

THE PHENOMENOLOGY OF DISTRESS IN
THE ABSENCE OF ELECTRONIC
DEVICES AND ITS RELATIONSHIP WITH
OTHER TYPES OF DISTRESS

A Thesis Presented to the Faculty of
University of South Florida, Saint Petersburg
In Partial Fulfillment of the Requirements
for the USFSP Honors Program

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April, 2013

University Honors Program
University of South Florida
St. Petersburg, Florida

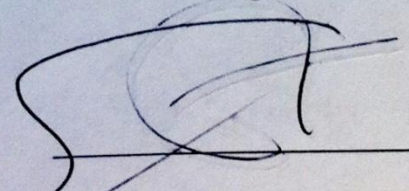
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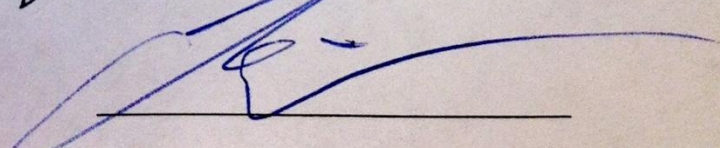
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TABLE OF CONTENTS

	PAGE
Abstract.....	3
Introduction.....	4
Methods.....	9
Participants.....	9
Materials	9
Procedures.....	12
Results.....	13
Discussion.....	15
References.....	18
Appendix: Figure 1	21
Appendix: Figure 2	23
Reflection.....	24

ABSTRACT

The recent surge in the availability of personal electronics is enabling more people to use them in their daily lives. Yet, many people experience some distress associated with using electronics, especially if they are unable to access or use their devices. This distress has not been adequately examined in previous studies and there is no existing research concerning whether distress without electronics (DWE) is related to other mental health issues. The objective of this study was to investigate the phenomenology of DWE within a non-clinical sample, as well as its association with other types of distress. A sample of 236 students completed a survey including the Sheehan Disability Scale modified to address DWE, Generalized Anxiety Disorder 7, Body Sensations Questionnaire, Agoraphobic Cognitions Questionnaire, Obsessive-Compulsive Inventory-Revised, Anxiety Sensitivity Inventory, UCLA Loneliness Scale, and the Distress without Electronics Questionnaire, which was developed for this study. The majority of participants reported experiencing some symptoms of DWE, especially when unable to use phones and computers. DWE was positively correlated with generalized anxiety, agoraphobic, and obsessive-compulsive symptoms, anxiety sensitivity, and loneliness. Implications and directions for future research are discussed.

INTRODUCTION

As technology is becoming more sophisticated and attainable, it is taking on a more significant role in people's lives. On a positive note, technology can create various opportunities and improve the efficiency and convenience of daily activities (e.g., global positioning systems can help people to easily find new locations, camera capacities that are now included within phones can allow people to take digital pictures and instantly share them, and the internet enables students to conduct research across numerous databases). However, people are becoming increasingly reliant on technology, which may lead to negative outcomes, such as distress associated with technology-use or with the inability to access it.

Evidence suggests that some people become dependent upon electronics. To study this, Shapira (2000) surveyed 20 participants who had been previously diagnosed with at least one DSM-IV-TR Axis 1 disorder and reported having an uncontrollable, markedly distressing, time-consuming dependence on the internet that resulted in social, occupation, or financial difficulties for at least six months. Subjects who reported technology dependence also reported significant social impairment (95.0%), marked personal distress (60.0%), vocational impairment (40.0%), financial impairment (40.0%) and legal problems (10.0%).

Kubey, Lavin, and Barrows (2006) surveyed 572 college students to further examine whether internet use impairs academic performance. They found that 9.3% of participants agreed with the statement "I might have become a little psychologically dependent on the internet." This subgroup reported spending three times more time using the internet recreationally than the remaining 90.7% of the sample, were more likely to report feeling that their internet use was sometimes out of control, and were four times as likely to agree that their schoolwork had been negatively impacted due to internet use.

Similarly, Aboujoude and colleagues (2006) administered a phone survey by making random-digit telephone calls to 2,513 adults who reported being regular internet users. Of those participants, 5.9% believed that their relationships suffered as a result of excessive internet use, 8.7% attempted to conceal non-essential internet use, 3.7% felt preoccupied when not on the internet, 13.7% found it hard to stay away from the internet for several days at a time, 8.2% utilized the internet as a way to escape problems or relieve negative mood, 12.3% had tried to cut back on internet use, and 12.4% stayed online longer than they intended either “often” or “very often.” Aboujoude and colleagues suggest that these factors related to internet use (social impairments, trying to hide use, feeling preoccupied when not using it, difficulty avoiding it, using it to escape problems or negative moods, trying to cut back, and using it longer than expected) could be used as criterion for diagnosing pathological internet use.

More recently, Gentile (2009) surveyed 1,178 youths ages 8 to 18 to investigate adolescents’ dependence on video games. Gentile found that 8.5% of video-game players spent twice as much time engaging in video games as other participants. These 8% had lower grades in school and were twice as likely to be diagnosed with attention problems. They were also more likely to report that they had played video games to escape from problems, skipped homework to play video games, done poorly on homework or a test because of playing video games, had problems paying attention in school, and feel “addicted” to video games.

Given that people can become dependent on electronic devices, it follows that some people may experience distress when they are unable to access those electronic devices. This distress without electronics (DWE) has not been adequately examined in previous studies. In addition, previous research used small sample or examined symptoms associated with a single device or system such as computers, the internet, or video games. Consequently, they may not

reflect the prevalence, severity, and impairment associated with DWE associated with all types of electronics within a non-clinical sample. The main purpose of studying DWE within a non-clinical sample is to determine “normal” levels of DWE to enable clinicians to more successfully identify pathology among their patients.

Additional information about DWE could be gained by studying its relation to other mental health issues. However, very little research has examined this. One type of distress that may proffer fruitful insights is generalized anxiety. Generalized anxiety is characterized by chronic, excessive worry that leads to physical symptoms of anxiety, attention difficulties, fatigue, and impairment in daily functioning (APA, 2000). These worries can be focused on a myriad of issues, such as electronics. Thus, DWE could be a subset of generalized anxiety.

Another type of distress that could relate to DWE is agoraphobia. Agoraphobia involves anxiety about being in a situation that would be difficult or embarrassing to escape. People with agoraphobia often worry about such situations, and when they cannot avoid them, they experience significant physical, mental, and emotional anxiety symptoms (APA, 2000). Agoraphobic cognitions include thoughts such as, “I am going crazy” and “I am going to act foolish,” and are accompanied by bodily sensations such as dizziness and nausea (Chambless, Caputo, Bright, & Gallagher, 1984). King and colleagues (2010) conducted a case study that led them to believe that using electronic devices might produce a sense of safety for people with agoraphobia. Additional research with a larger sample could investigate this idea.

Anxiety and worry are also major features of obsessive-compulsive disorder. People with obsessive-compulsive disorder experience persistent, intrusive thoughts that cause significant distress. They perform repetitive behaviors or mental acts to reduce that distress (APA, 2000). One major obsessive-compulsive category is checking, which involves the urge to check things

repetitively. Because many electronics contain features that could be checked repetitively, (such as the time on a mobile phone or social media updates on a computer), it is plausible that DWE could be related to obsessive-compulsive symptoms such as checking obsessions and compulsions.

Anxiety sensitivity is defined as “beliefs that anxiety experiences have negative implications” (Reiss, Peterson, Gursky, & McNally, 1986, pp. 1). For example, a person may notice that their heart is beating fast (due to anxiety), and become even more anxious because they believe that they will have a heart attack. Research has indicated anxiety sensitivity as a good predictor of agoraphobia and other anxiety disorders (Reiss, Peterson, Gursky, & McNally, 1986; Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004; Muris, Schmidt, Merckelbach, & Schouten, 2001). It could be helpful to measure the relationship between DWE and anxiety sensitivity in order to see if anxiety sensitivity could predict DWE.

Interestingly, loneliness appears to predict personal, social, and professional problems associated with excessive internet use such as getting in trouble at work, missing social engagements, feelings of worthlessness while offline (Caplan, 2002). However, the direction of this relationship is unclear. Loneliness could lead people to use electronic devices excessively as a substitution for human contact, and thus, experience more negative outcomes associated with DWE. Alternatively, experiencing negative outcomes of DWE may lead people to behave in a manner that drives others away, thereby leading them to feel lonely. Moreover, there could be a third factor (such as social anxiety) that could lead people to experience both negative outcomes of DWE and loneliness. Further research could clarify this relationship by measuring whether loneliness directly correlates with DWE—not just negative outcomes of DWE. This information

could provide an opportunity to gain further insight into the phenomenology of DWE, which can then assist researchers and therapists in developing measures and treatments for it.

The main purpose of this study is to investigate the prevalence, severity, and impairment associated with DWE in a non-clinical sample. This study also aims to measure the comorbidity of DWE with generalized anxiety, obsessive-compulsive symptoms, agoraphobic symptoms, anxiety sensitivity, and loneliness. Based on the prevalence of generalized anxiety (3.1%), obsessive-compulsive disorder (1.0%), and agoraphobia (.1%; Kessler, Chiu, Demler, & Walters, 2005), it is expected that DWE will be significant and impairing for over 2.0% of participants, and that DWE will positively correlate with generalized anxiety, obsessive-compulsive symptoms, agoraphobic symptoms, anxiety sensitivity, and loneliness.

METHODS

Participants

The sample included 236 undergraduate students from a southeastern university. Participants were recruited and participated in the study during a course session. They received course credit as an incentive for their participation. Students who were under 18 years old were not included because they could not provide consent. No other exclusion criteria were applied. No demographic information was collected to prevent identifiability of respondents.

Materials

Distress Without Electronics Questionnaire. The DWEQ is a 36-item self-report measure created for this study to examine the distress that people experience when they are not able to use electronic devices (see Table 1). This measure was constructed by pooling items, which were then reviewed by the co-investigator and other researchers. First, respondents are asked to report the prevalence of distress symptoms associated with not being able to use devices in the past six months. Items include physical symptoms such as “Accelerated heart beat, heart pounding,” mental symptoms such as “I worry that something bad might happen to myself,” emotional symptoms such as “I feel angry that I allowed myself to lose access to the device,” and other symptoms, such as “I feel bored.” Respondents can endorse these symptoms as occurring “Never,” “Seldom,” “Sometimes,” “Often,” or “Always.” Next, respondents are asked to report how much distress is associated with being unable to use each specific devices listed, which included cell phones, computers, music players, television/movie players, video game systems, global positioning systems, and electronic readers. Respondents can report that each device causes them to be “Not distressed,” “A little distressed,” “Somewhat distressed,” “Very distressed,” “Extremely distressed,” or they can report that this question is “Not applicable” to

them. Scores on the symptom items were added to produce a total symptom score. Scores for each type of symptom were also added to produce separate subscale totals.

Sheehan Disability Scale. The SDS (Sheehan, 1983) is a 5-item self-report measure of impairment. The first three items ask respondents to report how much their symptoms have impaired their work/school, social life, and family life/home responsibilities from zero to ten, with zero being “Not at all” and ten being “Extremely” impairing. The last two items ask respondents to report how many days were lost or unproductive due to the symptoms. The SDS has good internal consistency ($\alpha=.89$; Sheehan, 1983). It also shows good construct validity; patients with psychiatric disorders had significantly higher impairment scores, while nearly 50 percent of those with elevated SDS scores had at least one disorder (Leon, Olfson, Portera, Farber, Sheehan, 1997). Participants were instructed to complete SDS items according to DWE symptoms.

Generalized Anxiety Disorder 7-item. The GAD-7 (Spitzer, Kroenke, Williams, & Lowe, 2006) is a 7-item self-report measure for assessing generalized anxiety symptoms. It asks respondents to rate how much they experienced symptoms such as “Feeling nervous, anxious, or on edge” within the past two weeks from zero to three, with zero being “Not at all” and three being “Nearly every day.” The GAD-7 is scored by adding all items to produce a total score. The GAD-7 has good internal consistency ($\alpha=.89$) and reliability as well as criterion, construct, factorial, and procedural validity (Löwe, Decker, Müller, Brähler, Schellberg, Herzog, & Herzberg, 2008; Spitzer, et al., 2006).

Body Sensations Questionnaire. The BSQ (Chambless, Caputo, Bright, & Gallagher, 1984) is an 18-item self-report measure of concern about autonomic arousal associated with agoraphobia. It asks respondents to rate how frightened they are of bodily sensations such as

“heart palpitations” from one to five, with one being “Not at all” and five being “Extremely.”

The BSQ is scored by adding all scores and dividing the total number by 18 to produce a mean score. It has good test-retest reliability ($r=.79$), internal consistency ($\alpha=.87$), convergent validity, and divergent validity (Chambless et al., 1984).

Agoraphobic Cognitions Questionnaire. The Agoraphobic ACQ (Chambless, Caputo, Bright, & Gallagher, 1984) is a 15-item self-report measure of fearful cognitions related to agoraphobia symptoms. It asks respondents to rate how much they experience thoughts such as “I am going to throw up” when they are nervous from one to five, with one being “Thought never occurs” and five being “Thought always occurs.” The ACQ is scored by adding all items and then dividing the total by 15 to produce a mean score. It has acceptable test-retest reliability ($r=.79$) and internal consistency ($\alpha=.82$), and good reliability, construct validity, and discriminant validity (Chambless et al., 1984; Chambless, Beck, Gracely, & Grisham, 2000; Chambless & Gracely, 1989).

Obsessive-Compulsive Inventory-Revised. The OCI-R (Foa, Huppert, Leiberg, Langner, Kichic, Hajcak, & Salkovskis, 2002) is an 18-item self-report measure of obsessive-compulsive symptoms. It asks respondents to rate how much experiences, such as “I have saved up so many things that they get in the way,” have bothered them in the past month. These are rated from zero to four, with zero being “Not at all” and four being “Extremely” bothersome or distressful. OCI-R items are added to produce a total score. It has good internal consistency ($\alpha=.84$) and convergent validity (Huppert, 2007; Foa et al., 2002). Its six subscales have been found to have modest to adequate internal consistency: obsessing ($\alpha=.88$), washing ($\alpha=.69$), checking ($\alpha=.87$), neutralizing ($\alpha=.57$), ordering ($\alpha=.89$), hoarding ($\alpha=.93$; Huppert, 2007).

Anxiety Sensitivity Inventory. The ASI (Reiss, Peterson, Gursky, & McNally, 1986) is a 16-item self-report measure of beliefs about the social and somatic consequences of anxiety symptoms. It asks respondents to rate how much they agree with each thought, such as “It is important to me not to appear nervous” from zero to four, with zero being “Very little” and four being “Very much.” ASI items are added to produce a total score. It has shown to have good reliability, factorial independence from other anxiety measures, and sound psychometric properties (Peterson, 1987; Reiss, 1986).

UCLA Loneliness Scale. The UCLA Loneliness Scale (Version 3; Russell, 1994) is a 20-item self-report measure of loneliness. It asks respondents to rate how often they experience each feeling, such as “How often do you feel alone?” Items are rated from one to four, with one being “Never” and four being “Always.” The UCLA Loneliness Scale is scored by reversing scores on item numbers 1, 5, 6, 9, 10, 15, 16, 19, 20, and adding all scores. It has good reliability, internal consistency ($\alpha=.96$), concurrent validity, and discriminant validity (Russell, 1996; Durak, 2010).

Procedure

After receiving Institutional Review Board approval, the principle investigator distributed a survey to students in a course at a southeastern university. Students who completed the survey received extra credit toward their course grade. After participants completed the survey, responses were entered into a password-protected SPSS database. Frequencies were used to measure the prevalence, severity, and impairment relation to stress associated with not having access to electronics. Correlations were used to measure the relationships between stress without electronics and generalized anxiety, agoraphobia, and checking compulsions, as well as the predictive value of loneliness and anxiety sensitivity. T-tests were used to measure group differences between participants with higher levels of DWE and average levels of DWE.

RESULTS

The sample included 236 college students. On the DWEQ, all but one participant (99.6%) endorsed at least one physical, mental, and emotional symptom when unable to use an electronic device. Participants rated frequency of each symptom from 1 (“Never experienced in the last 6 months”) to 5 (“Always experienced within the last 6 months”). On average, participants experienced physical symptoms never ($M = 1.4$, $SD = .5$), mental symptoms seldom ($M = 2.3$, $SD = .9$), emotional symptoms seldom ($M = 2.0$, $SD = .9$), and other symptoms sometimes ($M = 3.0$, $SD = 1.2$). Participants reported experiencing the most distress (scores ranging 1-5, 1 being “not distressed” and 5 being “extremely distressed”) when unable to use cell phones ($M = 3.1$, $SD = 1.2$), computers ($M = 2.5$, $SD = 1.1$), global positioning systems ($M = 2.2$, $SD = 1.5$), and music players ($M = 2.1$, $SD = 1.2$). Items on the DWEQ demonstrated excellent internal consistency ($\alpha = .94$).

The SDS was used to assess impairment due to DWE. Disability was rated from 0 (“Not at all disruptive”) to 10 (“Extremely disruptive”). On average, participants reported DWE symptoms as being “more than mildly disruptive” to their school or work ($M = 3.0$, $SD = 2.7$), and social life ($M = 3.3$, $SD = 2.7$), and “mildly disruptive” to family life and home responsibilities ($M = 2.2$, $SD = 2.5$). Most participants (93.6%) reported losing no work days due to DWE, although 5.09% reported losing one to eight days of work due to DWE. Most participants (85.0%) reported experiencing no unproductive days due to DWE, although 6.4% reported experiencing one unproductive day, 5.6% reported experiencing two unproductive days, and 3.0% reported experiencing three to nine unproductive days due to DWE.

DWE symptoms were significantly positively correlated with scores on the GAD-7 ($n = 222$, $r = .5$, $p < .01$), ACQ ($n = 217$, $r = .4$, $p < .01$), BSQ ($n = 216$, $r = .4$, $p < .01$), OCI-R ($n =$

218, $r = .4$, $p < .01$), ASI ($n = 213$, $r = .4$, $p < .01$), and UCLA Loneliness Scale ($n = 212$, $r = .2$, $p < .01$). See Table 2 for additional details about correlations between DWE symptoms and other measures.

Scores on the DWEQ were positively skewed. Therefore, to further analyze the phenomenology of DWE among participants who reported it as a significant problem, DWE distress items and all SDS impairment items were summed to compute overall distress and impairment score. Next, participants who scored at least one standard deviation above the mean for distress ($M=.4$, $SD=.1$, cutoff: .5) and impairment ($M=2.8$, $SD=2.2$, cutoff: 5.1) were identified. There were 17 participants (7.2% of total participants) in this “high DWE” group. Then, t-tests were used to examine differences on other types of distress between participants with high DWE and other participants. The participants with high DWE scored significantly higher than other participants on the BSQ, $t(227)=3.5$, $p<.01$, ACQ, $t(228)=2.8$, $p<.01$, and ASI, $t(224)=3.9$, $p<.001$. There were no significant differences between groups on the GAD-7, $t(223)=1.8$, $p=.07$, OCI, $t(229)=.2$, $p=.04$, or UCLA Loneliness Scale, $t(225)=1.6$, $p=.11$.

DISCUSSION

This study aimed to investigate the prevalence, severity, and impairment of DWE symptoms in a non-clinical population, and to measure the relationship between DWE and other mental health issues. The current findings suggest that most people experience physical, mental, emotional, and other symptoms when they are unable to use particular electronic devices. For most people, these symptoms are mild and do not impair people's school/work, social, and family lives. This information could help therapists recognize whether their patients exhibit abnormally high levels of DWE, which may warrant clinical attention.

While most participants experienced DWE as only mildly distressing and impairing, 7.2% of participants reported more severe symptoms. This finding supports the hypothesis that more than 2.0% of participants experienced significant, impairing DWE. This prevalence rate suggests that DWE could be a significant emerging mental health concern that might merit further attention.

The second hypothesis was also supported; DWE was significantly positively correlated with several other types of distress. This indicates that some features of DWE may resemble those of other distress. For example, DWE and other anxiety disorders share physical symptoms such as accelerated heart rate and sweating, and the tendency to worry or feel preoccupied. Distress without electronics may also involve agoraphobic concerns of feeling that one cannot escape a fearful situation, and/or obsessive-compulsive concerns about what might happen if one is unable to perform certain rituals such as checking an email account. Correlations were all low to moderate with all types of distress measured, implying that DWE represents a distinct presentation of distress.

DWE had a moderate positive correlation with anxiety sensitivity, and a low positive correlation with loneliness. Thus, anxiety sensitivity and loneliness could be good predictors of DWE. Additional research could investigate this possibility by measuring anxiety sensitivity, loneliness, and DWE at different time points. Further research could also investigate whether there are other factors, such as stress management skills, might predict DWE.

A secondary finding was that the DWEQ demonstrated excellent internal consistency. This could indicate that items were not unique. Alternatively, this could suggest that the DWEQ could be a good starting point for establishing a standardized measure of DWE. Since the prevalence of personal electronics is likely to continue to grow, DWE may become a more significant issue within mental health. Thus, there may be a larger need for an instrument that can assess DWE for use in both treatment and research. Additional research could continue to evaluate the DWEQ by measuring its internal consistency with a different sample, comparing it to measures of distress associated with specific devices (such as the Internet Addiction Scale; Young, 1998), and studying its predictive validity.

While this study revealed interesting results, it should only be considered within its limitations. First, the main construct studied (DWE) was assessed by implementing a non-standardized measure—the DWEQ. We elected to create the DWEQ because no instrument existed that could measure distress that people experience when unable to use any particular electronic, (in contrast to measures of distress without a specific electronic). The symptoms scale demonstrated excellent internal consistency, but further reliability and validity testing is necessary to determine whether the DWEQ could be used in future research and clinical assessment.

Second, this study was also limited in that it utilized a college sample. Third, while no demographic information was collected, it is likely that this sample contained mostly very young adults. This is a particularly important consideration for DWE because the use of electronics may differ significantly between age groups and people of different socio-economic statuses. However, since very little research was previously conducted on DWE, we believe that these findings are still valuable for presenting some basic characteristics of DWE. We recommend that future research on DWE be conducted with samples that contain people of varying age groups and socio-economic statuses.

In sum, this study provides initial information about DWE, and the relationship between DWE and other mental health issues. Addressing this issue within therapy could benefit patients. In addition, we present an instrument that might be helpful for measuring DWE. Further research can build upon these results by using samples with more diverse age and socio-economic status, and by conducting more specific research on DWE and other types of distress. As electronics' place in daily functioning continues to expand, it is critical that mental health professionals strive to remain on the cusp of understanding how electronics influence mental health. This line of research can hopefully lead to improved treatment for a new era of mental health concerns.

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APPENDIX

Table 1. Distress Without Electronics Questionnaire

Distress without Electronics Questionnaire

Many people use electronic devices such as phones, computers, music players, video games, television, electronic readers, and locating devices. When they are unable to use one or more of these devices, some people become distressed (i.e., anxious, worried, fearful, or angry). This survey will ask questions about your thoughts and feelings regarding when you are unable to use electronic devices.

Which of the following have you experienced when you were unable to use an electronic device within the last six months? Indicate how often you experienced these feelings.

	Never	Seldom	Sometimes	Often	Always
<i>Physical sensations</i>					
Accelerated heart beat, heart pounding					
Face reddening or hot flashes					
Tightness of the chest, chest pain or pressure					
Numbness or tingling sensations of arms or legs					
Lightheadedness, dizziness or feelings of unsteadiness					
Shortness of breath or difficulty breathing					
Sweating					
Shaking or trembling					
Intense fear, panicky feelings, anxiety					
<i>Thoughts</i>					
I worry that something bad might happen to myself					
I worry that something bad might happen to someone else					
I worry that something bad might happen to the device (getting lost, stolen, or broken)					
I worry about others being unable to contact me					
I worry about missing important news					
I worry that I might get lost					
I am preoccupied with thoughts about how to complete tasks without the device					
I am preoccupied with thoughts about how I could have acted differently to be able to access the device					
<i>Emotions</i>					
I feel lonely					
I feel anxious and/or embarrassed because I feel unprepared					
I feel anxious because I cannot access certain information					
I feel stressed when I am not able to check on certain things on my device					
I feel uncomfortable communicating with friends, family, colleagues, etc. without my device (I prefer to avoid communicating face-to-face)					
I feel guilty for not contacting someone					
I feel guilty because I am unable to do work or other important tasks					
I feel angry that I allowed myself to lose access to the device					
I feel angry that someone else led me to lose access to the device					
I feel sad that I will not be able to use my device					
<i>Other</i>					
I feel bored					
I just don't feel "right"					

How distressed (anxious, worried, fearful, angry) do you feel when you are unable to use the following devices?

	Not distressed	A little distressed	Somewhat distressed	Very distressed	Extremely distressed	Not Applicable
Cell phone						
Computer (laptop, desktop)						
Music player (iPod, Zune, mp3 player, CD player)						
Television/movie player (VCR, DVD player, BluRay player)						
Video game system (Nintendo, Playstation, Wii, Xbox, Gameboy)						
Global positioning system (GPS)						
Electronic reader (e.g. Kindle, tablet)						

Table 2. Correlations between DWE Symptoms and Other Distress Measures

	Physical DWE Symptoms (n) r	Mental DWE Symptoms (n) r	Emotional DWE Symptoms (n) r	Other DWE Symptoms (n) r	Total DWE Symptoms (n) r
GAD-7	(236) .4**	(235) .4**	(224) .4**	(235) .4**	(222) .5**
BSQ	(227) .3**	(226) .4**	(216) .4**	(226) .2**	(216) .4**
ACQ	(228) .3**	(227) .4**	(217) .4**	(227) .3**	(217) .4**
OCI-R	(232) .3**	(231) .4**	(220) .4**	(231) .3**	(218) .4**
ASI	(224) .3**	(223) .3**	(213) .4**	(223) .3**	(213) .4**
UCLA Loneliness scale	(225) .1	(224) .1	(214) .2**	(224) .2**	(212) .2**

Note. * = $p < .05$, ** = $p < .01$

REFLECTION

Overview of Thesis Process

I began working on this project in January, 2012 and completed it in April, 2013. This project involved identifying a research area that I was interested in, reviewing existing literature to become familiar with gaps in research, thinking of an innovative research idea, contacting mentors, developing a measure, submitting a proposal to an institutional review board, collecting data, analyzing data, and presenting the results. In addition to this manuscript, this project was presented in a poster format at USF Health Research Day (February, 2013).

The most challenging aspect of this project was reviewing existing literature because research on this topic was sparse, scattered, and was conducted across several fields such as psychiatry, psychology, business, and economics. Another challenge was finding a way to collect data from a sufficient number of participants so that statistical analyses would be powerful. We initially planned to use a recruitment program through USF Tampa, but were denied access to the program. Instead, we recruited participants by asking students in a large class of students at USFSP to participate. The drawback to this approach was that it required us to print out the surveys and enter the data by hand instead of it being done automatically through an online system. However, recruiting participants in person enabled us to collect all data at one time point and move forward with analyses more quickly.

The most rewarding aspect of this project was talking about it with others. This included informal conversations as well as a presentation at a lab meeting and at the conference. Most people expressed a real interest in this project and commented that it related to their experiences. This may reflect the importance of this topic for further research.

What I Learned

I learned a great deal throughout this project. First, I learned an enormous amount of information about the topic itself while reading through various articles. For example, I learned about how different psychiatrists define addiction, how technology dependence disrupts business productivity, and techniques that manufacturers use to attract consumers toward electronics. Second, I learned more about the research process. For instance, I noticed how a phone survey that collected data from thousands of participants proffered a different set of results than a case study that involved more qualitative data. The former provided evidence for typical attitudes and behavior, while the latter gave insight into why particular attitudes and behavior might exist.

One of the most important things that I learned was how to develop a new measure. We started by reviewing measures of similar constructs (such as anxiety disorder and addiction). Next, we compiled a list of main factors that we wanted to assess. Then, we created an extensive list of questions designed to assess each factor. After that, we asked colleagues for opinions about what to combine, add, or delete. This process took a few months. The final version of the measure appeared to be valid and reliable, although additional research and modifications would be needed in order to determine whether it could be used as a standardized measure.

Finally, this process taught me valuable lessons about completing a large project. For example, I learned the importance of setting a timeline and deadlines for completing tasks in keeping myself moving forward. Admittedly, there were times when I did not follow these deadlines, and I wound up falling behind. Fortunately, I began the project early enough that I was able to catch up. Following this idea, I learned the value of beginning work on major projects as early as possible to allow for unforeseen setbacks. I will keep this experience in mind for future projects.

What Was Achieved

This primary goal of this project was to contribute knowledge to the scientific community. This goal was partially achieved in that the findings were shared at a poster conference and through this thesis. Unfortunately, our goal was not fully achieved because my mistake in data collection (not collecting demographic information) severely limited our ability to submit this manuscript for publication in a peer-reviewed journal. If I were to repeat this process, then I would ask for participants' age, gender, ethnicity, and socio-economic status within the survey. Nonetheless, I feel that I gained a substantial amount of knowledge and experience from completing this project, which I know will assist me in my future endeavors.