological literature that neither the amount of time spent on the Internet nor the amount of social activity engaged in while online was predictive of the level of social anxiety reported by participants when interacting with both *offline* and *online* relationships.

After the analysis of the primary hypothesis was completed and found to not be significantly significant, additional analysis was completed in order to investigate the potential differences in participants' perceptions of social anxiety while engaging with the Internet. As stated previously, previous research had shown that individuals were more likely to overlook information that is counterintuitive based on their own level of confidence in the erroneous information (Simmons & Nelson, 2006) and it was theorized that this may account for some of the discrepancy between the psychological literature and the popular media. Unlike with the loneliness analysis, the additional analysis on the participants' perceptions when they were asked to respond to questions measuring social anxiety showed that they were more likely to perceive differences in their social anxiety level when asked to focus on *offline*

relationships versus *online* relationships. This discrepancy in participants' perceptions of social anxiety may contribute to the popular media accounts that assume a link between higher levels of social anxiety when socializing in face-to-face situations and higher levels of comfort when socializing while using the Internet to communicate.

Depression and the Internet

For the purpose of this study, the American Psychiatric Association definiton of depression was used, defining it as a depressed mood most of the day with anhedonia, changes in appetite, and feelings of worthlessness and guilt (American Psychiatric Association, 2000). Previous studies investigating the association between the Internet and levels of depression found that the link between depression and the Internet was convoluted with gender (Ybarra, 2004), type of activity engaged in online (Morgan & Cotton, 2003), and the amount of time spent on the Internet (Campbell et al., 2006), with all aspects being implicated in levels of depression among users of the Internet. Other studies found no correlation between the Internet and depression (Kraut et al., 2002; Sanders et al., 2000).

Using this review of the literature, it was hypothesized that the amount of time spent on the Internet, the amount of social activity engaged in while online, or the gender of the participant may be predictive of levels of depression. However, similar to the Kraut and Sanders studies, this study also found that the amount of time spent on the Internet, the type of activity engaged in while online (e.g., social versus non-social), and/or the gender of the participants were not predictive of reported levels of depression.

CHAPTER 6

CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

This study was intended to clarify the psychological literature concerning use of the Internet and its effect on social engagement in a college-aged population with particular attention to levels of social anxiety and depression. Thorough investigation of three primary questions revealed no correlation between the *amount of time* spent on the Internet and levels of social engagement, social anxiety and depression in either *offline* (e.g., face-to-face) relationships or *online* relationships. Additionally, no correlation between the *type of activity* engaged in while on the Internet and levels of social engagement, social anxiety, or depression in *offline* or *online* relationships was found in the current study. One finding of note was that the *perception* of social anxiety decreased for participants when asked to answer for online relationships, even though their actual levels of social anxiety were still not significantly influenced by Internet use.

The seeming implication of this study is that the Internet, like so many other aspects of daily life, is merely a tool that individuals access and use in ways that they can choose. The amount of social engagement in which a person engages, both on- and offline is not sigificantly influenced by this tool, nor is their reported levels of depression symptoms or social anxiety.

There are several limitations to the findings of this study that must be considered. First, the population at the rural university where this study was conducted is 87% White, non-hispanic (IUP, 2010), and thus the sample can be assumed to have been disproporiately White. This assumption is made because

ethnicity was inadvertently absent in the demographic questionnaire this study used. This prevented exploration of differences based on ethnicity and represents a limitation for generalizing the results of this study to non-White populations. Collection of this variable would benefit furture investigations of this topic.

A second and commom limitation is the analog nature of the current study. Although pariticpants were asked to enter their Internet use and social engagement into a computer database each evening, they were still required to manually keep track and enter their self-report. Due to the nature of self-report it is possible that the data entered is not as accurate as it would be if their usage had been tracked digitally. Future studies would benefit from gaining permission from participants to install a computer tracking program to automatically gather the information needed.

The third major limitation of this study is the age group that was tracked. Although the reason behind focusing this particular study on college students was due to the fact that this population is assumed to have more access to the Internet as a part of their daily lives for the majority of their lives, it is possible that different results regarding the predictive nature of Internet usage would have been found in older populations. Future research would benefit from exploring the hypothesized links of this study across both ethnicity and the lifespan.

The last major limitation is that the population of this study was disproportionately female despite investigator efforts to obtain equal representation of sex across participants and thus it is possible that the lack of significant gender effects was due to this discrepancy. Future studies would benefit from using a population with equally distributed sex in order to explore or rule out any potential effects due to

the sex or gender of the standard Internet user. Perhaps future studies would benefit by masking the study to help prevent reactivity effects, and thus encourage more individuals of all genders to participate.

This study confirmed what previous psychological studies have alluded to, and what the popular media has appeared to deny: the Internet is a valuable tool that individuals use on a daily basis in order to access information concerning the world around them. It appears that this tool does not significantly increase a person's reported levels of depression, social engagement, or social anxiety. However, one finding that has not been seen in other studies is that although the Internet does not change a person's actual level of social anxiety, it may decrease their perception of social anxiety when interacting online. Future studies would benefit from continuing to explore this difference between the individual's perceived and actual levels of social anxiety to determine what, if any, aspect of individual's online relationships help. Specifically, more research needs to be done looking at both online and offline relationships in all aspects of mental health and across all ethnicities and ages. Additionally, with the rate that the Internet, and all aspects of social media are expanding, it would be beneficial to have participants rate their activities online in terms of how social they consider each activity. For example, one person playing chess online may find the interaction to be highly social while another individual may find it to be a solitary activity. This perception of social interaction online would be a rich area to explore in future research.

Thus, contrary to the original hypotheses of this study, the Internet is simply a tool that can be used to broaden a person's experience of the world in any way that

they see fit. The Internet puts the world at a person's fingertips, and in the United States, is theoretically the type of tool that any individual can access regardless of their socio-economic-status, ethnicity, class standing or geographic location.

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APPENDIX A

Informed Consent

Clinical Psychology Doctoral Program
Psychology Department
Uhler Hall, Room 201 / 1020 Oakland Avenue
Indiana, Pennsylvania 15705-1064
724-357-4519 (office) 724-357-4519 (fax)

Informed Consent

You are invited to participate in this research study. The following information is provided in order to help you make an informed decision about whether or not to participate in this study. If you have any questions please do not hesitate to ask via the provided researcher email listed below. You are eligible to participate because you are an undergraduate at Indiana University of Pennsylvania and enrolled in PSYC 101 General Psychology.

The purpose of this study is to learn about college students' habits when using the Internet and the impact that it may have on social relationships and psychological well-being. This study is particularly interested in looking at the amount of time you spend on the Internet per week and the particular activities you engage in while on the Internet. In an effort to get a complete picture of respondents, some demographic information is included for this study. Several questionnaires include items of a personal nature related to feelings of loneliness, depression and anxiety. It is estimated that completion of questionnaires will take one hour at the initial interview and an additional 15 minutes each night for a period of 7 days for no longer than a total commitment of 3 hours. Your completed participation in this study will earn 4 of the 6 points required to complete your research participation in your PSYC 101 course.

Your participation in this study is voluntary. You may choose not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators, with IUP, or your psychology professor. If you choose not to participate, your name will be returned to the subject pool and your research participation obligation will remain the same. If you choose to participate you may withdraw at any time by notifying the researcher. Upon your request to withdraw, all information pertaining to you will be destroyed. If you choose to participate, all information will be held in strict confidence. Your responses will be considered only in combination with those from other participants. The information obtained in this study may be published in scientific journals or presented at scientific meetings but your identity will always be kept strictly confidential.

This research is sponsored by Indiana University of Pennsylvania's Department of Psychology. If you have any questions, please contact the researchers listed below:

Primary Researcher:
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If you are willing to participate in this study, please sign the statement below. If you choose not to participate, please inform the researcher now.

I have read the above information and understand that participation in this study is voluntary. I agree to be a part of this research.

_____ _____

Signature of Participant Date

APPENDIX B

Demographic Questionnaire

Where do you currently reside?

_____ On campus in student housing

_____ Off campus in student housing

_____ Off campus with family

_____ Off campus with friends

_____ Off campus alone

_____ Other: _____

Do you own a personal computer?

_____ yes

_____ no

Where do you have Internet access (check all that apply)?

_____ On campus

_____ At home

_____ At parent's house

_____ At work

_____ Other: _____

What are the 3 most important activities you use the Internet for?

(1) _____

(2) _____

(3) _____

What is your current college major (s)?

(1) _____

(2) _____

Have you declared a minor?

_____ Yes, if yes, in what field: _____

_____ No

What is your current academic standing?

_____ Freshman

_____ Sophomore

_____ Junior

_____ Senior

_____ Continuing Education

What is your gender?

_____ Male

_____ Female

What is your mother's highest level of education?

_____ Did not complete high school

_____ High school

_____ Vocational or trade school

_____ Some college

_____ Bachelor's degree

_____ Masters degree

_____ Doctorate degree

What is your father's highest level of education?

_____ Did not complete high school

_____ High school

_____ Vocational or trade school

_____ Some college

_____ Bachelor's degree

_____ Masters degree

_____ Doctorate degree

What is your family's estimated total income?

_____ less than $7,550

_____ between $7,550 and $30,650

_____ between $30,650 and $61,850

_____ between $61,850 and $94,225

_____ between $94,225 and $168,275

_____ over $168,275

APPENDIX C

Part One: Internet Usage Tracking Chart

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight – 1 am	❑	❑	❑	❑	❑	❑	❑
1 am – 2 am	❑	❑	❑	❑	❑	❑	❑
2 am – 3 am	❑	❑	❑	❑	❑	❑	❑
3 am – 4 am	❑	❑	❑	❑	❑	❑	❑
4 am – 5 am	❑	❑	❑	❑	❑	❑	❑
5 am – 6 am	❑	❑	❑	❑	❑	❑	❑
6 am – 7 am	❑	❑	❑	❑	❑	❑	❑
7 am – 8 am	❑	❑	❑	❑	❑	❑	❑
8 am – 9 am	❑	❑	❑	❑	❑	❑	❑
9 am – 10 am	❑	❑	❑	❑	❑	❑	❑
10 am – 11 am	❑	❑	❑	❑	❑	❑	❑
11 am – 12 pm	❑	❑	❑	❑	❑	❑	❑
12 pm – 1 pm	❑	❑	❑	❑	❑	❑	❑
1 pm – 2 pm	❑	❑	❑	❑	❑	❑	❑
2 pm – 3 pm	❑	❑	❑	❑	❑	❑	❑
3 pm – 4 pm	❑	❑	❑	❑	❑	❑	❑
4 pm – 5 pm	❑	❑	❑	❑	❑	❑	❑
5 pm – 6 pm	❑	❑	❑	❑	❑	❑	❑
6 pm – 7 pm	❑	❑	❑	❑	❑	❑	❑
7 pm – 8 pm	❑	❑	❑	❑	❑	❑	❑
8 pm – 9 pm	❑	❑	❑	❑	❑	❑	❑
9 pm – 10 pm	❑	❑	❑	❑	❑	❑	❑
10 pm – 11 pm	❑	❑	❑	❑	❑	❑	❑
11 pm – Midnight	❑	❑	❑	❑	❑	❑	❑

Scoring: Total amount of hours per day, divided by number of days = average amount per day online.

Part Two: Internet Usage Follow-up Questions

How many hours per week do you spend studying? _____

How many courses have you taken that require Internet use? _____

How many total hours per week do you spend using the Internet? _____

How many hours per week do you use the Internet for school related work? _____

How many hours per week do you use the Internet for emailing? _____

How many hours per week do you use the Internet for instant messaging? _____

How many hours per week do you spend in Internet chat rooms? _____

How many hours per week do you spend browsing Internet sites? _____

How many hours per week do you use the Internet for gaming? _____

How many hours per week do you use the Internet for blogging or on social networking sites (Facebook, MySpace, etc.)? _____

Please rank-order these Internet activities from most likely to be what you do online to least likely:

_____ Email

_____ Research for school

_____ WebCT / Online Course

_____ Research for personal knowledge

_____ Sex sites

_____ Chat

_____ Shopping

_____ Researching items for purchasing

_____ News

_____ Games

_____ Music

_____ Blogs / Social networking sites

_____ Gambling

APPENDIX D

Social Rhythm Metric

Activity	Check if Did not do	Time: Clock time	Time: AM	Time: PM	Check if Alone	People 1=just present 2= actively involved: Spouse / partner	Children	Other family members	Other person(s)
Out of bed	❑	_____	❑	❑	❑	☐	☐	☐	☐
First contact (in person or by phone) with another person	❑	_____	❑	❑	❑	☐	☐	☐	☐
Have morning beverage	❑	_____	❑	❑	❑	☐	☐	☐	☐
Have breakfast	❑	_____	❑	❑	❑	☐	☐	☐	☐
Go outside for the first time	❑	_____	❑	❑	❑	☐	☐	☐	☐
Start work, school, housework, volunteer activities, child or family care	❑	_____	❑	❑	❑	☐	☐	☐	☐
Have lunch	❑	_____	❑	❑	❑	☐	☐	☐	☐
Take an afternoon nap	❑	_____	❑	❑	❑	☐	☐	☐	☐
Have dinner	❑	_____	❑	❑	❑	☐	☐	☐	☐
Physical exercise	❑	_____	❑	❑	❑	☐	☐	☐	☐
Have an evening snack / drink	❑	_____	❑	❑	❑	☐	☐	☐	☐
Watch evening TV news program	❑	_____	❑	❑	❑	☐	☐	☐	☐
Watch another TV program	❑	_____	❑	❑	❑	☐	☐	☐	☐
Activity A	❑	_____	❑	❑	❑	☐	☐	☐	☐
Activity B	❑	_____	❑	❑	❑	☐	☐	☐	☐
Return home (last time)	❑	_____	❑	❑	❑	☐	☐	☐	☐
Go to bed	❑		❑	❑	❑	☐	☐	☐	☐

APPENDIX E

UCLA Loneliness Scale (Version 3)

The Following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described by writing a number in the space provided.

Here is an example: “How often do you feel happy?”

If you never felt happy, you would respond “never”; if you always feel happy, you would respond “always.”

	Never	Rarely	Sometimes	Often
1. How often do you feel that you are “in tune” with the people around you?	❑	❑	❑	❑
2. How often do you feel that you lack companionship?	❑	❑	❑	❑
3. How often do you feel that there is no one you can turn to?	❑	❑	❑	❑
4. How often do you feel alone?	❑	❑	❑	❑
5. How often do you feel part of a group of friends?	❑	❑	❑	❑
6. How often do you feel that you have a lot in common with the people around you?	❑	❑	❑	❑
7. How often do you feel that you are no longer close to anyone?	❑	❑	❑	❑
8. How often do you feel that your interests and ideas are not shared by those around you?	❑	❑	❑	❑
9. How often do you feel outgoing and friendly?	❑	❑	❑	❑
10. How often do you feel close to people?	❑	❑	❑	❑
11. How often do you feel left out?	❑	❑	❑	❑
12. How often do you feel that your relationships with others are not meaningful?	❑	❑	❑	❑
13. How often do you feel that no one really knows you well?	❑	❑	❑	❑
14. How often do you feel isolated from others?	❑	❑	❑	❑
15. How often do you feel that you can find companionship when you want it?	❑	❑	❑	❑
16. How often do you feel that there are people who really understand you?	❑	❑	❑	❑
17. How often do you feel shy?	❑	❑	❑	❑
18. How often do you feel that people are around you but not with you?	❑	❑	❑	❑
19. How often do you feel that there are people you can talk to?	❑	❑	❑	❑
20. How often do you feel that there are people you can turn to?	❑	❑	❑	❑

APPENDIX F

Center For Epidemiologic Studies Depression Scale (CES-D)

Below is a list of the ways you might have felt or behaved.
Please indicate how often you have felt this way during the past week:

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me	❑	❑	❑	❑
2. I did not feel like eating; my appetite was poor.	❑	❑	❑	❑
3. I felt that I could not shake off the blues even with help from my family or friends.	❑	❑	❑	❑
4. I felt I was just as good as other people.	❑	❑	❑	❑
5. I had trouble keeping my mind on what I was doing.	❑	❑	❑	❑
6. I felt depressed.	❑	❑	❑	❑
7. I felt that everything I did was an effort.	❑	❑	❑	❑
8. I felt hopeful about the future.	❑	❑	❑	❑
9. I thought my life had been a failure.	❑	❑	❑	❑
10. I felt fearful.	❑	❑	❑	❑
11. My sleep was restless.	❑	❑	❑	❑
12. I was happy.	❑	❑	❑	❑
13. I talked less than usual.	❑	❑	❑	❑
14. I felt lonely.	❑	❑	❑	❑
15. People were unfriendly.	❑	❑	❑	❑
16. I enjoyed life.	❑	❑	❑	❑
17. I had crying spells.	❑	❑	❑	❑
18. I felt sad.	❑	❑	❑	❑
19. I felt that people dislike me.	❑	❑	❑	❑
20. I could not get "going."	❑	❑	❑	❑

APPENDIX G

Brief Fear of Negative Evaluation, Revised (BFNE-II)

For the following statements please indicate how characteristic each is of you using the following rating scale

		Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
1.	I worry about what other people will think of me even when I know it doesn't make any difference	❑	❑	❑	❑	❑
2.	It bothers me when people form an unfavorable impression of me	❑	❑	❑	❑	❑
3.	I am frequently afraid of other people noticing my shortcomings	❑	❑	❑	❑	❑
4.	I worry about what kind of impression I make on people	❑	❑	❑	❑	❑
5.	I am afraid that people will find fault with me	❑	❑	❑	❑	❑
6.	I am afraid that others will not approve of me	❑	❑	❑	❑	❑
7.	I am concerned about other people's opinions of me	❑	❑	❑	❑	❑
8.	When I am talking to someone, I worry about what they may be thinking of me	❑	❑	❑	❑	❑
9.	I am usually worried about what kind of impression I make	❑	❑	❑	❑	❑
10.	If I know someone is judging me, it tends to bother me	❑	❑	❑	❑	❑
11.	Sometimes I think I am too concerned with what other people think of me	❑	❑	❑	❑	❑
12.	I often worry that I will say or do wrong things	❑	❑	❑	❑	❑

APPENDIX H

Debriefing

Clinical Psychology Doctoral Program
Psychology Department
Uhler Hall, Room 201 / 1020 Oakland Avenue
Indiana, Pennsylvania 15705-1064
724-357-4519 (office) 724-357-4519 (fax)

Debriefing

Thank you for participating in this research study. The Internet has become an integral part of Western society, with approximately 69.2% of the population of the United States using the Internet on a regular basis (Internet World Stats, 2007). This study was conducted with the purpose of learning about college students' habits when using the Internet and the impact that it may have on social relationships and psychological well-being of regular users of this medium. The connection between Internet use and social engagement, depression and social anxiety has received mixed results in both the popular media and the psychological research, an example of this can be found in the journal article *Internet Paradox Revisited* (Kraut et al., 2002). The study in which you participated is designed to more accurately track students' daily use of the Internet in terms of time spent on a variety of online activities in order to clarify links between use and psychological outcomes.

The responses that you gave will be considered only in combination with those from other participants in the study so that you cannot be personally identified. Although the information obtained in this study may be published in scientific journals or presented at scientific meetings, your identity will always be kept strictly confidential.

This research is sponsored by Indiana University of Pennsylvania's Department of Psychology. If you have any questions concerning this study, if you would like more examples of the mixed results found between popular media and the psychological research, or if you feel that you need to speak with a professional and would like a referral, please contact the primary researcher listed below:

Primary Researcher:
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APPENDIX I

Campus and Community Resources

Counseling / Psychotherapy Resources:

1. *IUP Counseling and Student Development Center*
   307 Pratt Hall (IUP campus)
   724.357.2621

2. *Crisis Intervention, Drug and Alcohol Counseling:*
   Open Door Counseling & Crisis Center
   334 Philadelphia Street
   Indiana, PA
   724.465.2605
   Suicide Hotline: 800.794.2112

3. *Indiana County Guidance Center*
   793 Old Route 119 Highway North
   Indiana, PA
   724.465.5576

4. *Center for Applied Psychology*
   Includes Stress & Habit Disorders Clinic, Child & Family Clinic, and Assessment Clinic
   210 Uhler Hall (IUP campus)
   724.357.6228

Domestic Violence or Rape Crisis:

1. *Alice Paul House*
   724.349.4444 or 800.435.7249

Child Abuse or Neglect:

1. *Indiana County Children and Youth Services*
   350 N. 4th Street
   Indiana, PA
   724.465.3895

Academic / Learning Difficulties:

1. *Tutorial Center*
   306 Pratt Hall (IUP campus)
   724.357.2159

2. *Advising and Testing / Disability Services*
   106 Pratt Hall (IUP campus)
   724.357.4067

3. *Learning Center*
   202 Pratt Hall (IUP campus)
   724.357.2727

Career Planning:

1. *Career Services*
   302 Pratt Hall (IUP campus)
   724.357.2235

Legal Services:

1. *Student Legal Services*
   936 Philadelphia Street
   Indiana, PA
   724.349.6020

Activities / Campus Events:

1. *Center for Student Life*
   Student Activities and Organizations
   102 Pratt Hall (IUP campus)
   724.357.2315

2. *Student Cooperative Association*
   Hadley Union (IUP campus)
   724.357.2590

Other Resources:

1. *Gay, Lesbian, Bisexual and Transgender Concerns*
   Dr. Rita Drapkin: safe-zone@iup.edu

2. *Interfaith Council*
   www.iup.edu/student dev/ministry.shtm